the Nansen LEGACY

Seasonal cruise Q3

Cruise Report

The Nansen Legacy Report Series 27/2022

Seasonal cruise Q3 2019
Cruise 2019706

RV Kronprins Haakon
Longyearbyen - Longyearbyen
August 5 - August 27, 2019

Authors:

Marit Reigstad
Tove Gabrielsen
Marti Amargant
Rita Amundsen
Bodil Bluhm
Yasemin Bodur
Jan Bremnes
Nadja Brun
Padmini Dalpadado
Kasia Dmoc
Bente Edvardsen
Jack Garnett
Christine Gawinski
Julia Giebichenstein
Ane Haarr
Siv Hoff
Eric Jorda
Konrad Karlsson
Stephen Kohler
Jon Leithe
Miriam Marquardt
Christian Morel
Oliver Müller
Håvard N. Liholt
Jan Vidar Nordstrand
Robynne Nowicki
Lasse Olsen
Griselda Anglada Ortiz
Ronald Pedersen
Nicolas Sanchez
Karoline Saubrekka
Arunima Sen
Leif Christian Stige
Angela Stippkugel
Anna Vader
Anette Wold
Fekadu Yadetie

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Summary

The Nansen Legacy Q3 cruise, 5-27 August 2019, initiated the seasonal investigations of the Nansen Legacy transect. The transect represent an environmental gradient going through the northern Barents Sea, and included 7 process stations (P1-P7) lasting 6-53 hrs. CTD stations were taken to increase the hydrographic resolution on the transect. The work started at 76°N at the open Atlantic Water dominated station P1, was sea ice covered from station P4 at 79°N, and included deep water stations at 82°N at P7 in the Nansen Basin.

The program included measurements and sampling from the atmosphere, sea ice, ocean and sea floor. Data collected ranged from physical observations, chemical, biological and geological data collection, and the aim was to link observations and measurements to improve our understanding of the systems involving both climate, human impacts and the ecosystems. An important task was to understand interactions both within the ecosystem, but also linked to the environment. Environmental descriptions linked to the Atlantic and Arctic shelf regimes and the deep Arctic Basin, and how the environmental conditions relate to both present days and potential future communities of organisms from virus and bacteria to fish, and their interactions and production, was therefore a core activity.

Deployment of moorings and gliders extended the observational capacity in time and space, outside the cruise period.

Introduction

Scientific goals and achievements

The RV Kronprins Haakon cruise Nansen Legacy seasonal Q3 (Q3= 3rd quarter of the year), initiated the seasonal investigation of the northern Barents Sea and adjacent Arctic Basin. This activity is a key milestone planned for the project.. The cruise addressed objectives of the research foci in RF1 on Physical drivers, RF2 on Human drivers and RF3 on the living Barents Sea, and collected necessary data along the Nansen Legacy transect in open waters and within the ice. Experiments were an important component of the research to quantify processes, rates and interactions that will also feed modeling work and projections in RF4. The ongoing establishment of routines for sampling, data management and data storing continued as part of the practical work onboard. The observational capacity was increased also outside the cruise periods, through deployment of 2 gliders for RF1, and 3 moorings in collaboration with RF1/2/3. Many of the cruise participants were new PhD and post docs, and represent a new generation Arctic scientists. To document the research activity for a broader communication of the research and results, a professional photographer has produced pictures and videos during the cruise.

Brief description of the activity

RV *Kronprins Haakon* left Longyearbyen on 5 August, 2019, in the afternoon, with a science team of 35 persons. The departure was delayed by ~1 day compared to the original plan due to a leakage around one propeller causing an unplanned stay in dock. Cruise participants without survival suit training carried out the necessary exercise close to the vessel in the harbor of Longyearbyen while the vessel was loaded. A monitoring station outside Longyearbyen, IsA, was sampled with one CTD to facilitate reference measurements prior to planned experiments onboard, and also served two collaboration projects. West of Sørkapp, Glider 1 was deployed to monitor the hydrographic structures in the Fram Strait across the AW inflow. Glider 2 was deployed close to our first Process station, P1 (Figure 1), in the Hopen deep south of the Polar Front at 76°N, on 7 August. This glider will patrol across the Polar Front between the Hopen

depth and the basin north west of Storbanken. Seven Process stations (P1-P7, Figure 1) was planned investigated along the Nansen Legacy transect established in 2018. The first process station (P1) was successfully finished on 9 August including experiments, after 37 hrs, as planned. Between the P stations, smaller CTD stations (NLEG 1-25) was distributed to get a higher resolution on hydrographical and biogeochemical parameters along the transect. The sampling program was set on hold on 9-10 of August due to an unforeseen need for spare parts necessary to go into the sea ice. These were brought to Hopen by helicopter and had to be picked up there. The incident made it possible to supply a researcher with lost filters. The window to get helicopter transport followed CTD problems caused by the combination of large waves and a light Kevlar line that was damaged, and NLEG 2-3 could not be sampled. CTD cable were fixed during transit to Hopen, but we had to proceed to P2 on Storbanken to catch up timewise.

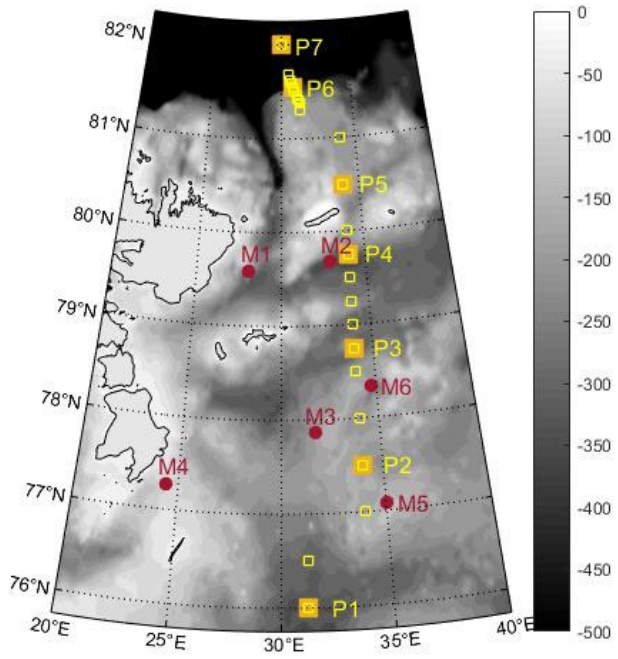


Figure 1. Station map for the Nansen Legacy seasonal Q3 cruise. Process stations P1-P7, intermediate CTD stations (NLEG), and mooring sites M1-M6 is shown. Moorings at M5 and M6 were deployed during the cruise.

The P2 station was sampled successfully on 11-12 August. A double mooring (M5) for physics and bioacoustics were deployed east of the P2 station prior to the station work. Another physical mooring (M6) was deployed further north, southeast of NLEG 6 to measure AW inflow to Storbanken. Due to time lost with late departure and the detour to Hopen, the sampling program at P3 was reduced to a 6 hrs biomass/ community sampling (including trawling), biogeochemistry and hydrography station. No experiments or process measurements were carried out. At Station P4 south of Kvitøya, we met the sea ice, but floes were relatively small, and the station was sampled with the full open water sampling program including experiments, on 13-15 August (30 hrs station). Trawling was carried out a few nautical miles south of the station in more open waters. Transit time between stations increased with the sea ice, but we kept about 5 knots and reached P5 north of Kvitøya on August 15. Ice floes were larger here, but due to time constrains and expected better ice conditions on the two northernmost stations no ice station was carried out here. Station P6 on the shelf break towards the Polar basin started on 17 August. A sea ice training course was held on our way to the P6 station, to prepare all participants for the work on and associated to the sea ice with respect to both sampling and safety. Ice floes were 100 m to > km in size, 1 to 1.5 m thick, and suitable for sea ice work. We completed a full ice station and open water program (except trawling). A sea

ice sampling program including ice cores, meltwater ponds and under-ice water was carried out during the first evening, to utilize good weather conditions. Teams of experienced and unexperienced scientists were composed to train a new generation of scientists in sea ice work (Table A1.4). The ice station was followed by a full ocean sampling program on August 18-19. A relatively soft sea ice cover of 1-1.5 m allowed efficient transit to the last process station P7, including all NLEG stations. A similar program to P6 was carried out at P7. To increase the number of observational sites and improve the datasets on sea ice and sea floor observations, one additional ice floe (SICE4, Table A1.1) was selected for a reduced coring program, including a deep CTD with water for standard parameters on 23 August, and 3 more box core samples were taken. The SICE4 station was located at 82°N, 24.34 E, with a depth of 3600 m (sea ice thickness ~1.5 m), to compensate for the slightly shallower box core sampling site at P7 caused by drift from 3280 m to 2500 m during the station period. The CTD cable turned out to be damaged around 3200 m (not known), so the CTD could not go to the sea floor. During transect back, a mulitbeam survey was carried out in the slope region (80°N, 12°E). Glider 1 was recovered again by KPH outside Isfjorden up-on return, due to poor data quality.

Along track measurements carried out during the cruise

RV Kronprins Haakon is equipped with several underway measurement systems to provide data along the cruise track.

Meteorological measurements from Vaisala AWS430 weather station

Air and sea temperature (8 m depth), air pressure, wind speed and direction, relative humidity and solar radiation is measured continuously by a Vaisala AWS430 weather station.

Thermosalinograph

Temperature, salinity, density and fluorescence is measured from the clean water intake at 4 m depth, and continuously logged from departure Longyearbyen. The clean water intake is sensitive to ice (filter get clogged) or water at freezing temperature (-1.7), so pumps shut down in shorter periods (station NLEG 12, P5, …) for ice removal. The alternative inlet at 9 m depth, is located in the sinking keel, that cannot be used in ice covered waters.

Ocean current measurements from ADCP 150 kHz

Currents in the upper ~500 m of the water column were continuously measured during the cruise using a 150 kHz ADCP (RDI Instruments) mounted on the drop keel. The setup followed the setup in the test cruise. The instrument was synchronized with the EK80 using K-sync. The 38 kHz ADCP was not used due to interference with the 38 kHz of the EK80. The ADCP data was not processed during the cruise due to time constraints.

pCO2 measurements

Using the 4 m sea water inlet, a pCO_2 underway system for autonomous high frequency surface water measurements provide data on pCO2 in sea water and air, dissolved O_2 and O_2 saturation and sea water temperature during the entire cruise (Figure 2). Same water-intake as thermosalinograph – and similar problems with ice at low temperatures.

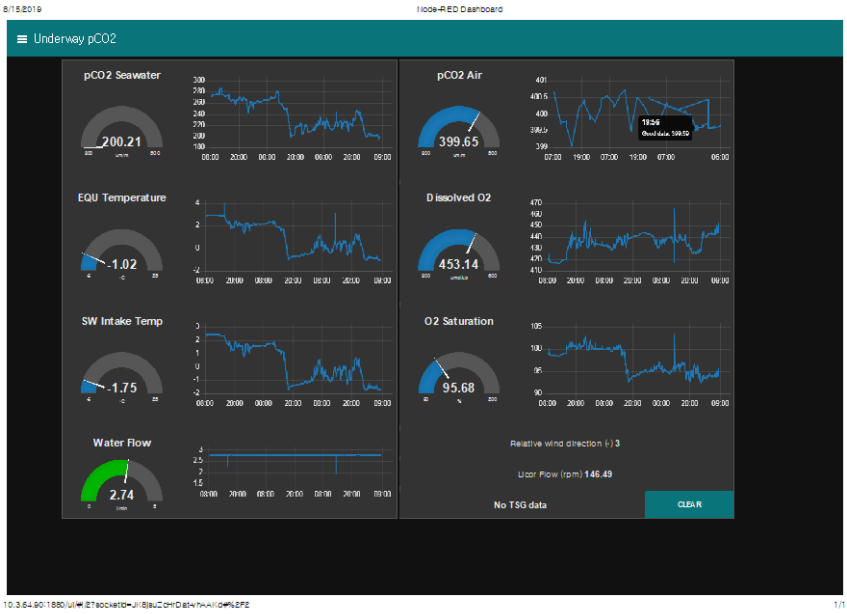


Figure 2. The pCO2 underway measurements measures relevant parameters on CO_2, temperature and O_2 from the 4 m sea water intake.

Acoustics measurements of zooplankton and fish with the vessel´s EK80

Acoustic surveying of fish and zooplankton was conducted using the six scientific Simrad EK80 echo sounders (18 kHz, 38 kHz, 70 kHz, 120 kHz, 200 kHz, 333 kHz split beam systems), all mounted on the drop keel. When going in sea ice the keel was retracted and the data collection were conducted with similar systems mounted in the Arctic tanks. The EK80 was operated in CW modus. Data were stored down to 1000 m depth, although electrical noise during transit prevented high-quality data below about 600 m depth.

Multi-frequency scrutinization and target strength analysis was conducted for the 38kHz data using Korona allocating NASC into the category's capelin, plankton, cod, herring, and others. The map below shows where scrutinized data were obtained (Figure 3).

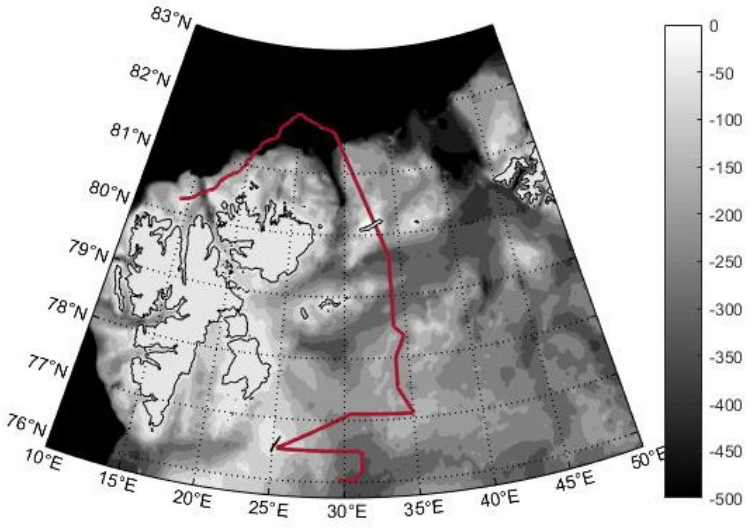


Figure 3. Cruise track illustrating where density estimation of several fish species and plankton has been obtained based on scrutinized 38 kHz data from EK80 and target strength analysis during the Q3 cruise 6-26 August 2019.

Acoustic registration of fish and plankton using TS probe

Detailed inspections at short range of interesting acoustic layers were made with an acoustic probe lowered in the water column. The specially designed probe has full wideband capacity and carries 4 EK80 echo sounders with 5 selectable transducers at 38,70, 120, 200 and 333 kHz. The probe was used in vertical mode, for target strength measurements of specific organisms. Target strength values are needed for several of the Arctic fish and zooplankton species to allow for accurate density estimation from the vessels-based systems. The probe was lowered from surface to the bottom (max 1000 m depth) at about 1 ms^{-1}. Full multi-frequency echograms were recorded during the profile. The TS probe was run on five stations.

Glider deployments

During the transit from Longyearbyen to the Nansen Legacy transect (Figure 1), 2 gliders was deployed for RF1 and Ilker Fer (UiB) to measure the hydrographic characteristics across the Atlantic Water inflow in the west Spitsbergen current, and across the Polar front, west of the Nansen Legacy transect. Glider 1 (SG560) was deployed west of Sørkapp on 6 August 2019 (Table 1). Glider 2 (SGF561) was deployed close to station P1, on 7 August, 2019.

Table 1. Overview of Glider deployments during Nansen Legacy Q3 seasonal cruise, August 2019.

Date	Time (UTC)	Glider ID	Glider name	Latitude	Longitude	Depth (m)
06.08.2019	09:54	SG560	Glider 1	76° 24.994263 N	13° 54.281974 E	1050
07.08.2019	13:42	SGF561	Glider 2	76° 00.310775 N	31° 02.073206 E	327

Both Gliders were successfully deployed, with reports of successful dives in the days after deployment. After a couple of weeks, Glider 1 failed, with poor data quality, and some days later also Glider 2 failed, due to problems of performance. Glider 2 was collected by KV Andenes, and Glider 1 was retrieved outside Isfjorden at the end of the cruise by KPH.

Mooring deployments

Three moorings were deployed during the survey. To study seasonal variability in temperature, salinity, currents and pH under Arctic conditions, one mooring containing a Signature 250 i 135 m depth, a Seabird SBE 37-SM Microcat in 133 m depth, a Signature 250 in 92 m, a Seabird SBE 37- SMP SeaPHox in 72 m depth, and with top buoy in 70 m depth, were deployed at 77° 04.516N, 35° 02.168E (southern part of Great Bank). To also study seasonal variations in zooplankton and fish appearance, another mooring containing a Signature 100 in 136 m depth were deployed close to the first mooring (at 77° 04.947, 35° 03.487 E). Both mooring locations are within a region closed for fishery.

A third mooring were deployed in the northern part of the Great Bank to study inflow of Atlantic Water on the bank. The location (78°20.868N, 34°45.744E) were chosen based on maps on fishery activity. The mooring contains a Nortek Continental in 230 m depth, a Seabird SBE 37-SM Microcat in 177 m depth, a Nortek Continental in 128 m depth, and have a top buoy in 76 m depth.

Station-based work

The Nansen Legacy transect (Fig. 1) provides a climatic gradient from the southern Atlantic influenced region of the Barents Sea (P1) across the more Arctic influenced northern shelf (P2-P5), and into the Arctic Basin (P7). The northern branch of the Atlantic Water Current into the Arctic Basin along the shelf break, is covered by the shelf break station (P6). This transect may also represent a space-for-time gradient. On a seasonal time-scale, ice-free waters in the south can reflect a later seasonal stage compared to the ice-covered regions in the north were sea-ice cover may delay the productive onset in the water column. At the same time, this may be compensated by an early ice algal production. On a longer timescale, the climatic conditions in the Barents Sea is strongly impacted by the warm and saline Atlantic Water inflow. With increased and extended Atlantic impact further north, an “atlantification”, characteristics of the southern end of the transect may represent elements of future conditions in the north.

NLEG stations

T1-1.2 Hydrographic characterisation
Tove Gabrielsen (UNIS/UiA), Marit Reigstad (UiT), PIs: Randi Ingvaldsen (IMR), Arild Sundfjord (NPI)

To increase the observational resolution along the transect, 18 additional CTD stations (NLEG1-25) reduce the gaps between the process stations (P1-P7). The overview of NLEG and P-stations are given in Table A1.2. A reduced biogeochemical sampling program was carried out on the NLEG stations.

All NLEG stations, with the exception of NLEG 2 and NLEG3 across the Polar Front, were covered in full depth with CTD, with T, S, O2, fluorescence and LADCP. The hydrographic characterization along the transect with respect to temperature, salinity and fluorescence, is shown in Figure 4. The watermass characteristics for the different P-stations, are illustrated in Figure 5.

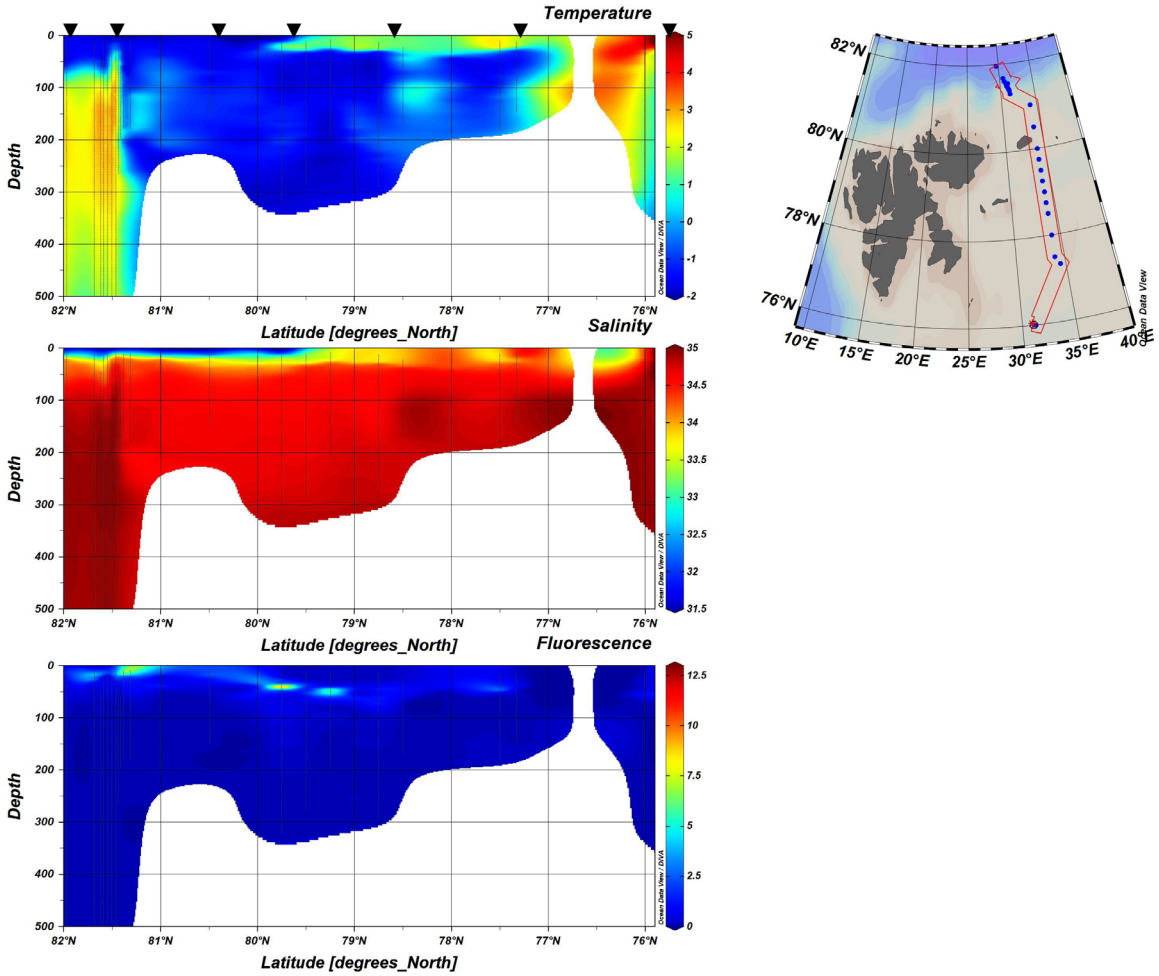


Figure 4. Temperature, salinity and fluorescence along the Nansen Legacy transect from 76 to 82°N in August 2019. The process stations P1-P7 (P1 to the south and right) are marked with black triangles on the upper figure. Data from 0-500 m is plotted here, but the full water column down to > 3000 m was sampled north of the shelf break.

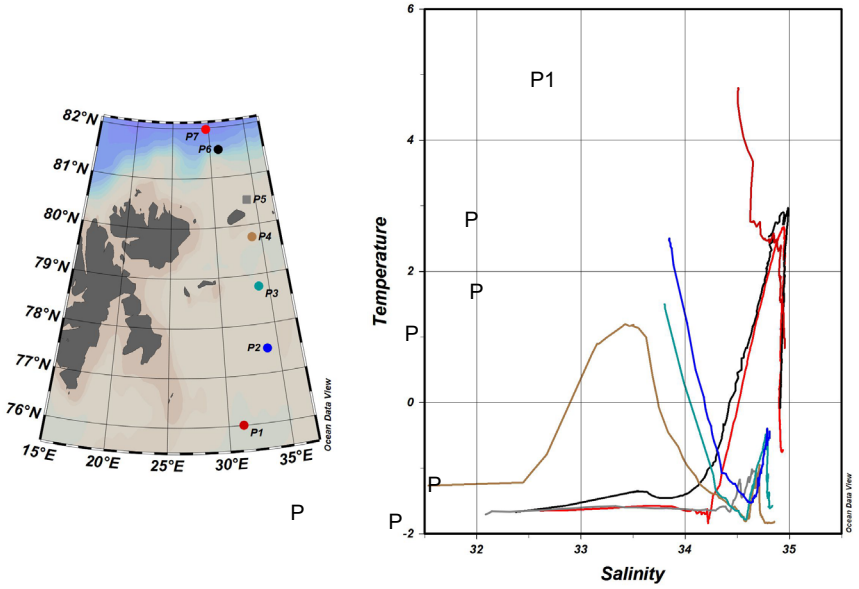


Figure 5. Temperature-salinity plot (TS diagram) illustrating the difference in water masses on the different process stations P1-P7, with reduced salinity and temperature moving northwards. Station P6

is located on the shelf break where the AW branch north of Svalbard goes. Colors correspond to station colors on the map (left).

Sensor deviations during the survey: Primary temperature sensor serial number 5647 was occasionally spiking from Local station 189, and got worse. Changed to sensor s/n 6298 from Local station 192. These correspond to 2-4 of in total 4 CTD casts at P7.
Too high values from O2 sensors on some of the stations.

T1-2.2 Sea ice
Jon Leite (NPI), Leif Christian Stige (UiO), Tove M. Gabrielsen (UNIS/UiA), Marit Reigstad (UiT), Padmini Dalpadado (IMR), Anna Vader (UNIS), PI: Sebastian Gerland (NPI)

Sea ice observations were carried out according to the recommendations from the Ice Watch Program. The sea ice conditions, characteristics and weather were registered every 6th hour from the bridge accompanied with photos. Data are uploaded and available at https://icewatch.met.no.

T2-1.1 Nutrients and DIC
Griselda Ortiz (CAGE-UiT), PI: Melissa Chierici, (IMR)

Nutrients and DIC was sampled at all NLEG stations. A total number of 225 water samples from the Niskin bottles have been collected in order to study each chemical parameter at 20 different stations at all standard depths. The sampling and chemical treatment (60 µm of mercuric chloride at the DIC/Alk samples and 200 µm of chloroform at the nutrients samples) were done following the protocol from the Nansen Legacy v4. All the samples were stored in the dark at 4-6° and sent to Institute of Marine Research (Melissa Chierici) and Norwegian Polar Institute (Agneta Fransson) for further analysis.

T3-1.1 Characterisation of microbial communities
Oliver Müller and Lasse Olsen, (UiB), PI: Bente Edvardsen (UiO)

Flow Cytometry samples were taken for the standard depths at ten of the NLEG stations (in addition to the P-stations) to quantify the abundance of bacteria, virus, pico- and nanoplankton by flow cytometry. The NLEG stations sampled were NLEG5, NLEG6, NLEG8, NLEG9, NLEG10, NLEG12, NLEG14, NLEG15, NLEG19, NLEG23, NLEG24.

Process stations

Research foci 1: Physical drivers

Atmospheric data were collected launching a radiosonde balloon at noon at all P stations. Ocean currents in the upper ~500 m of the water column were continuously measured, also during the P stations, using a 150 kHz ADCP (RDI Instruments) mounted on the drop keel. The setup followed the setup in the test cruise. The instrument was synchronized with the EK80 using K-sync. The 38 kHz ADCP was not used due to interference with the 38 kHz of the EK80. The ADCP data was not processed during the cruise due to time constraints.

An LADCP mounted on rosette were run on some selected stations. Problems with logging and downloading of data on P3 to P4 (Local stations 161-169), but worked again from NLEG12 (Local station 170) (Table A1.1). Problems were caused by a defect cable. CTD were operated from the side of the vessel from the start and including P1 (Local station 151). The remaining cruise from P2 (Local station 154) we had to operate the CTD rosette from the moonpool,

missing the upper 10 m. Compensating CTD casts using an SAIV sonde from UNIS from the side provided surface measurements. Technical problems with the main hydrography winch with wire (W03) required use of an alternative winch (W04) with Kevlar Cable from the side. This light weighted cable was damaged during use in waves, and we were forced to use the moonpool as a suboptimal but functional solution.

Sea ice observations supporting research in RF1, is included in a separate section on Sea Ice together with the chemical and biological parameters.

Research Foci 2: Human drivers

T2-1.1; 1.4. Current variability and drivers of ocean acidification (T2-1-1) and Ocean acidification effects on planktonic calcifiers and biological pump efficiency (T2-1-4)
Griselda Anglada-Ortiz (CAGE-UiT), PIs: Melissa Chierici (IMR), Tine Rasmussen (UiT)

To better understand the effects of ocean acidification on the Barents Sea, the abundance and carbonate contribution of different planktonic marine calcifiers (foraminifera, pteropods and coccolithophores) will be studied from 64 um multinet samples (foraminifera and pteropods) and water samples (coccolithophores) regarding the water chemistry (nutrients, $\delta^{18}O$ and DIC/Alkalinity) from the sampling zone.
A total number of 108 samples have been retrieved on 6 of the P stations to study these marine calcifiers (Table 2). On one hand, 52 samples have been collected using the 64 um multinet on the P stations at the standard depths 300-200m, 200-150m, 150-100m, 100-50m and 50-0m. Once on deck, a maximum of 120 specimens (60 foraminifera and 60 pteropods) have been picked from the 3 shallowest depths every 3 stations and freeze them individually at -80° C for protein extraction analysis. The rest of the samples have been stored on plastic bags and preserved at -20° C for further analysis on shore.
On the other hand, 28 samples coming from the P stations and different depths have been collected from the Niskin bottles. A total volume of 5 L was sampled at the different depths (200 m, 120 m, 50 m, chl max depth and 10 m) and filtered through a 0,45 um Acetate cellulose filter (volume= 2L) and 0,4 um Polycarbonate filter (volume= 3L). Once the samples have been filtered, the filters have been rinsed with distilled water buffered with ammonia and oven dried on the petridish at 60° C for at least 1 hour.
Once we are back, these samples will be analysed at CAGE-UiT (Tromsø) through [1] comparing the living species distribution with the pre-industrial distribution (from core samples retrieved during the Nansen Legacy cruise last September); [2] investigating the state of the shell of the living organisms regarding the carbonate chemistry of the water; [3] determining the dissolution index and [4] assessing the carbon fluxes generated by these living planktic marine calcifiers.

Table 2. Station overview of the water chemistry samples, and calcifying organisms collected.

Station name	Niskin DIC/ALK	Niskin $\delta^{18}O$	Niskin Nutrients	Niskin - Coccolitophores	Multinet 64 um - Foraminifera and pteropods
IsA st					
P1					*** picking**
P2					
NLEG5					
NLEG6					
P3					
NLEG8					
NLEG9					
P4					*** picking**
NLEG12					
P5					
NLEG14					
NLEG15					
NLEG19					
P6					
NLEG23					
NLEG24					
P7					***failed picking (too few specimens)**
SICE4					

T2-1.2. Ocean acidification effects on the mobility of particulate and dissolved organic carbon (POC, DOC), essential trace elements (micro nutrients) and heavy metals

Stephen Kohler and Nicolas Sanchez (NTNU), PI: Murat V. Ardelan (NTNU)

Objective: The purpose of this task is to understand the impact of ocean acidification on the biogeochemistry (cycling and mobility) of dissolved organic carbon (DOC) and trace elements in the water column of the Northern Barents Sea. To best explore this topic, a complete survey of trace elements and heavy metals needs to be sampled along the entire transect and at various depths under clean sampling and handling conditions. In addition, the characterization of dissolved organic matter (DOM, DOC), at each station at select depths will aid in understanding the different forms and distributions of DOM and how they may interact with trace elements. As the solubility of trace metals, both essential and toxic, are dependent on its interaction with DOM, the distribution and type of both trace metals and DOM was surveyed.

Trace elements (micronutrients): Both total (n= 56) and dissolved (n= 56) trace elements, were successfully sampled at all process stations (P1-P7) at eight depths up to 15 m above the seabed or up to 500m with GO FLO bottles with clean sampling and handling techniques. Replicate samples were collected at certain stations

Heavy metals (Hg): Separately, samples for both total mercury (n=56) and methylmercury (n=56) were also collected at all process stations (P1-P7) at eight sampling depths up to 500m with GO FLO bottles using clean sampling and handling techniques. At stations P6 and P7, samples for total mercury and methylmercury were also collected from the deeper depths (>500m) from the CTD rosette with bottles to complete the profile. Replicate samples were collected at P1, P4, and P7. To compare the clean sampling technique to the CTD, samples were collected from the CTD at P7 at the same depth as one of the GO FLO depths. We hope to share mercury data with RF2, T2-2, and RF3, T3-4.1.

Dissolved organic matter (DOM) characterization: Samples were collected for depths labeled *surface (10 m), middle,* and *deep,* dependent on local station bottom depth. All process stations (P1-P7) were sampled and collected from GO FLO bottles, with the exception of P6 and P7 deep samples collected from the CTD rosette. TOC, and ancillary POC measurements were collected from all samples, and DOC quantitation samples were taken at P1, P4, and P7. Two additional casts were made at P1 and P4 to serve as replicates for surface and deep

samples. P7 replicates were sampled simultaneously for surface (two GO FLOs attached together) and deep (two CTD bottles). All samples were subsequently collected, filtered, and extracted for DOM.
Ice work: Two ice cores were collected for trace elements at P6 ICE and P7 ICE. Cores were collected whole, and then cut and processed onboard according to AeN protocol.
Two ice cores were collected for Hg at P6 ICE and P7 ICE. Cores were collected whole, and then cut and processed onboard. At P6 ICE, 1 meltpond was sampled for total mercury, and at P7 ICE, 3 meltponds were sampled for total mercury.
1 ice core was collected for DOM at P6 ICE and kept frozen onboard. The core will be transported frozen back to NTNU for processing. At P6 ICE, 1 meltpond was sampled for DOM, filtered, and extracted.
Sediment sampling: At all process stations (P1-P7), with the exception of P3, samples of surface sediments were collected by the benthos group (UiT – Nord) for trace element analysis by sequential sediment extraction.

T2-2.1. Effects of changes in species composition and distribution on contaminant in food web accumulation

Julia Giebichenstein (UiO), Rita Amundsen (UiO), Ane Haarr (UiO), Håvard Nilsen Liholt (UiO), Robynne Nowicki (UNIS), PI: Katrine Borgå (UiO)

Purpose: As changes in temperature and sea ice distribution and thickness are expected in the Barents Sea, the energy transfer processes in the food web are expected to change. The present study aims at identifying and comparing bioaccumulation and biomagnification processes of legacy and emerging contaminants (e.g. persistent organic pollutants and mercury) related to energy use and availability between an Atlantic-influenced and an Arctic marine pelagic food web in the Barents Sea throughout the year. Zooplankton and fish samples will be collected during the process study cruises. From these, chemicals representing lipid soluble and protein associated contaminants will be analyzed, in addition to dietary descriptors to trace energy source (stable isotopes and lipid analyses). Model predictions of climate change effect on food web accumulation of contaminants include reduced accumulation due to predicted reduction in lipid storage. Bioaccumulation changes due to altered dietary composition is predicted to have less influence than the predicted lower lipid content. These predictions will be tested in the present task.
Approach: During this cruise we have collected water, zooplankton and fish samples for legacy and emerging contaminants, mercury, stable isotope and fatty acid analyses. Doreen Kohlbach (NPI) will analyze the fatty acid samples and the stable isotope samples will be analyzed at UiO. We hope to share mercury data with T2-1.2 and PFAS data with Jack Garnett from Lancaster University.
Water samples for legacy persistent organic pollutant (POP) analyses were collected with an in-situ filtration pump (see Figure 6) at the process stations P2, P4, P6 and P7. To compare the

influence of warmer, more saline Atlantic water on contaminant levels with the cold, fresher Arctic water we tried to target both water masses, if applicable. In addition, we took water samples from the CTD rosette in triplicates for PFAS analyses at P1-2, 5-7.

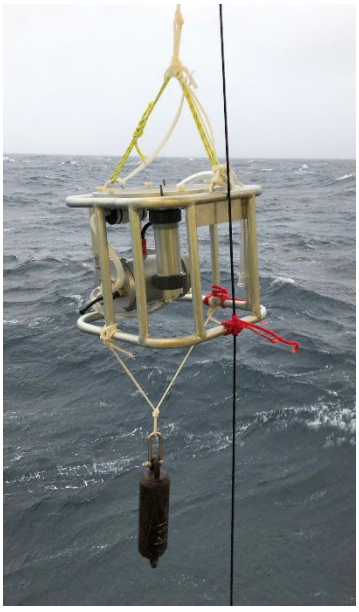


Figure 6. In-situ filtration pump

Meso- and macrozooplankton samples of key food web species were collected at each process station, except P3. Mesozooplankton (primarily Copepod stages CIV and CV) were sampled with either WP3 or Bongo Nets. Macrozooplankton (mainly euphasiids, amphipods and chaetognaths) samples were collected from the MIK net or from the macrozooplankton trawl (see Figure 7 for an example from the MIK net). Deep and shallow nets were taken at P6 and P7 to target species from both water masses (see Macrozooplankton part – RF3 in this report for further information on species composition at the different process stations). All zooplankton samples were sorted and grouped by family and by species if possible. Samples for contaminants were handled as little as possible to avoid cross-contamination. We sampled for POPs, mercury, stable isotope and fatty acid analyses.

Figure 7. Zooplankton sample from P7 (left), and Polar cod (Boroegadus saida) caught at P4 (right).

Fish tissue and whole fish were sampled for POPs, mercury, stable isotope and fatty acid analyses at P1-P4. The stomach was frozen for microplastic analyses and otoliths for age determination were dissected. The target species relevant to the pelagic Barents Sea food web included Polar cod (*Boreogadus saida*), Atlantic cod (*Gadus morhua*) and Capelin (*Mallotus villosus*) and were below 25 cm in total length (see Table 3). Other dominant fish species (like *Sebastes spp*. at P1) were sampled opportunistically and frozen whole. (see part T2-3-1 in this report for detailed information on the trawls).

Table 3. Overview of the number of sampled fishes at the process stations.

Process station	P1	P1 vicinity	P2	P3	P4	Total
Atlantic cod (*Gadus morhua*)	9	-	-	-	-	9
Polar cod (*Boreogadus saida*)	11	-	15	10	17	5
Capelin (*Mallotus villosus*)	10	55	-	-	-	65

Part of the sampled fishes were shared with subtasks 2-3.1, 2-2.3, 2-2.4 and 2-2.5 for genomic and further ecotoxicological analyses.

T2-2.3. Effects of oil and contaminants on northern Barents Sea ecosystem health.
Ane Haarr and Håvard Liland (UiO), PI: Ketil Hylland (UiO)

The purpose of this work is to quantify levels of DNA damage (measured in fresh blood) and concentration of PAH metabolites (measured in bile) in individual fish from different species residing in the northern Barents Sea. The Atlantic cod *Gadus morhua*, atlantic capelin *Mallotus villosus*, polar cod *Boreogadus saida*, and American plaice *Hippoglossoides platessoides,* are abundant fish species in the northern Barents Sea, representing different ecological niches and trophic levels and are important both ecologically and commercially.

Polyaromatic hydrocarbons (PAHs) are organic contaminants of petrogenic or pyrogenic origin, meaning that they are associated with petroleum products or formed by incomplete combustion of organic material. Some PAHs are well known carcinogens, such as benzo(a)pyrene, while some are less well known. Most vertebrates are quite efficient in metabolizing and detoxifying PAHs, so its metabolites are therefore often measured in the bile and used as an indicator of PAH exposure. Laboratory experiments have shown the association between PAH exposure and DNA damage, and various methods can be used to quantify damage to the genome. The Comet assay is a relatively quick, easy and inexpensive method to assess single or double stranded breaks in the DNA, which can result from exposure to contaminants and other types of stressors. Even though causal relationships are difficult to assess from field studies, it is still important to monitor contaminant concentrations and levels of DNA damage to assess species-specific differences in exposure, baseline activity and sensitivity, especially in a rapidly changing Arctic environment.

During this cruise, 30 individuals of each fish species were collected across stations P1-P4 using pelagic and benthic (with and without fish lift) trawls. No trawls were conducted north of P4 due to the ice conditions. Opportunistic sampling of the Arctic amphipod *Themisto* sp. for quantification of DNA strand breaks was also a part of the initial plan, but this species was only caught in abundance at P2, and was not available for this purpose. For all sampled fish, biometric data were recorded, and some individuals were shared between the other groups. For shared fish, different types of tissues were taken for various purposes: stomach for the analysis of microplastics, muscle samples for POPs, mercury, fatty acids, and stable isotopes (Julia Giebichenstein, T2-2.1); spleen and fin clip for genomic analysis as well as assessments of age and maturation stage (Siv Hoff and Leif Christian Stige, T2-3.1); and liver slices for experimental exposure studies (Nadja Brun and Fecadu Yadtetie, T2-2.4). At P1, Atlantic cod were abundant in the first benthic trawl. 29 individuals of various size classes (approximately one third small, medium, and large individuals) were sampled. Eight individuals of polar cod were sampled, but the fish were in bad condition after the trawling (without fish lift), and blood samples may be affected by this. As there was an echosignal between P1 and P2, a pelagic trawl was conducted, and 30 individuals of capelin were sampled for blood and bile. Bile samples are not complete for all individuals, as the gall bladder sometimes was empty or difficult to locate in the small capelin. Additional polar cod were caught with benthic trawls (with fish lift) at the rest of the stations (up to station P4) and the fish could be kept alive in the fish tanks prior to sampling. After the sample size was complete (30 individuals), an additional 20

individuals were sampled to assess different methods for preservation of blood. The cryopreservation method in the protocol include gradual freezing of blood samples mixed with a cryosolution, and thus, 10 blood samples were frozen directly at -80°C without cryosolution, and 10 blood samples were snap frozen in liquid nitrogen and stored at -80°C.

T2-2.4. Using genomic and proteomic tools to identify responses to effects of pollutants on zooplankton and fish.
Fekadu Yadetie (UiB) and Nadja Brun (Woods Hole Oceanographic Institution, USA), PI: Anders Goksøyr (UiB).

The Arctic region is susceptible to pollution from expanding petroleum related activities as well as from long range transport of pollutants deposited in the polar region. Seasonal and climate changes may dictate high lipid content and its mobilization which can influence pollutant bioaccumulation, bioavailability, and effects in Arctic organisms. Despite the unique energy and pollutant dynamics, toxicological data on the arctic species is sparse. The aim of this sub-task is to map toxicogenomic responses in arctic fish and zooplankton (*Calanus*).

Fish: The focus on this cruise was to sample key Arctic fish species, and culture liver slices to perform exposure studies to the oil related PAH compound benzo[a]pyrene (BaP). Four species, Atlantic cod (*Gadus morhua*), capelin (*Mallotus villosus*), Polar cod (*Boreogadus saida*) and American plaice (*Hippoglossoides platessoides*) were sampled from the process stations P1, P2 and P3 and seven exposure experiments (each with 6 replicates per group, with 4 exposure groups) were performed. Samples collected and frozen were: liver or whole fish for possible chemical analysis (Table 4), liver slices for RNA (transcriptomics) and proteomics and/or enzyme assay (e.g. EROD) (Table 5). Slices were also collected for viability and possible vitellogenin assays for each species. Media samples from each liver slice experiments were collected for viability assay and frozen. All tissue samples were snap-frozen in liquid N2 and stored at –80 °C. Although further chemical exposure experiments were planned after station P4 with polar cod kept alive in fish tanker, this could not be performed because the fish were accidentally exposed warmer water in the tanker and died. Biometric data (total length, fish weight, liver weight, sex) on most of the fish we sampled were shared with other sub-tasks in RF2: T2-2.1, T2-2.2, and T2-2.3.

Calanus: In process stations P6 and P7, key copepod species *Calanus finnmarchicus*, *C. hyperboreus* and *C. glacialis* were sampled and exposed to the PAH compounds Phenanthrene (Phe) and BaP. These experiments were planned and performed in collaboration with the Ecotox groups (sub-tasks T2-2.2 and 2-2.3) at UiO (Julia Giebichenstein) and Kasia Dmoch. After a range finding experiment with increasing doses of Phe and BaP (using *Calanus finnmarchicus*), a single dose was selected, and exposure experiments were performed for each of the three *Calanus* species (Table 6). The animals were collected and snap-frozen in liquid N2 and stored at –80 °C. RNA will be extracted and extracted and toxicogenomic responses will be studied and compared using RNA-seq at UiB.

In both fish and *Calanus* experiments, we expect to characterize global gene expression fingerprints in response to the PAHs in these species which may give us information on mechanisms, comparative susceptibilities, and possible future expression biomarkers.

Table 4. Fish tissue sampled at different stations.

Process station	Trawl type	Species sampled	Number of fish	Sex	Processing	Samples collected	Comments
P1	Bottom	Atlantic cod	6	Male	PCLS culture and BaP exposure	Slices for RNA and protein extraction	4 concentration groups (6 fish replicates (paired design).

							72h exposure, 10 °C.
P1 vicinity	Pelagic	Capelin	24	Male and female	Manual slicing and culture, 1 liver/well. BaP exposure	Slices for RNA, protein extraction and viability (ATP) assay.	Manually sliced, 6 replicates/per group, 1 fish liver per well. 72 h exposure at 10 °C.
P2	Bottom	American plaice	6	Female	PCLS culture and BaP exposure	Slices for RNA, protein extraction and viability (ATP) assay.	72 h exposure at 10 °C.
P2	Pelagic	Capelin	25	Male and female	Manual slicing of pooled livers, BaP exposure	Slices for RNA, protein extraction	Manually sliced, 6 replicates wells per group. 48h exposure at 6 °C.
P3	Bottom	Polar cod	6	Male	PCLS culture and BaP exposure	Slices for RNA, protein extraction and viability (ATP) assay	72 h exposure at 6 °C.
P3 (from tank)	Bottom	Polar cod	6	Female	PCLS culture and BaP exposure	Slices for RNA, protein extraction	72 h exposure at 6 °C.
P3 (from tank)	Bottom	Polar cod	6	Female	PCLS culture and BaP+ EE2 exposure	Slices for RNA or protein extraction and viability (ATP) assay	To test mixture (BaP and EE2). Test for anti-estrogenic effects of BaP. 72 h exposure at 6 °C.

Table 5. Summary of liver slice exposure experiments

Process station	Trawl type	Species sampled	Number of fish	Sex	Samples collected	Comments
P1	Bottom	Atlantic cod	7	Male and female	Piece of liver (ca. 1g and 5g) frozen	All cod have intestinal parasites
P1	Bottom	American plaice (AP)	4	Female	Piece of liver (ca. 5g) frozen	All AP have intestinal parasites, and all appear females. Most have discolored, neoplastic like liver
P1 vicinity	Pelagic	capelin	10	Male and female	10 whole capelin frozen	For possible chemical analysis
P2	Bottom	American plaice	13	Female	Piece of liver (ca. 5g) frozen	Most of the AP livers have discoloration (at least partly) and many seem to have neoplasms/cancer (pictures taken). All AP have intestinal parasites. AP seem all female
P3	Bottom	Polar cod	20	Male and female	Whole livers frozen	For possible chemical analysis

Table 6. Calanus samples and PAH exposure experiments.

Station	Gear type	Species sampled	Number of animals	Stage	Processing	Samples collected	Comments
P6	MIK	*C. finmarchicus*	300-350	CV	Exposure DMSO control, 0.1uM Phe, 0.1uM BaP 5 replicates of 0.5L (20 animals/bottle) Extra bottles for seawater only control.	Live animals collected and frozen for RNA extraction.	72h exposure at 3.5 °C.
P6	Bongo net 180 um	*C. glacialis*	120-150	CV	Exposure DMSO control, 0.1uM Phe, 0.1uM BaP 4 replicates of 0.5L (10 animals/bottle). Extra bottles for seawater only control.	Live animals collected and frozen for RNA extraction.	72h exposure at 0.5 °C.
P7	MIK	*C. hyperboreus*	200-250	CV	Exposure DMSO control, 0.1uM Phe, 0.1uM BaP 5 replicates of 0.5L (10 animals/bottle). Extra bottles for seawater only control.	Live animals collected and frozen for RNA extraction.	72h exposure at 3.5 °C.

T2-2.5. Critical seasonal windows of responses to multiple stressors on key organisms in a pelagic food chain
Robynne Nowicki, PhD student (UNIS/UiO), PI: Geir Wing Gabrielsen (NPI)

Purpose
The samples taken on this cruise will be used in T2-2.5. This cruise is the first of 4 seasonal cruises in which macrozooplankton and fish samples will be taken for bioenergetics, protein, lipid and pollutant remobilization analysis. The samples taken will be used to assess seasonal fluctuations in energy content of key organisms in the pelagic food web of the Barents Sea. This data will be used to expose the annual critical windows in which organisms may be of weakened body condition and predators may have a low-quality food supply. Thus these organisms may be more susceptible to stressors such as persistent organic pollutants and climate change parameters, during this critical period. I also took samples of macrozooplankton to assess sexual maturity and life history stages, in order to allow for a more trait-based approach to seasonal energy variation. As well as this, polar cod brains were collected (to be used in conjunction with brains collected from Brunnich guillemots and kittiwakes from Svalbard in future) for organ specific analysis of seasonal pollutant remobilization. Samples were taken at each process station (excluding P3), allowing for additional comparison of southern (Atlantic) and northern (Arctic) species, as well as regional differences in individuals of the same species.

Sampling approach
Macrozooplankton: Macrozooplankton were sampled using MIK-net 1500um V-hauls, and macrozooplankton trawls, at stations P1-5, with P6 and P7 only having MIK-net 1500um vertical hauls due to ice conditions. The bulk samples were sorted into major zooplankton groups, with this work focusing on krill, amphipods and pteropods, with 2-3 species selected for each. Individuals were selected and measured, with an aim to collect a range of size classes, in order to assess the relationship between body size and energy content. For each sample, organisms were wrapped in aluminium foil, placed in a labelled Ziploc bag and frozen at -20°C. Large organisms were stored individually, whilst smaller organisms were pooled per sample, with the aim of each sample weighing between 0.5-1g. Samples were taken opportunistically, with not all species being collected from each station. Where abundance allowed, I also took samples to be later assessed for sexual maturity and life history stage. I stored these individuals in 5% formalin seawater solution. *Themisto libellula* was the most consistent species, being collected from every process station.

Fish: Fish were collected using campelen and Harstad fish trawls at station P1, P2 and P4. Atlantic cod (*Gadus morhua)*, capelin (*Mallotus villosus)* and polar cod (*Boreogadus saida)* were the target species collected. However Atlantic cod were only available from P1 and capelin from P1 and P2, whilst polar cod were taken from all sampled stations. The fish were taken whole from the trawl (roughly 10-25 individuals per species per station where abundance allowed), weighed and measured for total length. Individuals were then wrapped in aluminium foil and frozen at -20°C. Polar cod were present at every process station. Polar cod that were dissected for other simultaneous sampling onboard had their brains removed for remobilization studies, with weight and total length of the sample fish being noted.

T2-3.1. Climate change and fisheries: Spatial environmental variables and genomics
Siv Hoff and Leif Christian Stige (UiO), PI: Sissel Jentoft (UiO)

The aim of this task is to investigate the roles of spatiotemporal population structure and possible local adaptations in three key fish species in the northern Barents Sea ecosystem: The Northeast Arctic population of the Atlantic cod (*Gadus morhua*), capelin (*Mallotus villosus*) and polar cod (*Boreogadus saida*). If local adaptations are important for population dynamics and responses to climate change, it may be necessary to revisit the management of fisheries in order to maintain intact spatial and genetic structure. For this purpose, individual samples

of these species will be collected at transect cruises in summer (2 years) and winter (1 year) for whole-genome sequencing. We will also include samples of the same species collected in associated projects at other locations, such as at their spawning grounds. From these data we aim to characterize the population sub-structure(s) for each of the species, as well as identify signatures of directional selection, for instance as a result of temperature adaptations. In addition to spatial structure, we will assess possible temporal structure, linked to seasonal partitioning of habitat use.
During this cruise we have been collecting tissue samples of the Northeast Arctic cod, polar cod and capelin from the different process stations: P1, P2, P3, and P4 vicinity (Table 7). At all stations, one demersal (Campelen) fish trawl was taken. Pelagic trawling was planned to be done "opportunistically" if signal on the echo sounder indicated presence of fish schools, resulting in one pelagic (Harstad) trawl that was taken between P1 and P2 (P1 vicinity). At station P3 and P4 a fishlift was attached to the trawl, and fish from these catches were kept alive in fishtanks.

Table 7. Number of fish sampled at each of the stations during SSQ3. All trawls taken was demersal except P1 vicinity, which was a pelagic trawl.

Station/ Species	P1	P1 (vicinity)	P2	P3	P4 (vicinity)	P5
Northeast Arctic cod	32	-	5	-	-	-
Capelin	24	36	26	6	-	-
Polar cod	17	-	40	40	43	-

In concordance to last year sampling (JC1/2: 6-23 Aug. 2018), the Northeast Arctic cod was observed at the first two stations P1 and P2, where P1 trawl catch contained a mix of smaller individuals and larger individuals and P2 station contained a few smaller individuals (<20 cm). Capelin was caught both in pelagic and bottom trawls. Interestingly, in comparison to last year's sampling, adult polar cod was this year caught in all demersal trawls taken, from P1 through P4, whereas they were first time observed at P3 last year. P5 was not trawled this year due to ice.

For all sampled fish, a total of three tissue samples were taken, two for whole-genome DNA sequencing (approx. 20x coverage), and one for RNA sequencing. Additionally, otoliths were collected for all fish sampled, in order to determine age.

Metadata was recorded for all fishes sampled, and includes the following parameters: fork length, total length, total weight, sex, maturation stage and presence of ecto/endoparasites. In addition, for the Northeast Arctic cod and a subset of the sampled polar cod at each station liver, gonad and somatic weight was also recorded. A subset of the sampled fish was shared with subtasks 2-2.1, 2-2.3, 2-2.4 and 2-2.5 for ecotoxicological analysis.

Research Foci 3 – The living Barents Sea

T3.1 and T3.4 Microbes: biodiversity, abundance, biomass, distribution and activity.
Oliver Müller (UiB), Lasse Olsen (UiB), Miriam Marquardt (UiT), Martí Amargant (UiT), Bente Edvardsen (UiO), Karoline Saubrekka (UiO), Anna Vader (UNIS), PIs: Bente Edvardsen (UiO), Gunnar Bratbak (UiB)

The activity contributes to tasks T3-1 and T3-2 and links to T3-3 and T3-4. Samples for microbial (viruses, prokaryotes and protists) community composition, abundance and activity were collected from two open water stations (P1 and P2) and four ice covered stations (P4, P5, P6 and P7). A reduced sampling effort was conducted at the open water station P3 and ice covered station SICE4. Pelagic samples were collected at all stations, while stations P6, P7 and SICE4 also included ice samples (ice-cores, under ice water and melt ponds, see more detailed description of sea ice work below). In addition, Flow Cytometry samples were taken for the standard depths at several NLEG stations (NLEG5, NLEG6, NLEG8, NLEG9, NLEG10, NLEG12, NLEG14, NLEG15, NLEG19, NLEG23, NLEG24). Sampling also included phytoplankton nets. Chl *a* and live protist samples were analysed on board, while all other samples were preserved or frozen for later analyses. An overview of parameters and samples (also including samples from sea ice cores, is given in Table 8.

List of parameters sampled:
Biodiversity

- Genetic identification of community composition of protists and prokaryotes (Metabarcoding)
- Genetic identification of (free) virus diversity (Virus diversity)
- Qualitative analyses of protists >10 µm from net hauls (Net)
- Qualitative analyses of small protists for cultures and electron microscopy from water (Vivaflow)
- Qualitative and quantitative analysis of plankton including coccolithophores by scanning electron microscopy (SEM)
- Algal diversity by culturing (Cultures)

Abundance and biomass

- Algal biomass (total and >10 µm chlorophyll a concentration Chl *a*)
- Abundance of bacteria, virus, pico and nano-plankton by flow cytometry (FCM)
- Quantitative analyses of protists from water samples by light microscopy (Microscopy)
- Particulate organic carbon and nitrogen (POC/PON)
- Elemental composition of seston (XRF, particulate C:N:Si:Ca:P:Mg:S:K:Fe)(XRF)

Activity

- Genetic identification of protist activities (Metatranscriptome)
- Bacterial production
- Primary production
- Nitrogen uptake by primary producers
- Primary producer's response to light intensity

Table 8. water column and ice sampling for microbes (see text above for abbreviations). For nutrients, see also overview in Table 2.

Stn	Depth (m)	Metabarcoding	Virus diversity	Phytoplankton pot.	Vivaflow	SEM	Cultures	Chl. *a*	FCM	Microscopy	POC/PON	XRF	Metatranscriptom	Bacterial	Primary	Nitrogen uptake	P vs. I curves	Nutrients
P1																		
	5	x				x/		x	x	x	x		x	x	x	x		x
	10							x	x	x	x	x		x				x
	20							x	x		x	x		x	x			x
	30							x	x	x	x			x				x
	40							x	x		x			x	x			x
	50							x	x		x	x		x				x
	60							x	x	x	x	x		x	x			x
	90							x	x	x	x	x		x	x			x
	120					/X		x	x		x			x				x
	200	x				x/		x	x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	Chl a=45	x	x		x	x/X	x	x	x	x	x	x		x	x	x	x	x
	0-50			x			x											
P2																		
	10	x				x/	x	x	x	x	x	x	x	x	x	x		x
	20							x	x		x	x		x				x
	30							x	x	x	x	x		x				x
	40							x	x		x			x				x
	50=Chl a	x	x		x	x/X	x	x	x	x	x	x		x	x	x		x
	60							x	x	x	x	x		x				x
	90							x	x	x	x	x		x				x
	120							x	x		x			x				x
	150	x				x/X		x	x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	0-100			x			x											
P3																		
	10	x				x/	x	x	x	x	x	x		x				x
	20							x	x		x	x		x				x
	30							x	x	x	x			x				x
	40							x	x		x			x				x
	50							x	x		x	x		x				x
	60							x	x	x	x	x		x				x
	90							x	x	x	x	x		x				x
	120							x	x		x			x				x
	200	x				x/X		x	x		x	x		x				x
	bottom	x				x/X		x	x		x	x		x				x
	Chl a=75	x			x	x/X	x	x	x	x	x	x		x				x
	0-100			x			x											
P4																		
	10	x				x/	x	x	x	x	x	x	x	x	x	x		x
	20							x	x		x	x		x	x			x
	30=Chl a	x	x		x	x/X	x	x	x	x	x	x		x	x	x	x	x
	40							x	x		x			x	x			x

	50							x	x		x	x		x				x
	60							x	x	x	x	x		x	x			x
	90							x	x	x	x	x		x	x			x
	120							x	x		x			x				x
	150					X			x		x			x				x
	200	x				x/		x	x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	0-100			x			x											
P5																		
	10	x				x/	x	x	x	x	x	x	x	x	x	x		x
	20=Chl a	x	x		x	x/X	x	x	x	x	x	x		x	x	x	x	x
	30							x	x	x	x	x		x				x
	40							x	x		x			x	x			x
	50							x	x		x	x		x				x
	60							x	x	x	x	x		x	x			x
	90					X		x	x	x	x	x		x	x			x
	120							x	x		x			x				x
	150	x				x/		x	x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	0-100			x			x											
P6																		
	10	x				x/		x	x	x	x	x	x	x	x	x		x
	20							x	x		x			x				x
	30							x	x	x	x			x	x			x
	40							x	x		x	x		x	x			x
	50							x	x		x			x				x
	60							x	x	x	x			x	x			x
	90							x	x	x	x	x		x	x			x
	120							x	x		x			x				x
	200	x				x/X		x	x		x	x		x				x
	500								x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	Chl a=15	x	x		x	x/X	x	x	x	x	x	x		x	x	x	x	x
	0-100			x			x											
P7																		
	10	x				x/		x	x	x	x		x	x	x	x		x
	20							x			x							x
	30							x	x	x	x			x				x
	40							x			x	x			x			x
	50							x			x							x
	60							x	x	x	x	x		x	x			x
	90							x	x	x	x			x	x			x
	120							x	x		x			x				x
	200	x				x/		x	x		x	x		x				x
	500								x		x	x		x				x
	1000					x/		x	x		x	x		x				x
	1500								x		x	x		x				x
	2000								x		x	x		x				x
	2500								x		x	x		x				x
	bottom	x	x			x/X		x	x		x	x		x				x
	Chl a=15	x	x		x	x/X	x	x	x	x		x		x	x	x	x	x
	0-100			x			x											
P6ice																		
	0-3	x					x	x	x	x	x			x	x	x	x	x

	3-10	x					x	x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x							x
	130-top	x						x	x	x				x				x
	0-10		x			x/X						x						
	UIW 0.5	x		x	x	x/X	x	x	x	x	x	x		x				x
	MP1	x			x	x/X	x	x	x	x	x	x		x				x
	MP2	x				x		x	x	x	x	x		x				x
	MP3	x				x		x	x	x	x	x		x				x
	MPM							x							x	x		x
P7ice																		
	0-3	x					x	x	x	x	x			x	x	x	x	x
	3-10	x					x	x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x			x				x
	0-10		x			x/X			x			x		x				
	UIW 0.5	x		x	x	x/X		x	x	x	x	x		x				x
	MP1	x		x	x	x/X	x	x	x	x	x	x		x				x
	MP2	x		x		x		x	x	x	x	x		x				x
	MP3	x		x		x		x	x	x	x	x		x				x
	MPM														x	x		
SICE 4																		
	0-3	x						x	x	x	x			x				x
	3-10	x						x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x							x
	130-150	x						x	x	x	x							x
	150-top	x						x	x	x	x			x				x
	0-10		x			x/X						x						
	UIW 0.5	x		x		x/X		x	x	x	x			x				x
SICE 4																		
	10					x		x	x	x	x	x	x	x	x	x		x
	20=Chl a	x	x		x	x/X	x	x	x	x	x	x		x	x	x	x	x
	30							x	x	x	x			x				x
	40							x	x		x	x		x	x			x
	50							x	x		x							x
	60							x	x	x	x	x		x	x			x
	90							x	x	x	x			x	x			x
	120					X		x	x		x	x		x				x

	150								x		x						x
	200	x				x		x	x		x	x		x			x
	500								x		x	x		x			x
	1000							x	x		x	x		x			x
	1500								x		x	x					x
	2000								x		x	x		x			x
	bottom	x	x			x/X		x	x		x	x		x			x
	0-100			x			x										

On board experiments:
On board experiments included a grazer exclusion experiment, which was done at stations P1, P4 and P6, prepared by gentle reverse filtration of surface water from the Chl a max to retain organisms of different size fractions (<0.8µm; <3µm; <90µm) and were incubated each for six days at close to *in situ* light and temperature. Subsamples for abundance, activity and diversity analysis were taken at different frequencies throughout the incubation period.

Several functional aspects of pelagic and sympagic primary producers were studied during the Nansen Legacy Q3 cruise. In open water stations (P1, P4, P5), water was sampled from the standard depths 10, 20, 40, 60, 90 and Chl a max. Water from these depths was spiked with radioactively labelled carbon in order to determine the Carbon fixation rate (i.e. the Primary Production rate) of phototrophic organisms throughout the water column and latitudinal gradient. Additionally, water from 10m and Chl a max was spiked with stable isotopes of Carbon (13C) and Nitrogen (15N) to estimate the F-ratio (which fraction of the primary production is new production). One incubation bottle was also treated to assess the nitrification activity of microbes. These incubations were deployed attached to the sediment trap moorings and exposed to in situ light and temperature conditions for 24 hours. In parallel, water from the Chl a max was used to study the photosynthetic response of the community to light intensity (P vs I curves). At the ice-covered stations (P6 and P7), the aforementioned water sampling and experimental work was carried out as described, and additionally the bottom 3cm of 4 ice cores were sampled and pooled for similar in situ incubations: Under-ice Primary production, Nitrogen uptake and P vs I curve. Water from a melt pond was sampled, spiked and incubated in situ for Primary Production and Nitrogen uptake. A reciprocal transplant experiment was conducted with surface water from stations P1 and P6 and will be analyzed for abundance and community shifts due to changes in environmental factors.

T3-1.1. Characterize biological phytoplankton/ protist communities and seasonality in terms of biodiversity, abundance, biomass and distribution patterns
Karoline Saubrekka and Bente Edvardsen (University of Oslo/ IBV), Anna Vader (UNIS), PI: Bente Edvardsen (UiO)

The main aim of our sampling during the cruise was to collect material which will be used to study diversity, distribution and ecology of microalgae and other protists along the Barents Sea to Arctic Ocean transect. Our sampling also focused on Sea ice communities, and we collected material from melt ponds, ice cores and under-ice.

For the **molecular analysis** of diversity (metabarcoding) and function (metatranscriptomics) of phytoplankton and protist communities along the transect. We took part in collection and filtration of the molecular samples as well as sampling and processing of ice-cores and sea water on ice. A complete list of which microbial parameters were collected at which depth and stations is presented elsewhere in the report.

For the **analysis of phytoplankton** abundance, we collected samples from CTD Niskin bottles at all planned depths at station P1. At station P2-P7 and SICE4 sample depth 5m was changed to 10m, due to sampling through the moonpool. Samples where fixed in formalin and Lugol´s

solution for further light microscopy analysis in the lab. They will provide quantitative and qualitative information about phytoplankton abundance and diversity along the transect.

Morphological analysis of phytoplankton diversity and isolation of cultures of Arctic microalgae. We also collected samples for the scanning electron microscopy (SEM) analysis of small phytoplankton and groups which are not well preserved in quantitative samples fixed in Lugol's solution. This includes primarily calcifying microalgae (coccolithophores) which are an important part of the Barents Sea phytoplankton. The samples for quantitative and qualitative SEM analysis were taken at each station at four depths which corresponded to depths sampled for molecular metabarcoding and metatranscriptomics.

A plankton net (mesh size 10µm) was deployed at each station to obtain a concentrated phytoplankton vertical sample. The collected material was divided in five parts. One part was fixed in 2% formalin and one in 1% Lugol's for light microscopy to be used together with the quantitative samples above. Another part was fixed in 1% Lugol's and one in 1% glutaraldehyde and these will be used for studying diversity of protists using scanning and transmission electron microscopy at UiO. One part was kept alive in a cool room with light. This material was analysed onboard by microscopy, preliminary species lists were made and micrographs taken. It was also used to establish mono-algal cultures by dilutions on board. Finally, the last part of the net sample was mixed with algal growth medium (IMR1/2) and kept alive in the cool room with light ("raw cultures"). These dilutions and raw cultures will be taken to UiO where more cultures will be isolated.

At the process stations and all ice stations, we used **Vivaflow filtration system** to concentrate cells that are so small that they are not collected with the plankton net. This was always done from the Niskin bottles from depths with chlorophyll maximum. On ice stations, Vivaflow filtration was also done using Melt pond water samples and under-ice samples. After isolation, the same procedure was applied as with net samples. First part was fixed, second part was kept alive third part was enriched with growth medium and kept alive. To establish cultures of small microalgae, we made dilution cultures at each station using the Viva flow concentrated samples. These dilution cultures as well as raw cultures from Vivaflow material will be taken to UiO for further analysis.

At sea ice stations, we sampled water from melt ponds, 0.5m below ice and 5m below ice and concentrated it using both 10µm bottle-net and viva flow system. Part of material was fixed for SEM, TEM and LM and another part kept as raw cultures for later analysis. Also, the bottom 10cm from ice-cores was sampled, part fixed for microscopy and the rest taken to UiO as a raw culture.

The protocol has been revised from the Nansen Legacy Protocol Version 4, and a complete list of samples is given in Table 8, above.

T3-1.1; 2.1. Mesozooplankton taxonomy, abundance, biomass and genomics
Anette Wold (NPI), Kasia Dmoch (IOPAS) and Konrad Karlsson (UNIS), PI: Tove M. Gabrielsen (UNIS/ UiA)

Purpose
The main objective was to describe the mesozooplankton taxonomic composition, abundance and biomass along the transect going from open Atlantic water (P1) to ice covered Arctic water (P7). We expect to see a gradient in the presence of Atlantic and Arctic species. The transect also represent a gradient from a late summer condition at the southernmost stations to a spring situation in the northernmost ice-covered stations, allowing for a space for time approach along the transect.
The data obtained during this cruise are part of the seasonal investigations of zooplankton communities and will be continued on AeN seasonal cruises in Nov/Dec 2019 & spring 2020.

Description of work

We have sampled with Multinets and Bongonets of both 180 µm and 64 µm in order to cover all size groups and we refer to the samples from the two mesh sizes as “mesozooplankton” and “small mesozooplankton” respectively (Table 9). Samples for taxonomy and abundance was sampled using the Multinet at 5 standard depths (Table 10). The standard sampling depths were from the bottom-200, 200-100, 100-50, 50-20 and 20-0 m. At the deep stations, the sampling depths were from 1000-600, 600-200, 200-50, 50-20 and 20-0 m. All samples were preserved in 4 % formaldehyde free from acid. (final concentration) free from acid.

Samples for total biomass as dry weight and metabarcoding was sampled using Bongonets from the bottom-surface and from 1000 m to surface at the deep stations. The biomass samples were dried and measured onboard. Genetic samples for metabarcoding was preserved in ice cold 96 % ethanol.

Gelatinous zooplankton were picked out from MIK net & Bongonet samples at station P2, P4, P5 & P7. Pictures were taken of all individuals of each taxa. And individuals in good conditions were stored individually with ice cold 96 % ethanol. It would improve the sampling of gelatinous zooplankton to use a light-board and have a dedicated camera and a better system for naming and storing pictures immediately after sampling. Due to time constraint, pictures were not taken of the taxa from the Bongonets only from the MIK nets. We should improve the effort to also pick out smaller individuals of gelatinous zooplankton in the future.

Table 9. Overview of mesozooplankton sampling

Purpose	Gear	Station	N samples	Task
Mesozooplankton taxonomy	Multinet 180 µm	P1, P2, P3, P4, P5, P6, P7	35	T3-1.1 & 1.2 T3-2.1 & 2.2
Small mesozooplankton taxonomy	Multinet 64 µm	P1, P2, P3, P4, P5, P6, P7	35	T3-1.1 & 1.2 T3-2.1 & 2.2
Mesozooplankton biomass	Bongonet 180 µm	P1, P2, P4, P5, P6, P7	6	T3-1.1 & 1.2 T3-2.1 & 2.2
Small mesozooplankton biomass	Bongonet 64 µm	P1, P2, P4, P5, P6, P7	6	T3-1.1 & 1.2 T3-2.1 & 2.2
Mesozooplankton metabarcoding	Bongonet 180 µm	P1, P2, P4, P5, P6, P7	6	T3-1.1
Small mesozooplankton metabarcoding	Bongonet 64 µm	P1, P2, P4, P5, P6, P7	6	T3-1.1
Gelatinous zooplankton	MIK net 1500 µm & Bongonet 180 µm	P1, P2, P4, P5, P6, P7	105 (individuals)	T3-1.1 & 1.2 T3-2.1 & 2.2

Table 10. Overview of gear deployment

Gear	Sampling depth		Hauling speed (m/s)	
	Shallow	Deep	lowering	heaving
Multinet 180 µm	Bot-200-100-50-20-0m	Bot-600-50-20-0m*	0.5	0.5
Multinet 64 µm	Bot-200-100-50-20-0m	Bot-600-50-20-0m*	0.5	0.3
Bongonet 180 µm	Bottom-0m	1000-0m	0.5	0.5
Bongonet 64 µm	Bottom-0m	1000-0m	0.5	0.3
MIK 1500 µm	Bottom-0m	Bottom-0m	0.3**	0.6
Macrozooplankton trawl				

*At the deepest station (P7) time only allowed to sample down to 1000m

**If lowering to fast the net-bucket might flip into the net since the ring is much heavier than the bucket even when added weight to the bucket.

T3-1.1; 2.1; 2.2; 4.2; 4.4. Characterize biological mesozooplankton communities and seasonality in terms of biodiversity, abundance, biomass and distribution patterns (1.1), secondary production (2.1), trophic ecology (4.2) and sympagic-pelagic-benthic coupling (4.4)

Konrad Karlsson (post doc, UNIS), PI: Janne Søreide

The RF3 work package aims to describe zooplankton dynamics over season (summer, winter, and spring) and space (Atlantic, shelf, and Arctic). A further aim was to estimate grazing, egg production and hatching success of dominant zooplankton species. I participated on the cruise to conduct experiments on mesozooplankton at the three process stations: P1, P4, and P7. In addition, I took samples of zooplankton biomass and metabarcoding at six stations: P1, P2, P4, P5, P6, and P7. Three different experiments were planned prior to the cruise: (i) an experiment to estimate the grazing on phytoplankton and microzooplankton by the most dominant zooplankton, (ii) experiments to estimate the egg production and the hatching of eggs *from Calanus glacialis, Calanus finmarchicus,* and the egg production of *Pseudocalanus sp.*, (iii) an experiment to estimate respiration of the most dominant zooplankton species, and link the respiration to lipid storage and carbon nitrogen ration (C:N) of the animals.

Results: Biomass and metagenomics samples were taken at the six stations. The grazing experiments were conducted at the three stations, samples of chlorophyll-a, particulate organic carbon, and community composition (phytoplankton and microzooplankton) were taken to be analyzed later on. Egg production and hatching were estimated on board the ship. However, very few animals produced eggs, and none hatched. Experiments on respiration were unsuccessful because the Loligo sensor could not be calibrated. However, measurements of lipid storage and C:N ratio were taken.

T3-1.1; 2.1. Macrozooplankton

Padmini Dalpadado (IMR), PIs: Bodil Bluhm (UiT), Tove M. Gabrielsen (UNIS/ UiA)

Macrozooplankton consists of larger organisms such as euphausiids (krill), amphipods, arrowworms, jellyfish and larval fish. The biomass of these organisms is usually underestimated as they avoid smaller gears as well as can pass through the larger nets. In this project, we aim to combine acoustics with net catches to map distributions patterns and obtain biomass estimates/indices of key macroplankton such as euphausiids and amphipods. These organisms are key prey of many economically and ecologically important fish species in the Barents Sea. We use two types of nets, namely MIK (ring net 2m in diameter, 500µm at the cod end) and a specially designed macroplankton trawl (6*6m, 3mm mesh all throughout) to catch these organisms. As echosounders onboard operate with several frequencies we aim to use acoustic information (e.g. frequency response) together with net catches to recognize and quantify the organisms. The main aim of the August 2019 cruise was to identify key acoustic backscatters as we move from Atlantic (P1) passing through arctic waters (P2, P3 &P5) towards the mixed waters in the North (P5& P6).

Preliminary results show that at station P1 with Atlantic waters was dominated by large and small jellyfish (*Cyanea capillata*, *Mertensia ovum* and *Sarsia* spp.), euphausiids (*Meganyctiphanes norvegica*, *Thysanoessa inermis*) and some larval fish (Figure 8, Table 11). As we move towards artic waters, the species composition and diversity changed. The more Atlantic dominated species decreased already when reaching the P2 station. Especially in P3 and P4 stations, the larger arctic water associated amphipod, *T. libellula* was the most abundant in the macroplankton trawl. Echogram with plankton from P2 is shown in Figure 9. In the shallow arctic layer (50-100m) in P6 & P7, adult *Calanus hyperboreus* (CV-CVI) dominated. In the deeper waters (1000-2000m), we caught bright red colored organisms such as shrimp, *Hymenodora* and copepod, *Pareuchaeta* spp. In addition, large numbers of chaetognaths were present. It is noteworthy that some individuals from most of these groups were carrying eggs. The presence of young *Themisto libellula* (3-5mm-just released from adult

marsupium) also seem to indicate suitable growth conditions in these waters. In the shallow arctic hauls, we caught a lot of green material (likely from algal blooms higher up in the water column), indicating good feeding conditions for the young in these waters (P6 & P7).

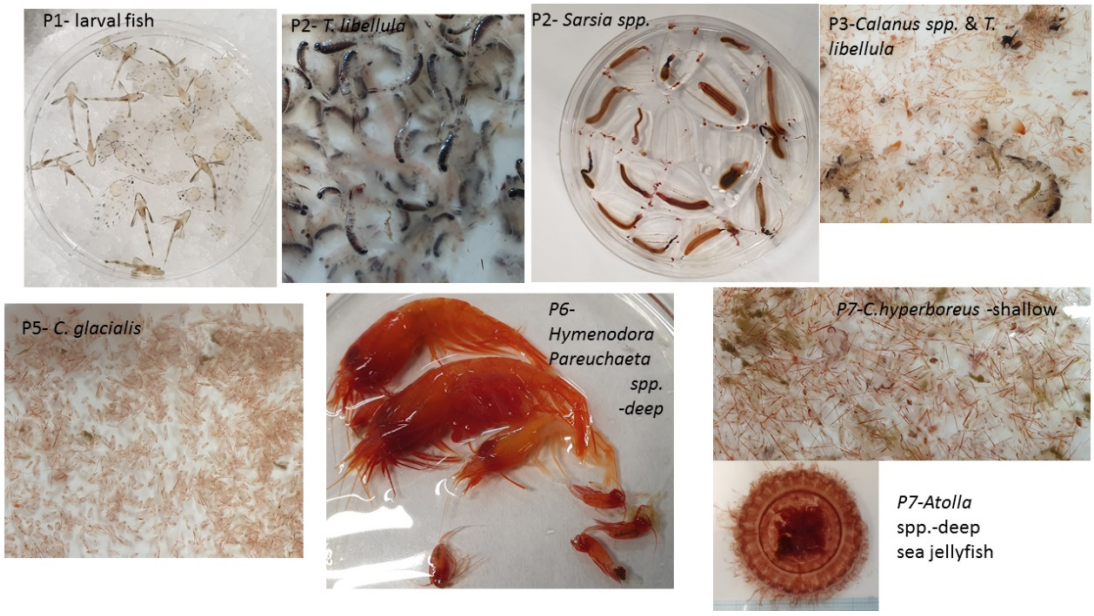


Figure 8. Images of organisms at different stations from a survey with R/V Kronprins Haakon, 5-27 August 2019

Table 11. Sampling description of Macrozooplankton & preliminary observations of taxa.

Sampled from maximum depth to surface, V-haul P1-P4, vertical P5 and P6.

Station	lat	lon	Net	Max. Depth (m)	Dominant organisms
P1	76.0196	31.2897	MIK	320	Jellyfish, *C. finmarchicus*, *C. glacialis*, *M. norvegica*, *T. inermis*, larval fish
	76.0361	31.0716	Macroplankton Trawl	300	Jellyfish, larval fish
P2	77.4990	33.9955	MIK	160	*T. libellula, Clione limacina C. glacialis, Limancina spp.*
	77.5163	34.0057	Macroplankton Trawl	160	*T. libellula*, *Clione limacina*, jellyfish
P3	78.75	34.0004	MIK	300	*C. glacialis*, Jellyfish, *T. libellula*(smaller)
P4	79.7077	34.2833	MIK	320	*C. glacialis*, *T. libellula*, *C. limacina*.
	79.4983	34.6344	Macroplankton Trawl	300	*T. libellula*, *Sagitta* spp., *C-limacina*
P5	80.5092	33.8602	MIK	140	*C. glacialis*, *T.libellula* (small)
P6 shallow	81.5514	31.1684	MIK	50	*C. hyperborus, T. longicoudata*
P6 deep	81.5765	31.3874	MIK	1000	*C. hyperborus , krill,* Hymenodora *spp, Pareuchaeta spp.*
P7 shallow	81.9283	29.1460	MIK	100	*C. hyperborus, T.libellua* (small)
P7 deep	81.9811	29.7287	MIK	2000	*C. hyperborus, Hymenodora* spp., *T. longicaudata.*

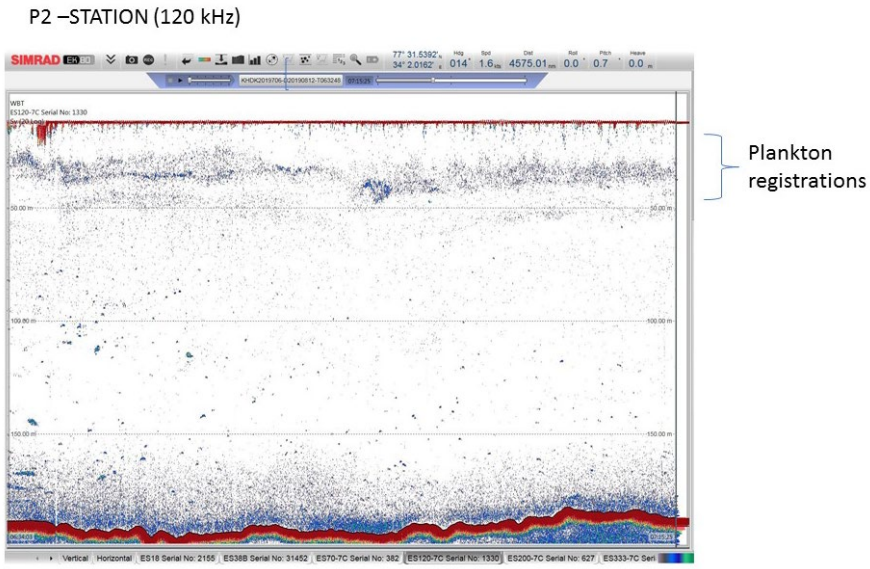


Figure 9. Echogram showing plankton registrations near P2 station.

T3-1.1; 1.2; 4.3; 4.4. Characterize and quantify biota in the seasonal ice zone (1.1), relate environmental conditions to biological communities (1.2), and explore the sympagic-pelagic-benthic coupling and trophic ecology of benthos (4.4)
Bodil Bluhm (UiT, PI), Arunima Sen (Nord University), Eric Jorda Molina (Nord University), with assistance by Yasemin Bodur (UiT), Karoline Saubrekka (UiO) and Jack Garnett (Lancaster University)

During Q3, our team contributed primarily to the Nansen Legacy RF3 tasks T3-1 and T3-4, specifically T3-1-1, T3-1-2, T3-4-3 and T3-4-4. The gear used to collect samples included a demersal Campelen trawl and a box corer.

Aims of the group were to (linked to PIs not onboard):

1. ***T3-1-1: Characterize and quantify biota in the seasonal ice zone*** by sampling sediment communities for biodiversity and abundance/biomass assessments, specifically microbes (PI Lise Øverås, UiB), benthic Foraminifera (PI Elisabeth Alve, UiO), multicellular meiofauna (PI Bodil Bluhm) and macro-infauna (PIs Paul Renaud, APN and Henning Reiss via PhD student Eric Jorda Molina, Nord University). Note that mega-epifauna sampling was conducted at the Nansen Legacy transect during JC1-2 in August 2018, but was moved to IMR's ecosystem cruise in 2019 where it is routinely done on a larger spatial scale.
2. ***T3-1-1: Characterize biota in the seasonal ice zone*** by collecting voucher material of benthic macro- and megafauna to be archived at the UiT Museum for a legacy of physical material of the project (PIs Bodil Bluhm, Andreas Altenburger UiT)
3. ***T3-1-2: Relate environmental conditions to biological communities*** by sampling for sediment properties (grain size), indicators of food availability (total organic carbon and nitrogen, sediment pigment amount) and food sources ($\partial^{13}C/\partial^{15}N$, pigment composition)
4. ***T3-4-4: Sympagic-pelagic-benthic coupling*** by sampling representative benthic invertebrate taxa and demersal fishes for stable carbon and nitrogen stable isotope analysis (PIs Bodil Bluhm, UiT and Lis Jørgensen, IMR, for shared PD to be hired)
5. ***T3-4-4: Sympagic-pelagic-benthic coupling*** by conducting sediment community respiration incubation experiments onboard (PI Paul Renaud, APN, with PD Arunima Sen and PhD student Eric Jorda, Nord Univ.)

6. ***T3-4-4: Sympagic-pelagic-benthic coupling*** by sampling sediment for IP_{25} analysis as an indicator of ice algal food available to the sediment communities (PI Marit Reigstad with PhD student Yasemin Bodur, UiT).
7. ***T3-4-4: Trophic ecology of benthos*** by sampling benthic meiofauna for molecular characterization of diets of small benthic invertebrates (PI Anna Vader, with PhD student to be hired, UNIS/ UiT).
8. ***RF4 T4-4: To contribute to the energy flow ECOPATH model*** by sampling benthic invertebrates for which wet weight-to-carbon conversion will be established (PI Torstein Pedersen, Bodil Bluhm, UiT)

Description of activities, samples collected

Sampling largely followed the Nansen Legacy sampling protocol version 4. We sampled demersal fish and epibenthos at P1, P2, P3 and near P4 from a single ~15 min Campelen 1800 trawl haul each (Table 13, Figure 10, top; 45 min at P1). Details on the trawling procedure are described in the fish section. Organisms were picked from the trawl haul both on deck and in the fish lab, identified to the highest practical taxonomic resolution, and either frozen (for later stable isotope analysis and wet weight-to-carbon analysis), or fixed in formalin or 70% ethanol (for the museum collection, depending on taxon), or 96% ethanol (to allow later molecular analysis of museum archived specimens). Wet weight-to-carbon conversions will feed into the ECOPATH energy flow model in RF4.

Figure 10. Sampling tools used for benthic sampling during Q3: Top: Campelen 1800 shrimp trawl. Bottom: giant box corer. Photo B. Bluhm.

Sampling for sediment parameters, organismal abundance and diversity as well as respiration experiments was done at stations P1, P2, P4, P5, P6, P7 and SICE4 using a 50x50 cm giant box core (owned by APN) (Figure 10, bottom). Three box core replicates were taken at each of those stations except station P5, where only one replicate was taken because rocks prevented the closing of the box core during three additional attempts. Given one of the core boxes became damaged we refrained from additional attempts. At station P6, one deployment did not reach the seafloor after drifting to >1000 m and was repeated at the target station depth (~ 850 m). At P6, P7 and SICE4, 4, 5 and 4 deployments were done, respectively, to retrieve 3 replicate samples.

Microbes were sampled in replicates of three (one per box core) with a 4.7 cm diameter core and sectioned into 1 cm layers up to 6 cm. The center of each section was taken out with a 60 ml syringe and the sediment placed into a sterile whirlpack bag and frozen at -80°C. Foraminifera and multicellular meiofauna were sampled in replicates of three with a 5.5 cm

diameter core, sectioned into the same layers, placed into Joni containers and preserved with 70% Bengal rose stained ethanol and stored at room temperature. Macrofauna samples were taken with 11.7 cm inner diameter cores and either sieved directly through a 0.5 mm sieve and preserved in 4% formaldehyde seawater solution, or sieved and preserved after incubation experiments. Given macrofauna samples matched incubation treatments, a total of 20 replicate cores were taken per experimental station, and for consistency also at non-experimental stations.
Sediment grain size, TOC, TON and $\Delta^{13}C/\Delta^{15}N$ samples were sampled in bulk using a 4.7 cm diameter core sectioned, again, into 1 cm layers to 6 cm as above in each of the three replicated cores. Sediment pigment (chlorophyll *a*, phaeopigments) samples were taken with the same size corer, but layers also included 6-8 cm and 8-10 cm. To assess pigment composition using HPLC analysis, a single sample per core was taken from the 0-2 cm layer using a 60 ml syringe and stored at -80°C as part of a collaboration with the CHAOS project in the UK's Changing Arctic Ocean program. The top 1 cm was sampled for IP_{25} analysis (parallel to sediment trap sampling) with a 60 ml syringe and stored at -20°C. One surface scrape each was taken for molecular analysis of diets of select meiofauna taxa (stored in 96% ethanol at -20°C), and for trace metal analysis from each box core. The remaining surface area was sieved through 0.5 or 1 mm mesh and organisms retrieved (mostly polychaetes) were identified to family level where possible and frozen at -20°C for later stable isotope analysis.

Sediment incubations for measuring bulk respiration rates were conducted with sediment retrieved from stations P1 (320 m depth), P4 (330 m depth), P6 (850 m depth) and P7 (3000 m depth). Therefor rates were measured at two shelf stations, one slope station and one deep water, basin station. All stations except P1 had some amount of ice at the water surface, although the ice was very patchy at P4.

At each station where incubations were conducted, about 100L of CTD water was collected early during activities at the station from the bottom and kept in the cold rooms in the dark to keep them at the temperature at which the incubations were conducted. The CTD data from both this year and the year prior were used for determining the temperatures at which incubations would be conducted. Negative temperatures were not possible to achieve in the designated cold rooms, therefore experimental temperatures did not completely match in situ conditions, however, we attempted to mimic seafloor conditions as much as possible while also maintaining observed inter-station variability. Two treatments were maintained at ambient water conditions: Treatment 1 (T1), with no added factors, and Treatment 2 (T2), where 30 g of isotopically enriched dried and resuspended algal powder was added to the sediment of the cores. Additionally, two treatments were maintained at temperatures about 4°C above ambient conditions, to simulate expected warming conditions. Treatment 3 (T3) paralleled T1 (no added factors, just warmer temperature) and Treatment 4 (T4) had algae added, similar to T2. For each treatment, 5 replicate cores were maintained. Due to time constraints and narrow sieving windows (sieving could only be conducted when no other activities were taking place), only T1 and T2 were conducted for P6 and P7. Table 12 lists the treatments and temperatures that were conducted at the various stations.

Table 12. Treatments and temperatures at which benthic community oxygen consumption experiments were conducted at the various stations.

Station	Treatment 1 (ambient temp)	Treatment 2 (ambient temp + algae)	Treatment 3 (ambient temp +4°C)	Treatment 4 (ambient temp +4°C + algae)
P1	5 replicates 2°C	5 replicates 2°C	5 replicates 6°C	5 replicates 6°C
P4	5 replicates 0°C	5 replicates 0°C	5 replicates 4°C	5 replicates 4°C
P6	5 replicates 0°C	5 replicates 0°C	none	none

P7	5 replicates 0°C	5 replicates 0°C	none	none

At P1 and P4, 20 sub-cores and at P6 and P7 10 sub-cores (sub-cores were 11.7 cm in inner diameter) were inserted into the sediment of the three box cores, filled with bottom water from the CTD and kept in the appropriate cold rooms. Cores were bubbled for 12 hours to saturate with oxygen following which 15-20 ml of overlying water was taken for quantifying nutrients. Algae was added to treatment 2 and 4 as close to the sediment as possible. Core tops with magnetic stir bars were fixed on, removing air bubbles, and connected to electric transformers to keep the bars stirring, in order to avoid stratification of the water in the cores. Oxygen measurements were taken every 6 hours via the PreSens Fibox 4 optical sensor system. Experiments were terminated when oxygen concentrations reached 15-30% of saturation levels (70% for P6 and P7), upon which, nutrient samples were taken once more from the overlying water. Cores were sieved on a 0.5 mm sieve and all macrofauna retained were fixed in 4% formaldehyde and rose Bengal. In treatments 2 and 4, prior to sieving for macrofauna, sub-sections of the first 2 cm of the sediment were taken with a cut off 60 ml syringe and frozen, to assess algal uptake by foraminiferans.

For each sample type, a separate metadata excel sheet was created using the SIOS excel template generator. UUIDs were assigned to each sample following the Nansen Legacy guidelines. Sediment cores for respiration incubations were given a UUID through the system, but no labels were generated since these cores did not have a physical form after incubations were terminated. However, macrofauna samples, nutrient samples and meiofauna samples (post-incubations) were taken from these cores and all these samples had UUIDs and appropriate labels, with the parent UUID being the generated, but label-less UUIDs for the incubation cores.

Table 13. Overview over stations sampled for each of the different activities. Numbers in parentheses indicate the number of sediment layers.

				Station / number of replicates / treatments for incubation							
Sample type	Task	PI/responsible	Institution	P1	P2	P3	P4	P5	P6	P7	SICE4
Sediment microbes	T3-1-1	L. Øvreås	UiB	3 (6)	3 (6)	-	3 (6)	1 (6)	3 (6)	3 (6)	3 (6)
Meiofauna	T3-1-1	E. Alve	UiO	3 (6)	3 (6)	-	3 (6)	1 (6)	3 (6)	3 (6)	3 (6)
Macrofauna	T3-1-1	P. Renaud/H. Reiss, E. Jorda	APN / Nord	20	20	-	20	7	20	20	20
Museum lots	T3-1-1	B. Bluhm	UiT	24	18	12	10	10	7	10	3
Grain size, TOC/TON, d13C/d15N	T3-1-2	E. Alve	UiO	3 (6)	3 (6)	-	3 (6)	1 (6)	3 (6)	3 (6)	3 (6)
Sediment Chl / phaeopigments	T3-1-2	P. Renaud	APN	3 (8)	3 (8)	-	3 (8)	1 (8)	3 (8)	3 (8)	3 (8)
Sediment pigment compositon	T3-1-2	P. Renaud / UK CHAOS	APN	3(1)	3(1)	-	3(1)	1(1)	3(1)	3(1)	3(1)
Organisms $\delta^{13}C/\delta^{15}N$	T3-4-4	B. Bluhm / L. Jørgensen	UiT / IMR	28 taxa	46 taxa	27 taxa	24 taxa	16 taxa	18 taxa	6 taxa	12 taxa
Incubation experiments	T3-4-4	P. Renaud / A.	APN / Nord	4 T/5 R	-	-	4 T/5 R	-	2 T/5 R	2T/5R	-
Nutrients pre-incubations	T3-4-4	P. Renaud / A. Sen	APN / Nord	4 T/5 R	-	-	4 T/5 R	-	2 T/5 R	2T/5R	-
Nutrients post-incubations	T3-4-4	P. Renaud / A. Sen	APN / Nord	4 T/5 R	-	-	4 T/5 R	-	2 T/5 R	2T/5R	-
Meiofauna post-incubation	T3-4-4	E. Alve	UiO	2 T / 5 R (2)	-	-	2 T / 5 R (2)	-	1 T/5 R	1 T/5 R	-
Sediment IP_{25}	T3-4-4	M. Reigstad / Y. Bodur	UiT	3(1)	3(1)	-	3(1)	1(1)	3(1)	3(1)	3(1)
Meiofauna molecular diet	T3-4-4	A. Vader	UNIS	3(1)	3(1)	-	3(1)	1(1)	3(1)	3(1)	3(1)
Wet weight-to-carbon conversion	RF4	T. Pedersen / B. Bluhm	UiT	11 taxa	23 taxa	12 taxa	8 taxa	8 taxa	-	-	-
Trace metals	RF2	M. Adelan / N. Sanchez	NTNU	1 (1)	1(1)	-	3(1)	1(1)	3(1)	3(1)	3(1)

Field observations

Epifauna

Although trawls were not quantitatively analyzed during Q3, we note that - as last year - the most frequent epifaunal invertebrates across most trawl stations included the shrimp *Sabinea septemcarinata*, the sea cucumber *Molpadia borealis*, soft corals from the family Nephtheidae (*Gersemia* sp. likely) and the sea star *Ctenodiscus crispatus*. P2 was the most taxon rich of the four trawl stations. The harvested shrimp *Pandalus borealis* was abundant and dominant at Stations P1 and P4; Pycnogonids and *Polymastia* sponges were also common at these two stations (Figure 11, top). In contrast to last year, the brittle star *Ophiura sarsii* was not particularly abundant or frequent.

Figure 11. Example of trawl catch and sediment sample. Photo B. Bluhm.

Sediment

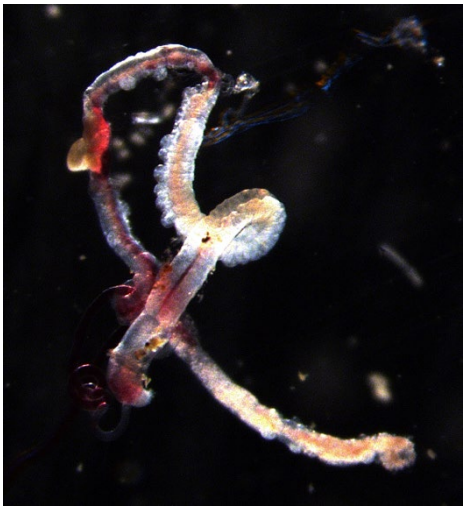
Sediment texture and color varied both between sites and particularly down core. In all cores, surface sediments were brownish in coloration, with variations from creamy to chocolatey (Figure 11, bottom). Under the soft layer was a clay layer that was very dense in some cases. Station P4 had particularly soft sediment and stripes of different sediment colors. Station P5 had much gravel and boulders providing a substrate for limpids, *Lepeta caeca* to attached; coarse sediment was incorporated into tubes of, for example, the polychaete *Nothria conchilega*.

Macroinfauna

In most cores, polychaete tubes were visible on the surface, and – in the case of *Spiochaetopterus* - extended into the clay layer. At shelf stations (P1, P2, P4 and P5) representatives of the polychaete families Lumbrineridae, Maldanidae, Nepthydae and Spiochaetopteridae were quite abundant. Different types of Bryozoans were also present at some cores along the shelf.

At the slope at P6, the sediment surface contained clumps of sponge spicules. Isopods, amphipods, and cnidarians *Umbellula* and Pennatulacea were visible. Spionid polychaetes were also

present together with Maldanidae, Ampharetidae and Trichobranchidae individuals.



At the deep, P7 station, frenulate siboglinid worms were recovered and extraction from the tubes revealed the genus to be *Siboglinum* (Figure 12). These are polychaetes with obligate internal chemosynthetic bacterial symbionts.

Figure 12. Siboglinum sp. found at basin station P7. Photo A. Stippkugel

Black sediment was observed in parts of the box cores from this station, which could be indicative of reducing conditions, which would align with the presence of siboglinid worms that require access to reduced chemicals in sediment porewater for nutrition. At P7, one core contained an empty shell of the irregular sea urchin *Pourtalesia geoffreyi*. At both P7 and SICE4 foraminifera appeared to be numerically abundant. At SICE4 some individuals of Lumbrineridae, Trichobranchidae and Sabellidae were retrieved, although abundances appeared to be even lower than at P7.

Respiration experiments

Differences in respiration rates were observed between the cold, ambient treatments, and the warmer treatments (example in Figure 13).

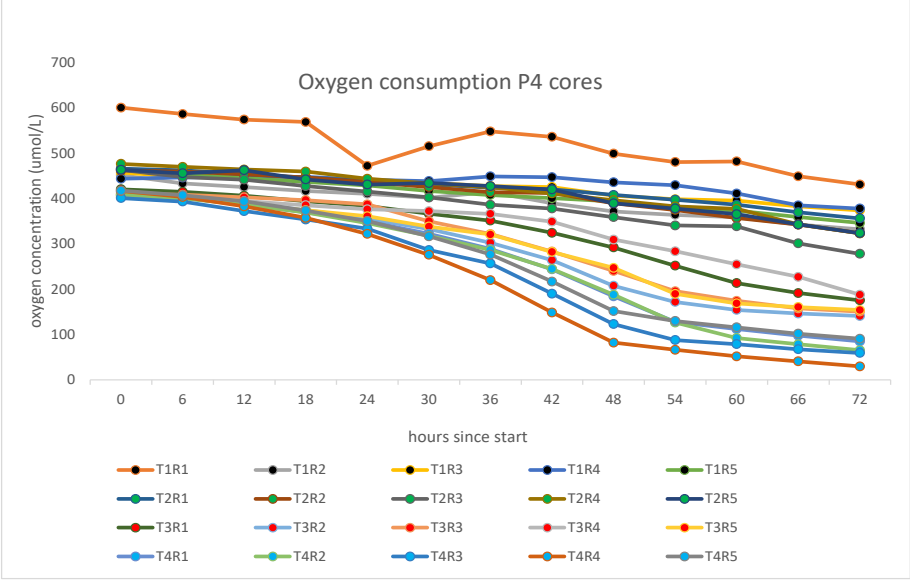


Figure 11. Example of respiration results for whole community sediment cores (from P4). T = treatments. T1 (black circles) is at ambient temperature, T2 (green circles) is at ambient temperature with the addition of isotopically enriched algal food, T3 (red circles) is at ambient temperature + 4 degrees C, and T4 (blue circles) is at + 4 degrees C and with isotopically enriched algae added.

Algal treatments at some stations appeared to experience higher respiration rates than the non-algal treatments at the same temperature. Detailed analyses need to be carried out to determine whether the differences were significant or not. It should be noted that upon termination of the experiments, it was observed that the added algae were still highly visible

and present in the sediment. Further work will determine whether and to what extent both the macrofaunal and meiofaunal components of the community incorporated the added algae.

Cores where relatively large animals were clearly visible appeared to have relatively high respiration rates (e.g., cores in which *Gersemia* was clearly present).

Links to other tasks / RFs / RAs / projects
The field activities contribute to most other work packages in the Nansen Legacy. The Foraminifera objective extends to RF1, because both recent and palaeo analyses are performed on the cores. The trace metal sediment samples contribute to RF2. The wet weight-to-carbon conversions and biotic biomasses will serve as input data to the food web and energy flow models in RF4. Our data and sample archival is a component of RA-B, and our blogs and the museum voucher collection contribute to outreach objectives in RA-D. Sediment pigment analysis via HPCL is a collaboration with the UK CHAOS project.

T3-1.3 Stable isotopes, fatty acids & HBIs of POM, zooplankton & fish

Anette Wold, NPI, Kaisa Dmoch, IOPAS, PI: Philipp Assmy (NPI)

Purpose
Stable isotopes, fatty acids & HBIs of POM, main zooplankton taxa will be used to study coupling/de-coupling of sympagic and pelagic primary and secondary producers. In addition fatty acids (together with C/N ratios) will be used as a measure of food quality for the planktonic grazer communities and will be linked to on board grazing experiment.

Description of work
Stable isotopes, fatty acid and HBI samples have been taken for POM from the Chl max from stations P1, P2, P4, P5, P6 & P7 and from the bottom 10 cm of the ice core at two ice stations (P6 ice & P7 ice). We filtered between 1.2-2.8L from Chl max in order to get enough material, three replicates were taken for each sample type. For the ice core we were restricted to one replicate due to very little biological material.
Samples for all three parameters were also sampled from the main mesozooplankton & microzooplankton taxa (Table 14). This work was done in collaboration with the Ecotox group (Julia Giebichenstein and Robynne Nowicki). Stable isotopes will be analysed at UiO. while fatty acids will be analysed by Doreen Kohlbach, NPI. In the southernmost stations the water mass was quite homogenous, and samples were taken from the entire water column, while at the two off shelf stations (P6 & P7) samples were taken from the surface arctic layer and from the deeper Atlantic layer.

Table 14. Overview of fatty acid and HBI samples (overview of the stable isotope samples is given in the Ecotox section).

Gear Type	Station	Depth	Taxon
MIK-net 1500 µm WP2 90 µm	P1	300-0m	*Calanus glacialis, C. hyperboreus* *Sagiitta* spp. *Mertensia ovum* *Beroe cucumis* *Sarsia* sp. *Catablema visicarium* *Aglanta digitale* *Sagitta elegans* *Meganyctiphanes norvegica* *Thysanoess* spp.
MIK-net 1500 µm WP2 90 µm	P1	70-0m	*Oithona similis* *Pseudocalanus* spp. *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Beroe cucumis* *Mertensia ovum* *Meganyctiphanes norvegica*
MIK-net 1500 µm WP3 1000 µm	P2	150-0m	*Metridia longa* *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Limacina helicina* *Clione limacina* *Sagitta elegans* *Themisto libelulla* *Thysanoess* spp. *Bougenvilla supercillaris*
Macroplankton trawl MIK-net 1500 µm Bongonet 180 µm	P4	320-0m	*Oithona similis* *Metridia longa* *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Limacina helicina* *Clione limacina* *Sagitta elegans* *Apherusa glacialis* *Themisto libelulla* *Thysanoessa inermis* *Meganyctiphanes norvegica* *Oikopleura vanhoffeni*
Bongonet 180 µm	P5	140-0m	*Oithona similis* *Microcalanus spp.* *Pseudocalanus spp.* *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Metridia longa*
MIK-net 1500 µm	P6	50-0m Arctic	*Calanus hyperboreus* *Euchaeta glacialis* *Oikopleura vanhoffeni* *Eukhronia hamata* *Themisto abyssorum* *Thysanoessa longicaudata*
MIK-net 1500 µm Bongonet 180 µm	P6	400-0m Atlantic	*Calanus finmarchicus* *Ostracodes* *Themisto abyssorum* *Triconia borealis* *Aglantha digitale*

MIK-net 1500 µm Multinet 180 µm	P7	1000-0m Atlantic	*Pseudocalanus spp.* *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Eukrohnia hamata* *Sagitta maxima* *Ostracodes* *Themisto abyssorum* *Thysanoessa longicaudata* *Meganytiphanes norvegica* *Hymenodora glacialis*
Bongonet 180 µm	P7	100-0m Arctic	*Oithona similis* *Microcalanus* spp. *Calanus finmarchicus, C. glacialis, C. hyperboreus* *Onceidae* *Ostracodes* *Cyclocaris guilelmi* *Thysanoessa longicaudata* *Themisto abyssorum*

T3-2.2. Measure how current environmental settings drive the phenology of primary and secondary production, and test how changing conditions may affect these seasonal patterns

Christine Gawinski (UiT), PI: Camilla Svensen (UiT)

The goal of this task is to identify and quantify how environmental conditions influence the phenology of production cycles both on the community and species levels. During the cruise in August 2019 the focus was on the small planktonic copepod *Oithona similis* which is often underrepresented in traditional zooplankton surveys due to the use of coarse plankton nets, which *Oithona* can easily pass through. To assess the relative importance of this copepod species in the ecosystem of the Barents Sea and Arctic Ocean, the production of this species was experimentally determined through egg incubation experiments. Assuming that female copepods allocate their ingested carbon into egg production rather than into growth, the specific egg production rate can be used as an estimate of the production of the population. To assess how population dynamics vary across space, egg incubation experiments were set up at three stations, namely P1, representing Atlantic conditions, P4, based on the shelf and P7, representing Arctic conditions.

According to protocol, 30 females of *Oithona similis* should be incubated per station at the *in situ* water temperature in the surface layer. The incubation temperatures were as follows: 3 °C (P1), -1.5 °C (P4) and -1.5 °C (P7). At stations P1 and P4 very few *Oithona* with eggs were found. Therefore, the incubation was set up with only 19 instead of 30 individuals at station P1. At station P4 the incubation was started with an initial number of 22 individuals and another 8 females were added after 12 h, as the picking of copepods with egg sacks took some hours. At station P7 females with eggs occurred in abundance, therefore 30 individuals could be used for the incubation from the beginning. At each station the experimental animals were photographed in the first 48 h, to determine the prosome length and clutch size of each female. The incubation chambers were checked every 12 h for newly hatched nauplii. In case of a hatching event the exact hatching time and number of hatchlings was noted and the nauplii were removed from the incubation chambers. The duration of the experiment at P1 was 408 h, at P4 276 h and at P7 108 h.

At station P1 a total of 219 nauplii hatched from 17 of the 19 females (89 % hatching rate). The maximum number of nauplii per hatching event was 21 nauplii and the maximum number of nauplii hatched per female was 23. The earliest hatching event occurred after 36 h and the last hatching event after 408 h. One copepod died after 252 h and another one after 408 h. At station P4 209 nauplii hatched from 13 of the 30 females (43 % hatching rate). The maximum number of nauplii per hatching event was 27 nauplii and the maximum number of nauplii

hatched per female was 29. The earliest hatching event occurred after 24 h and the last hatching event after 276 h. None of the copepods died, however one was lost during sampling. At station P7 18 nauplii hatched from 1 of the 30 females (3 % hatching rate). The hatching event occurred after 48 h. None of the copepods died, however one was lost during sampling.

The timing of the reproductive cycle will be determined across the annual cycle based on the set of four seasonal cruises, with three yet to come.

To investigate *Oithona's* position in the food web, samples for carbon, stable isotope and fatty acid analyses were taken at each of the three process stations. According to protocol, 100 female *Oithona* should be picked for Carbon analysis after their egg sacks have been removed. Because of the low abundance of females with eggs at stations P1 and P4, two times 100 *Oithona* were randomly picked from the sample (all without egg sacks) and 30 individuals were photographed to determine their size and developmental stage. At station P7 two times 50 females and in addition two times 50 egg sacks were sampled for Carbon analysis. At each station three times 50 *Oithona* were picked for stable isotopes and fatty acid analyses. To investigate a possible top-down control of *Oithona* on the microbial food web, a grazing experiment was conducted in collaboration with Oliver Müller and Lasse Olsen. In addition to their incubations of 0.8 µm, 3 µm and 90 µm filtered sea water, 20 *Oithona* were added in three replicates to 1 l of 90 µm filtered sea water. To compare the feeding strategies of *Oithona* with that of larger copepods, a treatment with three *Calanus sp.* was added in three replicates. Samples were incubated for 6 days, after which each copepod was removed from the sample to be photographed (size and developmental stage determination, dead/alive). The grazing experiment was performed at three stations, namely P1, P4 and P6, at the same temperatures as the egg incubation experiments (3 °C P1, -1.5 °C P4 and -1.5 °C P7).

T3-3.1; 4.2. Estimate ranges of annual production along environmental and latitudinal gradients (3.1) and Trophic ecology of key zooplankton (4.2)
Angela Stippkugel (NTNU), PI: Rolf Gradinger (UiT), Janne Søreide (UNIS)

Experiments for selective grazing of micro- and mesozooplankton were conducted on board RV Kronsprins Haakon along a south-north gradient in the Barents Sea at three process stations (P1, P4 and P7) that were assigned as experimental stations.
To set up experiments, two CTD casts were taken from the deep chlorophyll maximum (DCM): i) 20 litres of seawater were collected to prepare 0.2 µm filtered seawater for the dilution and ii) up to 50 litres of seawater were collected and immediately pre-screened through a 180 micrometer sieve to exclude random mesozooplankton in the incubations. To prevent delicate organisms from damages seawater was sampled from the CTD by means of the funnel-transfer technique (Loeder et al., 2010). Filtered and unfiltered seawater was stored cool until use. In addition, a WP2 net with a 90 µm mesh size was taken to sample mesozooplankton from the integrated water body (0-70 m). Cyclopoid copepods *Oithona* spp. (mixture of *O. similis* and *O. atlantica*) and calanoid copepods *Calanus* spp. (mixture of *C. glacialis* and *C. finmarchicus*) were selected using a dissecting microscope (Leica M205C) in the chilled room 301 and stored in seawater of ambient temperature thereafter.
Two-point dilution experiments (Morison and Menden-Deuer, 2017) modified after Landry and Hassett (1982) were set-up using the collected seawater from the CTD casts. By means of dilution experiments the phytoplankton net growth rate μ and the instantaneous growth rate μ_0 excluding the grazing impact of micro- and mesozooplankton can be calculated. As microzooplankton grazing pressure can have a strong influence on the phytoplankton standing stocks (Irigoien et al., 2005), effects obscured by grazing pressure are likely to become visible in μ_0.
Dilutions of 10 and 100% were set-up in 2.5 litre carboys. 10% dilutions contained a mixture of unfiltered to sterile filtered seawater in a 1:9 ratio. 100% dilutions contained undiluted seawater with natural phyto- and microzooplankton communities. In addition, two treatments using 100% unfiltered seawater with i) around 100 *Oithona* spp. and ii) 5 *Calanus* spp. were added as mesozooplankton grazer treatments. The 10% dilution served as a control for phytoplankton growth since the number of grazers is considered as neglectable in the 10% dilutions. A control treatment was added with extra nutrients (f2 medium) to account for nutrient depletion in natural seawater in different seasons.
Incubation bottles were set up in triplicates and placed in a cool room adjusted to the *in-situ* seawater temperatures at sampling depth (between -1.5 to 2 °C). Squared, transparent 2.5 litre plastic bottles were used for the incubations. At P1, a plankton wheel with a jet pump was used to rotate bottles and to keep the incubated water inside the bottles in motion to prevent organisms from settling. Unfortunately, the water that circulated through the jet pump was heated up to 25 degrees and ruined the experiments at the first station. To prevent this mistake from happening again, bottles were placed horizontally in a shelf at P4 and P7 and manually rotated every 5 to 8 hours. Bottles were incubated in a 24 hours light cycle to simulate natural summer conditions. The grazing experiments were terminated after 24 to 48 hours. Different incubation times were chosen to account for temperature-dependent metabolism of grazers.
Growth rates of phytoplankton will be obtained using pigment measurements and phytoplankton counts. Phytoplankton net growth rate μ will be calculated using an exponential growth model (Landry and Hassett, 1982). To account for total grazing and selective grazing patterns of micro- and mesozooplankton, pigment samples before and after the incubations will be compared and phytoplankton and microzooplankton cell counts obtained using Uthermoehl sedimentation and inverted microscope techniques. Nutrient concentrations before and after incubations will be measured. In addition to the quantification of prey items and biomass, stoichiometry (C:N:P) will be measured.

T3-2.2; 4.4. Measure how current environmental settings drive the phenology of primary and secondary production, and test how changing conditions may affect these seasonal patterns (2.2) and Sympagic-pelagic-benthic coupling (4.4)

Yasemin Bodur, Miriam Marquardt, Martí Arumi-Amargant, Marit Reigstad, PIs: Camilla Svensen (UiT), Lis Lindahl Jørgensen (IMR)

Sediment trap deployment and sampling: To assess the vertical flux at the P-stations along the cruise transect, short-term sediment traps (KC-Denmark) were deployed at 5 locations up to 25 h (Table 15). At all stations except for P5, 4 trap cylinders (1.8l volume) were deployed at 30, 60 and 200m and 2 cylinders at 40, 90 and 120m, respectively (Figure 14). At 5, 20, 40, 60, 90m and Chl a max, bottles for the assessment of primary production were deployed (see report from M. Amargant-Arumi). Due to the shallow depth of P5, no cylinders were deployed at 200m and 4 traps were deployed at 120m. Prior to the deployment, the cylinders were filled with filtered deep water (below 200m) from the corresponding station or from a prior station to make sure that the water within the cylinders had a higher density than at the sampling depths. An anchor of 35kg was fixed to the bottom of the mooring to keep it upright in the water column. To keep the traps neutrally buoyant in the water, 3 large buoys were attached at 10 and 5m (Figure 14). A flagged pole equipped with an AIS beacon was used to mark the location of the mooring and to relocate its position for recovery. A small buoy with a long rope was attached to the pole for the recovery of the mooring. At the ice-covered stations (P4, P5, P6, P7) a chain was added between 10 and 5m to protect the rig from sea ice, while at P5, P6 and P7 the mooring was deployed on an ice floe where it was attached by an additional chain on two metal poles that were hammered into the ice (Figure 15).

Table 15. Overview of sediment trap stations during AeN Seasonal Q3 with deployment and recovery time, and the total time of deployment.

Station	Deployment time (UTC)	Recovery time	Total time deployment	Deployment conditions
P1	08.08.2019 22:15	08.08.2019 23:48	25 h 33 min	In open water
P4	13.08.2019 21:45	14.08.2019 17:51	20 h 6 min	Under ice conditions, in the water
P5	15.08.2019 20:00	16.08.2019 16:40	20h 40min	On an ice floe
P6	18.08.2019 11:30	19.08.2019 06:39	19 h 9 min	On an ice floe
P7	21.08.2019 01:00	22.08.2019 23:45	22 h 45 min	On an ice floe

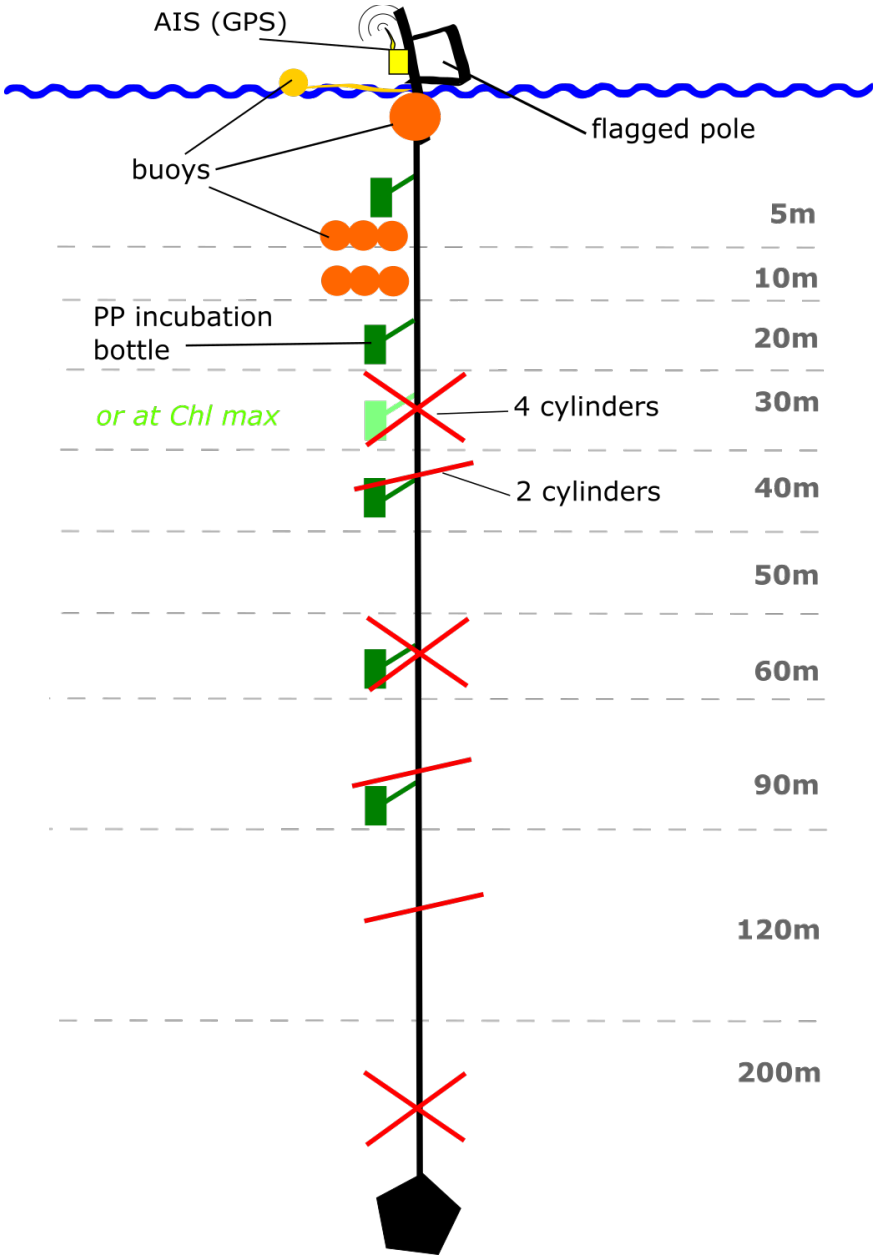


Figure 14. Scheme illustrating the structure of the mooring and the sampling depths of the sediment traps at open water conditions. At 30m, incubation bottles for primary production were deployed when the Chl a max was already covered at another depth.

Figure 15. Deployed sediment trap under ice conditions (left) and on an ice floe (right).

Sampling largely followed the Nansen Legacy sampling protocol version 4. Upon recovery of the sediment traps, the cylinder content of each depth was pooled and partitioned. From each depth, water was filtered for triplicate POC/PON analyses on pre-combusted GF/F filters and for size fractionated algal pigments (total Chl a (in triplicates on GF/F filters) and Chl a >10µm; on Polycarbonate filters) and water samples were taken for microscopic counts of fecal pellets and phytoplankton communities. Filters for algal pigments were immediately stored in Ethanol at 4C and measured with a fluorometer on board ideally after 12-24 h. Fecal pellets were preserved in a hexamine-buffered 4% Formaldehyde solution and phytoplankton communities in GA-Lugol. At 30, 60 and 200m depth additional triplicate samples were filtered for stable isotopes (pre-combusted GF/F), HPLC and IP25 analyses (GF/F). Approx. 1l was filtered for DNA analyses. through sterivex filters. DNA and HPLC samples were stored at -80C. POC/PON, stable isotopes and IP25 samples were stored at -20C.

Sea ice work

Organized by Anna Vader (UNIS), Miriam Marquardt (UiT)

Sea ice work were organized to optimize sampling efficiency, and the entire group helped out. Two sea ice coring teams, 1 team making hole for under-ice sampling and 1 melt pond team were supported by a team transporting cores to the ship, two teams handling cores in the lab preparing for the different analysis, 2 polar bear guards on the ice and 3 watches on bridge. The chief scientists coordinated the sea ice work with the crew and safety personnel, and the sea ice safety responsible checked the ice floe prior to the sea ice work.

Description of the sea ice work:
Ice cores were collected within a 10x10m grid by two or three teams of 3-4 people each, equipped with 9 cm Kovacs ice corers. Bio-bulk, meiofauna and one temperature/salinity and one nutrient ice core were sectioned every 10 cm (additionally, the lowest 10 cm of the bio-bulk and meiofauna cores were cut into 0-3 and 3-10 cm sections). Both the bio-bulk and meiofauna cores were cut under low light exposure inside a tent and sections stored in round plastic containers protected from the light. The temperature of the ice core was measured directly on the ice, before the core was sectioned for salinity measurements. Two cores (Stratigraphy and Back-up) were bagged in long plastic sleeves and taken back as entire cores. For all cores that were taken, snow depths, ice thickness free board and core length were measured. Coring work took 6 hours at P6_ice 4.5 hours at P7_ice and 4 hours at SICE4. At all times two polar bear guards were on the ice. In addition, there were three polar bear guards on the bridge. Simultaneously, a team of 2-3 people made a hole in the ice large enough to deploy a GoFlow bottle to collect water from under the ice at 0.5m depth. A third team of 2-3 people collected water from melt ponds using a bucket. Three separate melt ponds were sampled at both P6_ice and P7_ice. No melt ponds were sampled at SICE4. All water samples were protected from the light by covering the canisters using black garbage bags. Ice core sections from bio-bulk and meiofauna cores were mixed with sterile filtered sea water (0.22µm) in a ration of 100ml per one cm core and slowly thawed in the dark in a moderately warm room (ca. 10°C, fish lab).

Table 17. Sea ice sampling for microbes from sea ice cores (see text for abbreviations)

Stn	Depth (m)	Metabarcoding	Virus diversity	Phytoplankton net	Vivaflow	SEM	Cultures	Chl. *a*	FCM	Microscopy	POC/PON	XRF	Metatranscriptom	Bacterial	Primary	Nitrogen uptake	P vs. I curves	Nutrients
P6ice																		
	0-3	x					x	x	x	x	x			x	x	x	x	x
	3-10	x					x	x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x							x
	130-top	x						x	x	x				x				x
	0-10		x			x/X						x						
	UIW 0.5	x		x	x	x/X	x	x	x	x	x	x		x				x
	MP1	x			x	x/X	x	x	x	x	x	x		x				x
	MP2	x				x		x	x	x	x	x		x				x
	MP3	x				x		x	x	x	x	x		x				x
	MPM							x							x	x		x
P7ice																		
	0-3	x					x	x	x	x	x			x	x	x	x	x
	3-10	x					x	x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x			x				x
	0-10		x			x/X			x			x		x				
	UIW 0.5	x		x	x	x/X		x	x	x	x	x		x				x
	MP1	x		x	x	x/X	x	x	x	x	x	x		x				x
	MP2	x		x		x		x	x	x	x	x		x				x
	MP3	x		x		x		x	x	x	x	x		x				x
	MPM														x	x		
SICE4																		
	0-3	x						x	x	x	x			x				x
	3-10	x						x	x	x	x			x				x
	10-20	x						x	x	x	x			x				x
	20-30	x						x	x	x	x			x				x
	30-50	x						x	x	x	x			x				x
	50-70	x						x	x	x	x							x
	70-90	x						x	x	x	x							x
	90-110	x						x	x	x	x							x
	110-130	x						x	x	x	x							x
	130-150	x						x	x	x	x							x
	150-top	x						x	x	x	x			x				x
	0-10		x			x/X						x						
	UIW 0.5	x		x		x/X		x	x	x	x			x				x

List of parameters (and abbreviations used in Table 17) sampled from sea ice cores at the Q3 sea ice stations. For PI´s for the different datasets, see data report.

Biodiversity

- Genetic identification of community composition of protists and prokaryotes (Metabarcoding)
- Genetic identification of (free) virus diversity (Virus diversity)
- Qualitative analyses of protists >10 µm from net hauls (Net)
- Qualitative analyses of small protists for cultures and electron microscopy from water (Vivaflow)
- Qualitative and quantitative analysis of plankton including coccolithophores by scanning electron microscopy (SEM)
- Algal diversity by culturing (Cultures)

Abundance and biomass

- Algal biomass (total and >10 µm chlorophyll a concentration Chl *a*)
- Abundance of bacteria, virus, pico and nano-plankton by flow cytometry (FCM)
- Quantitative analyses of protists from water samples by light microscopy (Microscopy)
- Particulate organic carbon and nitrogen (POC/PON)
- Elemental composition of seston (XRF, particulate C:N:Si:Ca:P:Mg:S:K:Fe)(XRF)

Activity

- Genetic identification of protist activities (Metatranscriptome)
- Bacterial production
- Primary production
- Nitrogen uptake by primary producers
- Primary producer's response to light intensity

T1-2.2 Physical sea ice conditions

PI: Sebastian Gerland (NPI)

For each core, snow depth, core length and freeboard were measured. Two cores were taken for physical properties: 1) physical parameters including temperature and salinity measured on ice, and 2) stratigraphy (core described by layering, and packed for later analysis).

T3-1; T3-4 Sea ice microbes: biodiversity, abundance, biomass, distribution and activity.

Oliver Müller (UiB), Lasse Olsen (UiB), Miriam Marquardt (UiT), Martí Amargant (UiT), Bente Edvardsen (UiO), Karoline Saubrekka (UiO), Anna Vader (UNIS), PIs: Bodil Bluhm (UiT), Gunnar Bratbak (UiB)

Sea ice samples were collected at three stations; P6, P7 and SICE4. Sea ice thickness at the three stations varied between 130 and 160cm (Figure 16). Only core parameters were collected at SICE4, while P6_ice and P7_ice were full stations. Sampling included ice-cores (Figure 16) and water from under the ice (0.5m depth, sampled through a hole in the ice) as well as melt-ponds. In addition, a handheld phytoplankton net was used to collect samples from under ice (5-0m depth) and melt-ponds (only P6_ice and P7_ice). Table 16 shows an overview of which samples were collected (number of ice cores). Bio bulk samples were cut into sections which were pooled, and divided into sub-samples for metabarcoding, flow cytometry, chlorophyll *a*, POC/PON and bacterial production. All ice core samples were cut on the ice and processed on board, except "backup core" and "physics (stratigraphy)" which were stored whole and frozen for later analyses. A CTD profile was obtained from under the ice using a handheld SAIV204 CTD equipped with fluorescence sensor. Light was measured using a LiCOR light-profiler.

Figure 16. More than 30 sea ice cores were drilled to provide enough material for all the parameters. Photo: Christian Morel (christianmorel.net).

Table 16. Overview of ice cores collected for sampling of the different parameters at the sea ice stations.

	P6_ice	P7_ice	SICE4
Ice-cores			
P versus I	2	2	
Primary production	2	2	
Bio bulk	5	5	5
Phytoplankton experiment	2	2	
Ice-algae taxonomy	1	1	
Meiofauna/algae	3	3	3
SEM	1	1	1
backup core	1	1	1
XRF	3	3	3
Virus	3	3	3
nutrients	1	1	1
physics (temperature/salinity)	1	1	1
physics (stratigraphy)	1	1	1
HBI	1	1	
fatty acids	1	1	
stable isotopes	1	1	
DOM/trace metals	2	2	
PFAS	4	4	
Under ice water (0.5m depth)			
nutrients	x	x	x
bio bulk	x	x	x
primary production	x	x	
phytoplankton taxonomy	x	x	x
XRF	x	x	
SEM	x	x	
PFAS	x	x	
DOM/trace metals	x	x	
coccolithophore diversity	x	x	
phytoplankton net (5-0m)		x	x
Meltponds (3 ponds)			
nutrients	x	x	
bio bulk	x	x	
primary production	x	x	
phytoplankton taxonomy	x	x	
XRF	x	x	
SEM	x	x	
PFAS	x	x	

DOM/trace metals	x	x	
coccolithophore diversity	x	x	
Vivaflow/cultures	x	x	
phytoplankton net		x	

Transport and biogeochemical cycling of PFAS
Jack Garnett, Lancaster University, UK, EISPAC, CAO project

The aim of my research is to better understand the transport and biogeochemical cycling of perfluorinated alkylated substances (PFAS) to and within the Arctic environment. My sampling program focused on sea ice, but also consisted of surrounding material such as snow, melt ponds and under-ice seawater. These were collected at two sites with different ice thicknesses with potentially contrasting ice types. Data will be able to improve our knowledge on the importance of snow and ice as temporary storage of pollutants whilst also indicating the significance of pollutants derived from the atmosphere and ocean. Moreover, this data will yield valuable information on the exposure to sympagic organisms located at the base of the marine food web.

Tasks and responsibilities
During my time on board the KPH, I maintained a list of the chemical inventory and ensured items were fastened securely (see also list on upgrades). In the beginning of the expedition, I shared the large workload of the benthos team to sieve samples and prepare experiments.
I also contributed a short blog highlighting the importance of studying contaminants in the Arctic and performed cleaning duties in communal areas.

At the ice stations (P6 and P7), I worked with the sea ice team to collect core samples for myself and other scientists (Table 18). I was also responsible for taking melt pond samples for all cruise participants at the two stations.

Ice samples were melted on board at room temperature and subject to an established chemical extraction procedure for analysis of trace level PFASs. The results will yield salinity and total PFAS (dissolved and particulate fraction) profiles in the ice.

Table 18. Samples collected for PFAS analysis

Sample type	Station	Sample processing	Planned analysis	Possible
Sea ice (4 cores)	P6, P7	Pooled 2 cores x 2	PFASs (dissolved + Particulate), Salinity, Stable isotopes for ice origin	PFASs (dissolved + Particulate),
Under-ice seawater (0.5 & 5m)	P6, P7			
melt ponds	P6, P7			
Snow	P6, P7			
Surface sediment	P7	unknown	PFASs	Preliminary screening

KPH improvement suggestions: In order to secure chemical containers with different sizes, several 4mm holes were needed to be drilled on each shelf in the chemical cabinet to fit bungee cords. However, the chemical store would benefit from having additional holes being drilled.

Cruise improvements suggestions: Future melt pond sampling teams would benefit from taking a hammer with them to break through the thick 6cm ice cap.
Waterproof notepads and pencils are recommended for work in the field.

Future work/collaborations: Future work should include more ice types located at different vicinities. In addition, measurements of PFASs in fresh snow and ice at various stages of ice growth and melt would provide valuable information on contaminant mobilization which could also to understand seasonal fluxes of contaminants into the different environmental compartments.

I have taken a small sample of surface sediment from 3000m at P7 to screen for PFASs. If successful, results will be presented to cruise leaders to discuss the possibility of future collaborations which will investigate the fate of PFAS in the Arctic Ocean. This would also be useful to combine results from fluxes of organic matter to deep ocean sediments (Yasmine) and PFAS transport via Atlantic water (Julia).

Logistics

Transport of equipment and samples

The logistic team of the Nansen Legacy project, Håvard Hansen and Simon Bjørvig, provided a guideline well ahead of the first cruise with information and deadlines for sending equipment to cruises, and for return of equipment, cooled samples (+4°C) and frozen samples (-20°C and -80°C). Pre-arranged transportation helps on both efficiency and costs prior to and after each cruise.

Equipment was shipped to Longyearbyen with Bring, and loading the ship in Longyearbyen went smooth and efficient resulting from well-planned work, and good collaboration between the logistics team, the crew and the scientists in Longyearbyen. The Nansen Legacy seasonal Q3 team leaders (Table A1.3) helped on deck to direct the pallets to the right deck, and cruise participants carried the boxes to the designated labs.

Shipping of samples that required cooled or frozen transport was ordered in advance, including dry ice for transport of frozen samples (-80°C). To be picked up at arrival in Longyearbyen.

A few pallets were left in Longyearbyen for the Nansen Legacy Q4-cruise, and is stored in the UNIS rubbhall, sjø.

On board communication

Based on the experience from last year cruises, a key task was to address challenges in keeping people updated on ongoing and planned activities, and to keep the station activity plan updated with respect to timing and progress. The vessel is large and the distance from the instrument room at Deck 7 to Deck 3 is long.

- Cruise leader and co-lead had 6 hrs shifts to always be present, and to meet often enough to discuss program and respond to any issues regarding practical or overarching character. They planned the overall timing of cruise activities, station work, posted programs and adjusted activities when needed, and had close communication with the bridge, instrument personnel, crew and scientists.
- Station programs were posted and available on all screens in due time, updated continuously, and facilitated good preparations from crew and scientists, and efficient sampling on each station.
- Two radios were provided from the vessel, set on Channel 4, to facilitate communication between cruise leader and the responsible scientists during sampling. One radio was placed on Deck 7 with the cruise leader on duty, and the other in the Dry lab, for common access. The use varied between the groups, but was important to inform on status and depth of zooplankton sampling with the different nets and during trawling (respond to adjustments needed based on catch).
- Daily meetings were held after dinner for short science presentations of ongoing work from scientists and cruise leaders, and to share practical information regarding science work, social life and routines onboard.

Station programs

A station program was prepared in Excel, published as a web page on the *khfelles-server* and updated continuously (Table 19). This program was available on HDMI13 on the TV screens in all common rooms, on the bridge, labs and cabins. Each screen had to be updated manually (remote control) during the August 2019 cruise. Adjustments to the program were done in Excel and published as a web page which was updated every 30 sec. To facilitate the links, automated updating and publishing, the instrument chief (Jan Bremnes) made a small script. Activities were marked green when finished, or red if cancelled or postponed to a later time slot in the program due to technical problems. The availability of plans ~24 hrs ahead and regular updates, resulted in efficient sampling and work during the cruise, as both crew and scientists could plan and prepare for sampling activities, handling of sampling and rest. Helping hands were also provided from those knowing they had some available time in the program. The ability to plan the work was well received on the bridge, among the crew and the scientists.

Table 19. Example from station program set up, posted prior to each transit and station work

Day	Date	Time	Station	Activity	#	Personnel	Comment	Duration (hrs)
Friday	23 Aug	10:00	SICE4	Sea ice work		Ice core team, under-ice water team, core-handle team, filtration team, polar bear guard and watch	Ice cores and under-ice water (sampling done prior to first box core in surface)	5:00
Friday	23 Aug	12:15	SICE4	Box core	3	Bodil, Arunima, Eric	3600 m	11:00

The overarching structure of the station programs was planned to get experiments and incubation work started, as they needed time to set up (sorting and preparations) and/ or deployment time (PP and sediment traps) during the station. Water column work was carried out first, and benthic sampling “contaminating” the water column, started only after all pelagic samples including vertical flux were done.

Water budgets

Water budgets were planned in advance to optimize the utilization of the bottles on the rosette. Parameters were distributed on the different CTD casts to optimize co-sampling for related parameters, and early sampling for water needed for experiments. On deep water stations (>3000 m), all deep-water requests were given priority on one CTD cast to avoid repeated CTD to the sea floor.

Excel sheets with water budgets for the NLEG and P-station CTD sampling programs are available.

Sample and data management for legacy

Routines for labelling and logging of samples and metadata for Nansen Legacy were developed prior to and established during the Nansen Legacy Joint Cruise 1-2 of 2018. The essential part of this system is that all samples and datasets are labelled with a UUID, and all information about each sample is logged in an excel sheet containing all relevant metadata and standardized parameters. The UUIDs are printed on stickers that can be attached to the samples. The stickers are available in different sizes. Two label printers were set up with a virtual server on the network onboard, so that they could be accessed from both stationary and personal computers. The excel sheet used for logging of sample information is generated using an excel template generator which was made available on the same virtual server along with an excel file checker, UUID generator and relevant documentation (the labelling manual, sampling protocol v4, and lists over the gear and sample types used in the project).

Universally unique IDs (UUIDs) for the individual gear used was assigned by one scientist. Metadata about the gear cast was copied from the cruise logger (Toktlogger v.1.1.2; download function did not work), UUIDs were generated and given, and additional relevant metadata was added (e.g., sample depths, data file names, serial number of instruments). This information was combined in an Excel file and shared in the cruise folder so that the scientists could grab the Parent IDs for their samples and also did not individually have to acquire metadata about the gear casts. Around 215 gear casts were registered (Appendix 1), and almost 13000 entries were uploaded to SIOS from the cruise. Sample and metadata information are accessible and searchable through the SIOS webpage. In addition to logging

information about collected samples, information about planned datasets based on data collected from the cruise was collected (Appendix 3). In general, the system for labelling and logging of samples worked well, although several scientists had problems accessing the ship network. This may be related to the fact that the ship computer system is divided into different networks, and that although we should have all relevant access through the network assigned to scientists, this is not always the case. Since our labelling system is placed on a virtual server on the ship network, it is essential that all scientists have easy access. The download function of the cruise logger (v1.2.2) does not work, so information has to be copied into our gear cast log sheet. Until relevant metadata are included in the cruise logger (including generation of UUIDs for each gear cast) and the download function works, it is necessary to assign one scientist to gather the relevant metadata for each gear cast, assign parent ID and to distribute this information to cruise participants during the cruise.

Communication and outreach

The locations and activities during research cruises are well suited to visualize the Arctic environment as well as the research activities in the project. Christian Morel (www.christianmorel.net) is a professional photographer with long time experience and competence on communicating Arctic landscapes, science activities and people of the north. He was hired by the Nansen Legacy project to take pictures and make movies that shows the scientific activities, the researchers, the Arctic landscape and the vessel. The products will be used for illustrations, science communications and in a future exhibition (Figure 17).

Pictures and movies of work (under-ice water, time laps videos etc.) is also provided by students, researchers, and crew for use in a project context.

Figure 17. Preparing for under-ice sampling. Photo: Christian Morel (christianmorel.net).

Blog texts from the cruise activities were produced during the cruise, and by the end of the cruise, 12 were published on Forskning.no (Appendix 2).

Appendix 1: Tables

Table A1.1 Full station list with locations and sampling gear (modified from cruise log)

ID	Gear Type	Date	Time (UTC)	Station Name	Lati-tude	Longi-tude	Bottom Depth (m)	Local St. ID	Sample Depth (m)	Max depth (m)	Min depth (m)
157	CTD w/bottles	2019-08-05	16:13	IsA	78.2609	15.5353	86.5	145	75		
158	CTD w/bottles	2019-08-06	07:34	W of Sørkapp	76.4165	13.9047	1050.28	146	500		
159	Glider 1	2019-08-06	09:53	W of Sørkapp	76.4165	13.9046	1050.28	42			
160	Glider 2	2019-08-07	13:40	P1 vicinity	76.0051	31.0345	327.52	43			
161	CTD w/bottles	2019-08-07	14:04	P1 vicinity	76.0068	31.0313	328.17	147	320		
162	CTD w/bottles	2019-08-07	16:58	P1	76.0000	31.2198	325.59	148			
163	WP3 1000 um	2019-08-07	17:48	P1	76.0000	31.2199	325.62	12		70	0
164	WP3 1000 um	2019-08-07	18:24	P1	76.0000	31.2198	325.69	13		315	0
165	WP3 1000 um	2019-08-07	19:17	P1	76.0000	31.2198	325.73	14		315	0
166	WP2 90 um	2019-08-07	19:32	P1	76.0000	31.2198	325.58	15		70	0
167	WP2 90 um	2019-08-07	19:51	P1	76.0000	31.2198	325.73	16		315	0
168	Bongonet 64 um	2019-08-07	20:31	P1	76.0000	31.2198	325.41	17		315	0
169	Bongonet 180 um	2019-08-07	21:06	P1	76.0000	31.2198	325.52	18		315	0
170	Sediment trap (short term)	2019-08-07	22:19	P1	76.0000	31.2198	324.99	44			
171	GO-FLO	2019-08-07	23:20	P1	76.0000	31.2194	325.31	45			
172	CTD w/bottles	2019-08-08	00:46	P1	76.0000	31.2194	325.44	149			
174	MIK-net 1500 um	2019-08-08	03:24	P1	76.0196	31.2897	330.8	20		320	0
175	MIK-net 1500 um	2019-08-08	04:09	P1	76.0057	31.2396	325.41	21		320	0
176	MIK-net 1500 um	2019-08-08	04:57	P1	75.9915	31.1894	323.19	22		320	0
177	Campelen trawl	2019-08-08	06:48	P1	76.0479	31.0987	333.37	101			
178	Phytoplankton net 10 um	2019-08-08	08:48	P1	76.0033	31.2137	326.21	23		50	0
179	Phytoplankton net 10 um	2019-08-08	09:01	P1	76.0033	31.2137	326.14	24		50	0
180	CTD w/bottles	2019-08-08	09:21	P1	76.0031	31.2141	325.86	150			
182	Multinet 64 um	2019-08-08	11:35	P1	76.0000	31.2201	325.53	25		290	0

183	Multinet 64 um	2019-08-08	12:17	P1	76.0000	31.2201	322.75	26		290	0
184	Multinet 180 um	2019-08-08	12:55	P1	76.0000	31.2200	325.37	27		290	0
185	Bongonet 64 um	2019-08-08	13:24	P1	76.0000	31.2200	321.15	28		300	0
186	Bongonet 64 um	2019-08-08	13:55	P1	76.0000	31.2200	324.16	29		300	0
187	Bongonet 180 um	2019-08-08	15:45	P1	76.0000	31.2201	322.25	30		300	0
188	Macroplankton trawl	2019-08-08	17:21	P1	76.0361	31.0716	332.48	102			
189	Harstad trawl	2019-08-08	19:34	P1	76.0355	31.0876	337.22	103			
190	CTD w/bottles	2019-08-08	20:50	P1	75.9986	31.2265	325.61	151			
191	GO-FLO	2019-08-08	22:14	P1	75.9986	31.2265	325.11	47			
192	Box core	2019-08-09	01:27	P1	75.9997	31.2153	326.11	9			
193	Box core	2019-08-09	03:46	P1	75.9998	31.2154	325.9	10			
194	Box core	2019-08-09	06:00	P1	75.9997	31.2154	324.81	11			
195	Harstad trawl	2019-08-09	09:46	P1 to NLEG2	76.2095	31.2316	315.83	104			
199	Mooring	2019-08-11	05:38	M5	77.0803	35.0381	145.56	48			
200	Mooring	2019-08-11	05:46	M5 bioac	77.0825	35.0578	147.18	49			
201	CTD	2019-08-11	08:21	M5 to P2	77.3252	34.4502	158.54	154			
202	CTD w/bottles	2019-08-11	10:56	P2	77.4986	34.0011	188.66	155			
203	CTD w/bottles	2019-08-11	11:59	P2	77.4987	34.0012	188.87	156	178		
204	Phytoplankton net 10 um	2019-08-11	12:43	P2	77.4986	34.0012	188.84	31		100	0
205	Phytoplankton net 10 um	2019-08-11	13:02	P2	77.4985	34.0005	187.97	32		100	0
207	WP3 1000 um	2019-08-11	14:09	P2	77.4986	34.0008	188.57	34		150	0
208	WP3 1000 um	2019-08-11	14:42	P2	77.4986	34.0007	188.34	35		150	0
	WP3 1000 um	2019-08-11	15:00	P2	77.4986	34.0007	188.34			150	0
209	Campelen trawl	2019-08-11	15:18	P2	77.5156	33.9343	186.95	105			
210	MIK-net 1500 um	2019-08-11	16:42	P2	77.5010	33.9502	186.73	36		160	0
211	MIK-net 1500 um	2019-08-11	17:30	P2	77.4990	33.9955	188.18	37		160	0
212	MIK-net 1500 um	2019-08-11	18:03	P2	77.5085	33.9661	190.79	38		170	0
213	GO-FLO	2019-08-11	19:10	P2	77.5006	33.9865	186.15	50			
214	Active water sampler	2019-08-11	20:47	P2	77.5006	33.9864	186.08	51			
215	TS probe	2019-08-12	01:14	P2	77.5006	33.9864	186.33	1			
216	CTD w/bottles	2019-08-12	02:11	P2	77.5006	33.9865	186.3	157	175		

217	Multinet 180 um	2019-08-12	03:19	P2	77.5006	33.9865	186.36	39		170	0
218	Multinet 64 um	2019-08-12	03:53	P2	77.5006	33.9864	186.38	40		170	0
219	Multinet 64 um	2019-08-12	04:43	P2	77.5006	33.9865	186.47	41		150	0
221	Macroplankton trawl	2019-08-12	06:56	P2	77.5163	34.0057	193.53	106			
224	Box core	2019-08-12	08:38	P2	77.4994	34.0008	188.46	12			
225	Box core	2019-08-12	11:01	P2	77.4994	34.0008	188.6	13			
226	Box core	2019-08-12	12:57	P2	77.4995	34.0007	188.78	14			
227	Bongonet 180 um	2019-08-12	13:28	P2	77.4995	34.0007	188.87	45		170	0
228	Bongonet 64 um	2019-08-12	13:56	P2	77.4995	34.0007	188.95	46		170	0
229	Bongonet 64 um	2019-08-12	14:19	P2	77.4995	34.0007	188.88	47			
230	CTD w/bottles	2019-08-12	18:11	NLEG05	77.9989	33.9998	196.18	158	181		
231	Mooring	2019-08-12	21:22	M5	78.3478	34.7624	241.23	52			
232	CTD	2019-08-12	21:30	M5	78.3498	34.7751	246.96	159			
233	CTD w/bottles	2019-08-12	23:41	NLEG06	78.5000	34.0004	179.89	160	170		
234	Campelen trawl	2019-08-13	02:11	P3	78.7318	34.0098	307.25	107			
235	CTD w/bottles	2019-08-13	03:27	P3	78.7498	34.0008	306.99	161	300		
236	GO-FLO	2019-08-13	04:12	P3	78.7498	34.0006	306.98	53			
237	MIK-net 1500 um	2019-08-13	05:10	P3	78.7502	34.0004	307.11	48			
239	Multinet 180 um	2019-08-13	06:20	P3	78.7500	34.0000	306.8	50		280	0
240	Multinet 64 um	2019-08-13	06:58	P3	78.7500	34.0000	306.77	51		280	0
241	Phyto-plankton net 10 um	2019-08-13	07:29	P3	78.7500	34.0000	306.71	52		100	0
242	CTD w/bottles	2019-08-13	09:40	NLEG08	79.0003	33.9997	269.57	162	260		
243	CTD w/bottles	2019-08-13	12:12	NLEG09	79.2492	34.0018	215.73	163	205		
244	CTD w/bottles	2019-08-13	14:26	NLEG10	79.5002	33.9966	300.18	164	290		
245	CTD w/bottles	2019-08-13	17:46	P4	79.7494	33.9971	338.39	165	325		
246	Bongonet 180 um	2019-08-13	18:31	P4	79.7475	33.9880	338.83	53		100	0
247	WP2 90 um	2019-08-13	18:49	P4	79.7476	33.9853	338.43	54		70	0
248	WP2 90 um	2019-08-13	19:01	P4	79.7477	33.9827	338.11	55		70	0
249	Bongonet 180 um	2019-08-13	19:12	P4	79.7478	33.9801	337.72	56		300	0
250	Bongonet 180 um	2019-08-13	19:33	P4	79.7485	33.9737	337.7	57		300	0
251	WP3 1000 um	2019-08-13	20:14	P4	79.7517	33.9588	336.24	58		300	0

252	Sediment trap (short term)	2019-08-13	21:40	P4	79.7578	33.9657	329.89	54			
253	Phytoplankton net 10 um	2019-08-13	21:51	P4	79.7584	33.9733	330.05	59		100	0
254	Active water sampler	2019-08-13	23:35	P4	79.7584	34.0766	326.97	55			
255	GO-FLO	2019-08-14	02:19	P4	79.7343	34.2372	344.53	56			
257	MIK-net 1500 um	2019-08-14	04:26	P4	79.7077	34.2833	351.99	60			
258	MIK-net 1500 um	2019-08-14	05:03	P4	79.7026	34.2815	354.2	61		320	0
259	MIK-net 1500 um	2019-08-14	05:51	P4	79.6941	34.2683	356.7	62		320	0
260	MIK-net 1500 um	2019-08-14	06:43	P4	79.6931	34.2520	355.31	63		320	0
261	CTD w/bottles	2019-08-14	07:24	P4	79.6932	34.2300	352.99	166	340		
262	Multinet 180 um	2019-08-14	08:33	P4	79.6964	34.2245	345.53	64		325	0
263	Multinet 64 um	2019-08-14	09:13	P4	79.7002	34.2237	341.7	65		280	0
264	Multinet 64 um	2019-08-14	10:10	P4	79.7073	34.2281	342.63	66		325	
266	CTD w/bottles	2019-08-14	11:06	P4	79.7140	34.2664	341.28	167	330		
267	Bongonet 180 um	2019-08-14	11:43	P4	79.7179	34.2909	343.08	67		330	0
268	Bongonet 64 um	2019-08-14	12:12	P4	79.7203	34.3065	343.78	68		330	0
269	Bongonet 64 um	2019-08-14	12:41	P4	79.7211	34.3182	341.63	69		330	0
270	CTD w/bottles	2019-08-14	13:15	P4	79.7226	34.3311	338.9	168	329		
271	CTD	2019-08-14	13:52	P4	79.7233	34.3442	337.3	169		50	0
272	GO-FLO	2019-08-14	14:11	P4	79.7230	34.3530	336.49	58			
273	TS probe	2019-08-14	16:13	P4	79.7111	34.3772	338.16	3			
274	Campelen trawl	2019-08-14	19:50	P4	79.5518	34.5686	328.4	108			
275	Macroplankton trawl	2019-08-14	20:56	P4	79.4983	34.6344	304.77	109			
276	Box core	2019-08-15	01:37	P4	79.7457	34.0169	333.83	15			
277	Box core	2019-08-15	03:10	P4	79.7434	33.9961	332.7	16			
278	Box core	2019-08-15	04:51	P4	79.7518	34.0282	331.05	17			
279	CTD w/bottles	2019-08-15	08:22	NLEG12	79.9982	33.9961	211.8	170	204		
280	CTD w/bottles	2019-08-15	17:03	P5	80.4966	33.9898	162.71	171	150		
281	CTD	2019-08-15	17:44	P5	80.4951	33.9678	159.36	172			
282	Bongonet 180 um	2019-08-15	17:55	P5	80.4949	33.9620	159.3	70		140	0
283	Bongonet 180 um	2019-08-15	18:16	P5	80.4951	33.9502	154.82	71		140	0

284	Phytoplankton net 10 um	2019-08-15	18:31	P5	80.4954	33.9424	159.12	72		140	0
285	Phytoplankton net 10 um	2019-08-15	18:47	P5	80.4957	33.9353	160.85	73		100	0
286	Sediment trap (short term)	2019-08-15	20:32	P5	80.5006	33.8810	157.14	59		100	0
287	MIK-net 1500 um	2019-08-15	21:05	P5	80.5092	33.8602	162.19	74			
288	MIK-net 1500 um	2019-08-15	21:16	P5	80.5117	33.8545	168.54	75		140	0
289	MIK-net 1500 um	2019-08-15	21:35	P5	80.5163	33.8551	169.2	76		140	0
290	GO-FLO	2019-08-15	22:41	P5	80.5245	33.8928	171.81	60		140	0
291	CTD w/bottles	2019-08-16	00:23	P5	80.5289	33.9602	169.77	173			
292	TS probe	2019-08-16	00:55	P5	80.5273	33.9844	174.35	4			
293	Multinet 180 um	2019-08-16	04:12	P5	80.4952	34.0860	162.0	77		140	0
294	Multinet 64 um	2019-08-16	04:49	P5	80.4884	34.0835	159.99	78		140	0
295	Multinet 64 um	2019-08-16	06:16	P5	80.4771	34.0669	157.25	79		150	0
296	Bongonet 180 um	2019-08-16	06:39	P5	80.4749	34.0641	155.24	80			
297	Bongonet 64 um	2019-08-16	07:09	P5	80.4737	34.0620	154.77	81			
298	Bongonet 64 um	2019-08-16	07:30	P5	80.4736	34.0579	152.96	82			
299	CTD w/bottles	2019-08-16	09:03	P5	80.4772	34.0514	154.64	174	152		
300	Sampling from small boat	2019-08-16	10:08	P5	80.4843	34.0677	159.33	61			
	Li-Cor	2019-08-16	10:15	P5	80.4846	34.0575	162.0			20	0
	CTD	2019-08-16	10:30	P5	80.4846	34.0575	162.0				
303	Box core	2019-08-16	11:57	P5	80.5021	34.0173	160.68	19			
306	CTD w/bottles	2019-08-16	23:06	NLEG 14	81.0018	33.9996	219.56	175	219		
307	CTD w/bottles	2019-08-17	05:56	NLEG 15	81.3118	31.3503	188.46	176	175		
308	CTD	2019-08-17	07:29	NLEG 16	81.3822	31.2898	186.42	177			
309	CTD	2019-08-17	08:15	NLEG 17	81.4110	31.2455	205.56	178			
310	CTD	2019-08-17	09:13	NLEG 18	81.4310	31.1448	256.17	179			
311	CTD w/bottles	2019-08-17	10:04	NLEG 19	81.4593	31.0778	496.41	180	500		
313	CTD	2019-08-17	11:52	NLEG 20	81.5025	30.9588	693.98	181			
	Sea ice work	2019-08-17	16:30	P6_Ice	81.5327	30.9684	797.07				
314	Active water sampler	2019-08-17	18:17	P6	81.5297	30.9555	789.23	64			

315	TS probe	2019-08-17	23:02	P6	81.5498	30.9588	865.44	5			
316	CTD w/bottles	2019-08-18	06:33	P6	81.5495	31.1605	834.68	182	831		
317	MIK-net 1500 um	2019-08-18	07:52	P6	81.5514	31.1684	839.88	83		50	0
318	MIK-net 1500 um	2019-08-18	08:07	P6	81.5521	31.1700	841.87	84		50	0
319	MIK-net 1500 um	2019-08-18	08:20	P6	81.5528	31.1709	844.43	85		50	0
320	MIK-net 1500 um	2019-08-18	08:34	P6	81.5537	31.1716	848.7	86		50	0
321	MIK-net 1500 um	2019-08-18	08:48	P6	81.5548	31.1714	853.44	87		50	0
322	Multinet 180 um	2019-08-18	09:04	P6	81.5562	31.1697	860.71	88		600	0
323	Sediment trap (short term)	2019-08-18	11:30	P6	81.5705	31.2185	860.71	65			
324	CTD w/bottles	2019-08-18	11:49	P6	81.5720	31.2128	1155.75	183	200		
325	GO-FLO	2019-08-18	12:30	P6	81.5748	31.2451	1224.91	66			
326	Phytoplankton net 10 um	2019-08-18	13:53	P6	81.5762	31.3259	1026.46	89			
327	MIK-net 1500 um	2019-08-18	14:47	P6	81.5765	31.3874	1036.91	90		1000	0
328	MIK-net 1500 um	2019-08-18	17:47	P6	81.5638	31.5185	856.29	91		400	0
329	Multinet 180 um	2019-08-18	18:33	P6	81.5612	31.5260	843.73	92		750	0
330	Multinet 64 um	2019-08-18	19:32	P6	81.5595	31.5188	841.06	93		300	0
331	Multinet 64 um	2019-08-18	20:26	P6	81.5604	31.4993	848.67	94		750	0
332	Bongonet 180 um	2019-08-18	21:48	P6	81.5665	31.4724	894.92	95		750	0
333	Bongonet 64 um	2019-08-18	22:51	P6	81.5733	31.4686	989.02	96		750	0
334	Bongonet 64 um	2019-08-19	00:08	P6	81.5808	31.4872	1111.65	97		650	0
335	CTD w/bottles	2019-08-19	01:07	P6	81.5850	31.5195	1099.78	184	200		
336	Bongonet 180 um	2019-08-19	02:27	P6	81.5865	31.5707	1099.2	98			
337	Bongonet 180 um	2019-08-19	02:47	P6	81.5862	31.5827	1089.07	99			
338	TS probe	2019-08-19	03:56	P6	81.5842	31.6212	979.27	6			
339	Box core	2019-08-19	09:01	P6	81.5452	30.8475	856.66	22			
341	Box core	2019-08-19	11:22	P6	81.5632	30.8870	1036.76	23			
342	Box core	2019-08-19	13:01	P6	81.5400	30.8759	829.08	24			
343	Box core	2019-08-19	15:02	P6	81.5346	30.9570	806.3	25			
344	CTD w/bottles	2019-08-19	16:53	NLEG 22	81.5905	30.7409	1545.57	185			
345	CTD w/bottles	2019-08-19	18:57	NLEG 23	81.6165	30.6529	1950.0	186	1950		
346	CTD w/bottles	2019-08-19	22:24	NLEG 24	81.6830	30.5225	2812.6	187			

347	Bongonet 180 um	2019-08-20	08:03	P7	81.9848	29.9870	3272.97	100			
348	Bongonet 180 um	2019-08-20	08:41	P7	81.9836	29.9695	3269.47	101			
349	Active water sampler	2019-08-20	09:25	P7	81.9827	29.9437	3274.07	68			
	Sea ice work	2019-08-20	07:30	P7_Ice	81.9861	29.9975	3272.82				
351	MIK-net 1500 um	2019-08-20	12:54	P7	81.9819	29.7942	3290.87	102		1250	0
352	MIK-net 1500 um	2019-08-20	14:58	P7	81.9811	29.7287	3290.87	103		2000	0
353	CTD w/bottles	2019-08-20	18:08	P7	81.9693	29.6217	3293.25	188	3280		
354	WP2 90 um	2019-08-20	23:16	P7	81.9509	29.3074	3306.9	104		70	0
355	WP2 90 um	2019-08-20	23:39	P7	81.9500	29.2858	3313.34	105		70	0
356	Bongonet 180 um	2019-08-20	23:54	P7	81.9494	29.2729	3315.21	106		100	0
357	MIK-net 1500 um	2019-08-21	00:15	P7	81.9483	29.2548	3317.39	107		100	0
359	Sediment trap (short term)	2019-08-21	03:03	P7	81.9322	29.1573	3312.04	70	3312		
360	MIK-net 1500 um	2019-08-21	03:30	P7	81.9283	29.1460	3301.77	109		100	0
361	CTD w/bottles	2019-08-21	03:43	P7	81.9262	29.1396	3299.7	189	3300		
362	Phytoplankton net 10 um	2019-08-21	04:28	P7	81.9184	29.1151	3289.48	110			
363	Multinet 180 um	2019-08-21	04:56	P7	81.9133	29.0975	3288.53	111		1000	0
364	Multinet 180 um	2019-08-21	06:34	P7	81.8948	29.0291	3254.08	112		1000	0
365	Multinet 64 um	2019-08-21	07:49	P7	81.8826	28.9682	3233.46	113		1000	0
366	Multinet 64 um	2019-08-21	09:52	P7	81.8654	28.8577	3136.7	114		300	0
368	CTD w/bottles	2019-08-21	11:11	P7	81.8576	28.8065	3120.7	190	3120		
369	Bongonet 180 um	2019-08-21	11:51	P7	81.8542	28.7927	3116.7	115			
370	Bongonet 64 um	2019-08-21	13:06	P7	81.8462	28.7856	3068.87	116			
371	Bongonet 64 um	2019-08-21	14:40	P7	81.8291	28.8017	2993.82	117			
372	CTD w/bottles	2019-08-21	17:33	P7	81.7882	28.7840	2897.95	191	2830		
373	TS probe	2019-08-21	19:55	P7	81.7591	28.7037	2767.68	7			
	Sediment trap (short term)	2019-08-22	00:40	P7	81.7375	28.6488	2712.97	70	2713		
374	GO-FLO	2019-08-22	00:48	P7	81.7371	28.6367	2725.78	72			
375	Box core	2019-08-22	02:12	P7	81.7276	28.6712	2648.91	26			
376	Box core	2019-08-22	08:34	P7	81.6707	28.7890	2349.31	27			
378	Box core	2019-08-22	12:49	P7	81.6683	28.8118	2329.02	28			

379	TS probe	2019-08-23	01:07	SICE4	81.9809	24.2938	3603.33	8			
380	Sea ice work	2019-08-23	08:10	SICE4	81.9784	24.4732	3599.76	74			
381	Box core	2019-08-23	10:18	SICE4	81.9851	24.5301	3603.75	29			
384	Box core	2019-08-23	16:55	SICE4	81.9888	24.7358	3603.75	31			
385	Box core	2019-08-23	20:12	SICE4	81.9858	24.8045	3604.08	32			
386	CTD w/bottles	2019-08-24	03:02	SICE4	81.9957	24.9952	3657.19	192	3195		
387	EM302	2019-08-25	11:30	NW Spitsbergen	80.3806	12.1674	NaN	76			
388	CTD w/bottles	2019-08-25	13:52	NW Spitsbergen	80.5890	12.0545	19.57	193			
389	EM302	2019-08-25	14:45	NW Spitsbergen	80.5944	12.0526	NaN	77			

Table A1.2. Nansen Legacy transect. Full station list including Process stations (P) and transect CTD stations (NLEG).

Nansen Legacy transect stations							
Station name	**Longitude (decimal)**	**Latitude (decimal)**	**Longitude (degrees)**	**Latitude (degrees)**	**Depth (m)**	**Type of station**	**Comment**
P7/ NLEG25	**30,0000**	**82,0000**	**030 00.00 E**	**82 00.00 N**	**3000**	**Process study station P7**	
NLEG24	30,5258	81,6828	030 31.55 E	81 40.97 N	2807		*A-TWAIN*
NLEG23	30,6647	81,6165	030 39.88 E	81 36.99 N	1913		*A-TWAIN*
NLEG22	30,7667	81,5895	030 46.00 E	81 35.37 N	1551		*A-TWAIN*
P6/ NLEG21	**30,8548**	**81,5463**	**030 51.29 E**	**81 32.78 N**	**865**	**Process study station P6**	***A-TWAIN, shelf-break***
NLEG20	30,9618	81,5025	030 57.71 E	81 30.15 N	698		*A-TWAIN, shelf-break*
NLEG19	31,0775	81,4580	031 04.65 E	81 27.48 N	486		*A-TWAIN, shelf-break*
NLEG18	31,1448	81,4318	031 08.69 E	81 25.91 N	264		*A-TWAIN, shelf-break*
NLEG17	31,2468	81,4107	031 14.81 E	81 24.64 N	204		*A-TWAIN, shelf-break*
NLEG16	31,2933	81,3822	031 17.60 E	81 22.93 N	189		*A-TWAIN, shelf-break*
NLEG15	31,3487	81,3098	031 20.92 E	81 18.59 N	195		*Arctic Price near-shelf-station*
NLEG14	34,0000	81,0000	034 00.00 E	81 00.00 N	216		*Vardø-N, Kvitøybanken*
P5/ NLEG13	**34,0000**	**80,5000**	**034 00.00 E**	**80 30.00 N**	**167**	**Process study station P5**	***Vardø-N, Kvitøybanken***
NLEG12	34,0000	80,0000	034 00.00 E	80 00.00 N	209		*Vardø-N, Kvitøybanken*
P4/ NLEG11	**34,0000**	**79,7500**	**034 00.00 E**	**79 45.00 N**	**332**	**Process study station P4**	***Vardø-N, trench east of Kong Karl***
NLEG10	34,0000	79,5000	034 00.00 E	79 30.00 N	293		*Vardø-N, trench east of Kong Karl*
NLEG09	34,0000	79,2500	034 00.00 E	79 15.00 N	215		*Vardø-N, trench east of Kong Karl*
NLEG08	34,0000	79,0000	034 00.00 E	79 00.00 N	266		*Vardø-N, trench east of Kong Karl*
P3/ NLEG07	**34,0000**	**78,7500**	**034 00.00 E**	**78 45.00 N**	**301**	**Process study station P3**	***Vardø-N, trench east of Kong Karl***
NLEG06	34,0000	78,5000	034 00.00 E	78 30.00 N	180		*Vardø-N, Storbanken*
NLEG05	34,0000	78,0000	034 00.00 E	78 00.00 N	193		*Vardø-N, Storbanken*
P2/ NLEG04	**34,0000**	**77,5000**	**034 00.00 E**	**77 30.00 N**	**190**	**Process study station P2**	***Vardø-N, Storbanken***
NLEG03	34,0000	77,0000	034 00.00 E	77 00.00 N	154		*Vardø-N, Storbanken*
NLEG02	31,2200	76,5000	031 13.20 E	76 30.00 N	308		*Vardø-N, Storbanken*
P1/ NLEG01	**31,2200**	**76,0000**	**031 13.20 E**	**76 00.00 N**	**322**	**Process study station P1**	***Vardø-N, Hopendjupet***

Table A1.3. Cruise participants (team leaders in bold)

	Name, institution	Inst.	Nansen Legacy tasks	Sea ice work	Weapon training	Work package
1	Marit Reigstad	UiT	Cruise leader, sediment traps			RF3
2	Tove Gabrielsen	UNIS	Cruise leader, sample labeling		x	RF3
3	Miriam Marquardt	UiT	Water budget, sea ice work planning, filtration (Chl a, POC), sed traps, sea ice meiofauna	x	x	RF3
4	Marti Amargant, PhD	UiT	Prim prod, 14C incubations. In-situ, P vs I and P vs T curves, phytoplankton	x	(x)	RF3
5	Oliver Müller, PD	UiB	Microbiology/ BP, flow cytometry, grazing exclusion exp	x	x	RF3
6	Lasse Olsen, PD	UiB	Abundance of phytoplankton, heterotrophic flagellates, bacteria and virus, bacterial production	x	x	RF3
7	Bente Edvardsen	UiO	DNA/RNA filtrations, sampling for microscopy etc	x		RF3
8	Karoline Saubrekka, PhD	UiO	DNA/RNA filtrations, sampling for microscopy etc			RF3
9	Anna Vader	UNIS	Metabarcoding, metatranscriptomics, filtration chl a, Planning sea ice work	x	x	RF3
10	Griselda Anglada Ortiz, PhD	UiT	Ocean acidification, zooplankton (foraminifera, pteropods), sediment surface			RF1/RF2
11	Anette Wold	NPI	Mesozooplankton sampling, biomass, POM for CSIA of FA	x	x	RF3
12	Christine Gawinski, PhD	UiT	Zooplankton sampling, small zooplankton secondary production (grazing, egg production)			RF3
13	Konrad Karlsson, PD	UNIS	Mesozooplankton, grazing experiments, respiration measurements			RF3
14	Padmini Dalpadado	IMR	Macrozooplankton			RF3
15	Angela Stippkugel, PhD	NTNU	Mesozooplankton grazing experiments (dilution experiments).	x		RF3
16	Kasia Dmoc	NPI/IOPAS Poland	Mesozooplankton zooplankton			RF3
17	Robynne Nowicki, PhD	UNIS	Ecotox, Zooplankton and fish		x	RF2
18	Yasemin Bodur, PhD	UiT	Sediment traps, filtration, sediment surface sampling	(x)		RF3
19	Bodil Bluhm	UiT	Benthic sampling. Stable isotope sampling (for PD UiT/HI), NL museum voucher collection, benthic meiofauna (UiT/UNIS PhD), invertebr. for OC content (Ecopath need), ice meiofauna processing (with Miriam)		(x)	RF3
20	Eric Jorda, PhD	Nord	Living benthic forams and benthic meiofauna, experiments with Arunima			RF2/RF3
21	Arunima Sen, PD	Nord	benthic respiration, experiments with Eric			RF3
22	Fekadu Yadetie, PD	UiB	Fish sampling from trawling, liver slice culture and tissue sampling, helping out inzoo/fish/benthic labs			RF2

23	Nadja Brun, PD	Woods Hole, USA	Fish sampling from trawling, liver slice culture and tissue sampling, helping out in zoo/fish/benthic labs			RF2
24	Siv Hoff, PhD	UiO	Ecotox sampling (zooplankton /fish) and helping out in zoo/fish/benthic labs			RF2
25	Leif Christian Stige	UiO	Ecotox sampling (zooplankton /fish) and helping out in zoo/fish/benthic labs			RF2
26	Ane Haarr, PhD	UiO	Ecotox sampling (zooplankton /fish) and helping out in zoo/fish/benthic labs			RF2
27	Julia Giebichenstein, PhD	UiO	in situ sampling of water filtering, ecotox zooplankton and fish	x		RF2
28	Rita Amundsen	UiO	Ecotox zooplankton and fish			RF2
29	Håvard N. Liholt	UiO	Ecotox sampling (zooplankton /fish) and helping out in zoo/fish/benthic labs		x	RF2
30	Jack Garnett, PhD	Lancaster, UK	PFOS in ice cores	x		EISPAC, CAO project
31	Nicolas Sanchez, PD	NTNU	Trace metals and perhaps DOC characterization	x		RF2
32	Stephen Kohler, PhD	NTNU	Trace metals and perhaps DOC characterization	x		RF2
33	Ronald Pedersen	IMR	Acoustics, TS-probe, moorings			RF3
34	Jon Leithe	NPI	Safety, sea ice work training, Sea ice observations, polar bear watch on ice, glider	x	x	RA-A
35	Christian Morel	France	Photographer (photo, video, drone)	x		RA-D
	Jan Vidar Nordstrand	IMR	Instrument chief KPH			
	Jan Bremnes	IMR	Instrument technician KPH			

Table A1.4. Internship on sea ice.

List of non- or less experienced PhDs and post docs that took part in sea ice-based sampling, handling, data collection and safety duties and achieved competence on methodologies and practical work.

Name	**Sea ice work practice**
Ane Haarr (UiO)	Core handling, filtered sea water addition on board, polar bear watch
Angela Stippkugel (NTNU)	Drilling hole for under ice sampling, under ice water sampling, polar bear watch
Christine Gawinski (UiT)	Ice core note keeper, polar bear watch
Eric Jorda (Nord)	Drilling hole for under ice sampling, under ice water sampling, polar bear watch
Håvard N. Liholt (UiO)	Polar bear guard, drilling hole for under ice sampling, polar bear watch
Jack Garnett (Lancaster Univ.)	Sea ice coring, Melt pond and under ice water sampling, polar bear watch
Julia Giebichenstein (UiO)	Ice core note keeper, sea ice coring, core cutting, polar bear watch
Karoline Saubrekka (UiO)	Sea ice coring, core handling, polar bear watch, logistics team onboard, filtration team
Konrad Karlsson (UNIS)	Sea ice coring, polar bear watch
Márti Amargant (UiT)	Sea ice coring, Melt pond and under ice water sampling, polar bear watch
Oliver Müller (UiB)	Sea ice coring, core cutting, polar bear watch
Robynne Nowicki (UNIS)	Polar bear guard, drilling hole for under ice sampling, under ice CTD and light, polar bear watch
Siv Hoff (UiO)	Core handling, filtered sea water addition on board, logistics team onboard, polar bear watch
Stephen Kohler (NTNU)	Sea ice coring, Melt pond and under ice water sampling
Yasemin Bodur (UiT)	Ice core note keeper, sea ice coring

Table A1.5. Working hours and cabin distributions

Working hours 0400-1200, 1600-2000	**Working hours 2000-0400, 1200-1600**	Cabin
Marit Reigstad		605
Lasse Olsen	Oliver Müller	419
Leif Chr. Stige	Jon Leithe	421
	Tove Gabrielsen	468
Ronald Pedersen	Jack Garnett	456
Padmini Dalpadado		458
Christian Morel	Márti Amargant	327
Robynne Nowicki	Kasia Dmoc	329
Anna Vader	Miriam Marquardt	330
Eric Jorda	Konrad Karlsson	332
Christine Gawinski	Angela Stippkugel	333
Karoline Saubrekka	Griselda Anglada Ortiz	335
Fekadu Yadetie	Håvard N. Liholt	377
Anette Wold	Bodil Bluhm	379
Siv Hoff	Julia Giebichenstein	380
Nicholas Sanchez	Stephen Kohler	382
Bente Edvardsen	Rita Amundsen	383
Yasemin Bodur	Arunima Sen	385
Nadia Brun	Ane Haarr	386

Table A1.6. Lab-use during the Nansen Legacy Q3 cruise

Lab no.	Name of laboratory	General description	Use on this cruise
102	Clean seawater sample room	Underway survey measurements	Instrument crew
202	Gravity meter room		Not in use
301	Chilled lab	Mesozooplankton, microbial exp. preparation lab	Angela, Christine, Oliver, Konrad
302	Dry lab common	Sea water filtration, POC, Chl a, virus, bacteria, fluorometer	Miriam, Yasemin, Oliver, Lasse
303	Wet lab common	Meso and macrozooplankton	Anette, Padmini, Kasia D, Rita, Robynne, Griselda
307	Isotopic lab	Production biology	Marti (PP), Lasse, Oliver (BP)
308/309	Wet lab biology	Fish ecotox sampling	Fekadu, Nadja
310	Catch sample room	Fish and benthos sampling/ sea ice equipment	Leif Chr., Siv, Ane, Håvard, Robynne
311	Environmental toxicology lab	Trace metal clean lab	Nicolas, Stephen
316	Filtration lab	DNA, RNA filtration	Anna, Bente, Karoline
317	Education lab	Common use computer work, Microscopes, microtome, sample labeling	Bente, Karoline, Miriam, Anna, all
319	Wet Lab Geology /Benthos	Benthos	Bodil, Arunima, Eric, Jack, Yasemin,
320	Microbiology lab	Ecotox filtration	Julia, Rita
322	Ice Lab	Common use (°C)	Ice core handling
312	Cooler room	Plankton experiments, Plankton wheels (°C)	Angela, Konrad
313	Freezer room	Frozen samples storage	Frozen biological material
314	Cooler room	Benthos exp (Temp+)(°C)	Bodil, Arunima, Eric
315	Cooler room	Benthos exp. (Temp. in situ), storage samples (<4°C)	Bodil, Arunima, Eric, Yasemin, Fekadu, Nadja
323	Cooler room	P-I experiments, ice core melting (°C)	Marti, Oliver, ice work
325	Freezer Ice Samples	For ice samples	Frozen material (non-bio)
701	Observation Central	Common	Instrument engineers, CTD operator, chief scientists
703	Large conference room	Common	Everyone for computer work
	Small conference room	Common	Everyone for computer work
KPH Thermax Fridge 1	303 Wet lab	Zooplankton, temporary storage of fresh samples	Christine

KPH Thermax Fridge 2	303 Wet lab	Zooplankton, temporary storage of fresh samples	Christine
UiT Thermax Fridge 3	CTD Hangar	Microbial experiments	Lasse and Oli
UiT Thermax Fridge 4	CTD Hangar	Zooplankton production exp.	Christine
UiT Thermax Fridge 5	CTD Hangar	Zooplankton production exp.	Christine

Appendix 2: Blogs

Blogs written by cruise participants in collaboration with the project office and published on the Nansen Legacy Blog at Forskning.no during the Nansen Legacy seasonal Q3 cruise 2019.

Published on Forskning.no/blogg-Arven etter Nansen, August 2019

No	Title	Author(s)	Status
1	*Året rundt i Barentshavet* – on the background for the cruise and seasonal studies	Marit Reigstad & Lena Seuthe	✓Publ. 5/8
2	*En båt lastet med morgendagens forskere* – why we train a new generation Arctic scientists	Lena Seuthe	✓Publ. 13/8
3	*Ingen mann over bord* – on safety issues in the Arctic	Jon Leithe	✓Publ. 14/8
4	*Når alle er i samme båt* – on how a vessel promotes science collaboration	Marit Reigstad	✓Publ. 30/8.
5	*Men jeg venter på is*	Jon Leithe	✓ Publ. 19/8
6	*Lærlinger på isflak (Internship på havisen)*	Marit Reigstad	✓ Publ. 20/8
7	*Risikerer vi å kvele havets bunndyr? (A breath of air…..20,000 leagues under the sea*)	Arunima Sen	✓ Publ. 21/8
8	*Så hvitt og pent, men ikke rent (Why it's important to study contaminants in the Arctic)*	Jack Garnett	✓ Publ. 15/8
9	*Å jobbe med det usynlige – eller hvorfor fotografen ikke tar bildet av arbeidet vårt*	Oliver Müller and Lasse Olsen	✓ Publ. 23/8
10	*Stressmestring – Om kofferter og miljøgifter på avveie.* Dealing with stress - On lost luggage and found contaminants	Nadja Brun	✓Publ. 28/8
11	*På isen i Nansenbassenget*	Tove M. Gabrielsen	✓Publ. 27/8
12	*Isarbeid på trygg grunn*	Jon Leithe	✓Publ. 29/8

Appendix 3 Datasets

Shipmounted datasets

Who		Sample info		Analyses					Relevance to Nansen Legacy		Data				
Cruise participant	PI	Sample type	Intended method	Parameter	Analysis protocol	Dataset	Where will analyses be done	When are analyses planned for	RF	Task/Subtask	Sharing within project	Publishing data	Ask for embargo of data?	If yes, why?	Comments
KHP instrumentation	Randi Ingvaldsen					Acoustic data surveying fish and xooplankton, logged continuously					2019, NIRD	2020			EK80
KHP instrumentation	Tom Arne Rydningen					Multibeam mapping					post cruise on NIRD	2020	no		EM302
KHP instrumentation	Øystein Godøy					Air and sea temperature (8 m depth), air pressure, wind speed and direction,					post cruise on NIRD	2020			Weather station
KHP instrumentation	Helge Sagen					Temperature, salinity, density and fluorescence at 4m, logged continuously					post cruise on NIRD	2020			Thermosalinograph
KHP instrumentation	Randi Ingvaldsen					Currents in the upper ~500 m legged continuously					post cruise on NIRD	2020			ADCP 150 kHz
KHP instrumentation	Agneta Fransson					pCO2 measured from the underway system, 4 m intake during the open wate					post cruise on NIRD	2020			pCO2 underway
KHP instrumentation	Marit Reigstad					Temperature, salinity, density fluorescence, oxygen profiles from NLEG stati					post cruise on NIRD	2020	no		CTD

Datasets

Who		Sample info		Analyses					Relevance to Nansen Legacy implementation plan		Data				
Cruise participant	PI	Sample type	Intended method	Parameter	Analysis protocol	Dataset	Where will analyses be done	When are analyses planned for	RF	Task/Subtask	Sharing within project	Publishing data	Ask for embargo of data?	If yes, why?	Comments
Anna Vader	Anna Vader	Chlorophyll a		Chl a total and >10um biomass	NL v4 7.11.1	Chl a total and >10um biomass	Onboard KPH	During cruise	RF3	T3-1.1	Sep-19	Oct-19	No		
Anna Vader	Anna Vader/Tove M. Gabrielsen	Microbial diversity (DNA and RNA)	rRNA	Protist diversity		Microbial eukaryote diversity across season based on rRNA metabarcoding	UNIS	2019-20	RF3	T3-1.1/T3-1.2/T3-1.3/T3.2.1/	2020	2020	No		Will be analysed partly by PostDoc to be hired august 2020
Anna Vader	Anna Vader/Tove M. Gabrielsen	Microbial activity (RNA)	mRNA	Protist activity		Metatranscriptomics and quantification of gene expression of select genes across season	UNIS	2020	RF3	T3-2.2	2021	2021	No		Will be analysed by PostDoc to be hired august 2020
Anna Vader	Anna Vader/Bodil Bluhm/Camilla Svensen/Kim Præbel	Plankton sample	64 um plankton sample for DNA analysis of diet of small mesozooplankton	Zooplankton diet/prey diversity		Diversity of small zooplankton prey, possibly also zooplankton genetic identification	UNIS/UiT	2019-21	RF3	T4-4.1	2021	2021	Yes, possibly	PhD project	Will be analysed by PhD student to be hired fall 2019
Bodil Bluhm	Anna Vader/Bodil Bluhm/Camilla Svensen/Kim Præbel		Benthos sample from box core for DNA analysis of benthic diets and prey based on DNA	Benthos diet/prey diversity		Diversity of zoobenthos prey, possibly also genetic identification of benthis species	UNIS/UiT	2019-21	RF3	T4-4.1	2021	2021	Yes, possibly	PhD project	Sample type not found in log sheet, should be added
Ane Haarr	Ketil Hylland	Bile (of polar cod, capelin, atlantic cod and american plaice)	quantification of PAH metabolites	concentration of PAH metabolites from individual fish		concentration of PAH metabolites from individual fish	UiO/NIVA	2019-2022	RF2	T2-2.3	2020-2022	2020-2022			will be analysed by PostDoc to be hired
Ane Haarr	Ketil Hylland	Blood (of polar cod, capelin, atlantic cod and american plaice)	quantification of DNA strand breaks	percent DNA damage in individual fish		percent DNA damage in individual fish	UiO	2019-2022	RF2	T2-2.3	2020-2022	2020-2022			will be analysed by PostDoc to be hired
Siv Hoff, Leif Chr. Stige	Sissel Jentoft	Tissue (of capelin, polar cod and cod)	Genomic analysis (individual level)	De novo genome assembly		Whole-genome sequences	UiO	2019-2022	RF2	T2-3.1	2020-2022	2020-2022	Yes, possibly	PhD project	
Siv Hoff, Leif Chr. Stige	Sissel Jentoft	Tissue (of capelin, polar cod and cod)	Genomic analysis (population level)	Population-genetic data (diversity) along climate gradient in two seasons		Whole-genome sequences	UiO	2019-2022	RF2	T2-3.1	2020-2022	2020-2022	Yes, possibly	PhD project	
Siv Hoff, Leif Chr. Stige	Sissel Jentoft	Tissue (of capelin, polar cod and cod)	Investigation of candidate genes	Population-genetic data (linked to function) along climate gradient in two seasons		Population-genomic statistics	UiO	2019-2022	RF2	T2-3.1	2020-2022	2020-2022	Yes, possibly	PhD project	
Bodil Bluhm, Arunima Sen, Eric Jorda	Paul Renaud	Sediment pigment	Fluorometric analysis	mg Chl a / m2, mg phaeopigment / m2	(10.3.18)	Sediment pigments	APN	2019-2021	RF3	T3-1.2	2020	2020-2022	No		
Bodil Bluhm, Arunima Sen, Eric Jorda	Elisabeth Alve & PhD student to be hired	Grain size	Laser Diffraction Particle Size Analyzer (grain size); combustion in muffle furnace (TOC, TN), IRMS (d13C/d15N)	sediment grain size fractions, sediment total organic carbon (TOC, %), sediment total nitrogen (TN, %), d13C (per mil), d15N (per mil)	(10.3.3)	sediment grain size fractions, sediment total organic carbon (TOC, %), sediment total nitrogen (TN, %), d13C (per mil), d15N (per mil)	UiO / UK	2020-2022	RF1, RF3	RF1?, RF3 T3-1.2	2021-2023	2021-2023	possibly	PhD project (foraminifera)	
Bodil Bluhm, Arunima Sen, Eric Jorda	Elisabeth Alve & PhD student to be hired (Foraminifera), Bodil Bluhm (metazoan meiofauna)	Meiofauna abundance	Sorting and morphological identification	number of (taxon) / cm2	(10.3.5)	Foraminifera abundance, diversity and composition; metazoan meiofauna abundance, diversisty and composition	UiO (Foraminifera), UiT / IOPAS (metazoan meiofauna)	2020-2022	RF1, RF3		2021-2023	2021-2023	possibly	PhD project	
Bodil Bluhm, Arunima Sen, Eric Jorda	Paul Renaud	Sediment pigments	HPLC	mg pigment type / m2	(10.3.1)	sediment pigments HPLC	UK (?)	?	RF3, CAO		?	?	yes	PhD project (vert flux)	
Eric Jorda, Arunima Sen, Bodil Bluhm	Eric Jorda, Arunima Sen, Henning Reiss, Paul Renaud	Macrofauna diversity and abundance	Sorting and morphological identification	number of (taxon) / cm2, diversity indexes, community analysis	10.3.6 /10.3.7	Macrofauna abundance, diversity and composition; metazoan macrofauna abundance, diversisty and composition, community analysis	Nord/IOPAN	2019-2020	RF3	T3-1.1, T3-1.2, T3-1.3	2021-2023	2021-2023			
Padmini Dalpadado	Espen Bagøien, Post Doc	Macrozooplankton	Sorting and morphological identification, isotopic analysis	taxonomic composition, biomass	NL v4 7.12.19	Key organims, e.g. Euphausiids and amphipods, Map spatial distribution, taxonomic compostion and biomass indices, temporal and spatial variation in abundance, biomass, diveristy	IMR	2019-2021	RF3	T3-1.1; T3-2.1	2019-2022	2020-2022	No		
Bodil Bluhm, Arunima Sen, Eric Jorda	Lise Øvreås	Microbial diversity (sediment)	Metabarcoding	taxonomic composition, abundance and distribution		Microbial eukaryote diversity in sediment across season based on metabarcoding	UiB	2019-2021	RF3	T3-1.1, T3-1.2, T3-1.3, T3-4.1	2021	?	Unsure		
Robynne Nowicki	Øystein Varpe, Katrine borga, Geir Wing Gabrielsen	Macrozooplankton and fish	Energetics analysis using bomb calorimetry and pollutant remobilization analysis	Energy content; pollutant concentration of polar cod brain		Seasonal variation in macrozooplankton and fish energy content; Seasonal remobilization of pollutants in polar cod	UiT/UNIS/UiO	2020-2021	RF2	T2-2.5	2021	2021-2022	Unsure	PhD project	
Anette Wold; Kasia Dmoch	Janne Søreide & Camilla Svensen	Mesozooplankton taxonomy; Small mesozooplankton taxonomy	Species identification & counts using a stereomicroscope.	ind/m3 & mg dry mass/m3 using species-specific dry mass values from published sources		Mesozooplankton abundance (ind/m3), biomass (mg dry mass/m3) and species composition (species list)	IOPAS	2020	RF3	T3-1.1 & 2.1 T3-2.1 & 2.2	2021-2022	2021-2022			
Anette Wold; Konrad Karlsoon	Janne Søreide	Mesozooplankton biomass; Small mesozooplankton biomass	Dry total sample at 60 C & weight	Total biomass (mg dry weight/m3)		Total biomass of mesozoopankton	UNIS	2019	RF3	T3-1.1 & 2.1 T3-2.1 & 2.2	2021-2022	2021-2022			

Anette Wold; Kasia Dmoch	Camilla Svensen	Gelatinous zooplankton	Species identification & counts	ind/m3; ml/m3		Gelatinous zooplankton abundance (ind/m3), volume & species composition (species list)	Counts and volume measurments done onboard; Species identification NTNU (Sanna Majaneva)	2020	RF3	T3-1.1 & 2.1 T3-2.1 & 2.2	2021-2022	2021-2022			Gelatinous zooplankton were picked out from the standard MIK net, each taxa was counted, weighted (wet weight) and measured volume. A picture was tken of each taxa. Individuals were picked out and stored on ethanol when time permit. Sample type not found in log sheet, should be added.
Anette Wold; Kasia Dmoch; Julia Giebichenstein	Philipp Assmy; Doreen Kohlbach	Stable isotopes		d13C; d14N (species specific?)		Stable isotopes of POM, main zooplankton taxa & fish	UiO	2020	RF3	T3-1.3	2021-2022	2021-2022			Stable isotopes & fatty acid samples have been taken of the same taxa of mesozooplankton, macrozooplankton & fish. These two datasets will be shared between Julia Giebichenstein, Robynne Nowicki & Doreen Kohlbach. Stable isotopes have been sampled by Julia Giebichenstein and will be analysed at UiO. Fatty acids will be analysed by NPI (Doreen Kohlbach)
Anette Wold; Kasia Dmoch	Philipp Assmy; Doreen Kohlbach	Fatty acids	Fatty acid of total lipid (or specific lipid classes?)	Relative amount of fatty acid		Fatty acids of POM, main zooplankton taxa & fish	AWI (in collaboration with Martin Graeve)	2020	RF3	T3-1.3	2021-2022	2021-2022			Dataset shared with Ecotox group (see comment for Stable istope)to be finalised by Philipp Assmy & Doreen Kohlbach
Anette Wold; Kasia Dmoch	Philipp Assmy; Doreen Kohlbach	HBIs				HBI of POM, main zooplankton taxa & fish	?	2020	RF3	T3-1.3	2021-2022	2021-2022			
Anette Wold	Philipp Assmy; Pedro Duarte	Particulate absorbtion													
Fekadu Yadetie, Nadja Brun	Anders Goksoyr	Liver tissue (of capelin, polar cod and cod, long rough dab)	Gene experession analysis (RNA-seq, qPCR), proteomics, EROD assay, vitellogenin assay, viability, possibly chemical analysis	Gene expression		Transcriptomics and quantification of selected genes and proteins across species	UiB	2019-2020	RF2	T2-2.4	2020	2020	No		
Fekadu Yadetie, Nadja Brun	Anders Goksoyr	Calanus spp (C. finmarchicus, C. hyperboreus, C. glacialis)	Gene experession analysis (RNA-seq, qPCR)	Gene expression		Transcriptomics and quantification of selected genes and proteins across species	UiB	2019-2020	RF2	T2-2.4	2020	2020	No		
Bente Edvardsen; Karoline Saubrekka, Anna Vader	Bente Edvardsen; Anna Vader; Tove M. Gabrielsen	Microbial diversity (DNA and RNA)	metabarcoding using rDNA	Protist diversity		Protist diversity, proportional abundance, seasonal dynamics and distribution	UiO and UNIS	2019-2021	RF3	T3.1.1, T3.1.2, T3.2.1	2020	2020-2021	Yes	PhD-project	Part of Karoline Saubrekkas thesis
Bente Edvardsen; Karoline Saubrekka	Bente Edvardsen, Karoline Edvardsen, Luka Supraha	Protist diversity (net hauls and Vivaflow)	Microscopy	taxonomic composition and distribution		LM (live), SEM, TEM (fixed) micrographs of protists. Taxonomic descriptions	UiO	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1		2021-2022	Yes, possibly	PhD-project	Part of Karoline Saubrekkas thesis
Bente Edvardsen, Karoline Saubrekka	Bente Edvardsen, Karoline Saubrekka	Microalgal diversity by cultures	Culture isolation and charcterisation	Taxonomy and phylogeny, improved rDNA reference sequence database of protists in the Arctic		Microalgal strains, morphologcal and genetic (rDNA operon) descriptions, phylogenetic and physiological characterisation. Contribution to reference sequence databases.	UiO	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1		2021-2022	Yes, possibly	PhD-project	Part of Karoline Saubrekkas thesis
Karoline Saubrekka, Bente Edvardsen	Luka Supraha, Karoline Saubrekka	Coccolithophores on PC filters	Scanning electron microscoppy (SEM)	taxonomic composition, abundance and distribution		Coccolithophore diversity, dynamics and distribution	UiO	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1		2021	Yes, possibly	PhD-project	Part of Karoline Saubrekkas thesis
Karoline Saubrekka, Bente Edvardsen, Anette Wold	Philipp Assmy, Rolf Gradinger, Bente Edvardsen	Fixed water samples from Niskin bottles 6 depths and ice stations	Utermöhl cell counts under the microscope	Cell abundances of protists > 10 µm		Phytoplankton/protist abundance	IOPAS	2019-2020	RF3	T3.1.1		2022			We would like to compare metabarcoding results with micoscopical cell counts in Karoline Saubrekkas PhD-project
Martí Amargant-Arumí	Rolf Gradinger	Radioactively labelled algae on GF/F filters	Primary production in situ incubations	Primary production rate (14C uptake)		Vertical profiles of primary production across latitude and seasons	UiT	2019-2020	RF3	T3-1.1/T3-1.2/T3-1.3/T3.2.1/	2020	2021	Yes	PhD-project	
Martí Amargant-Arumí	Rolf Gradinger	Radioactively labelled algae on GF/F filters	Light intensity vs. Photosynthesis curves	Primary production rate (14C uptake)		Primary production response to various light intensitites	UiT	2019-2020	RF3	T3-1.1/T3-1.2/T3-1.3/T3.2.1/	2020	2021	Yes	PhD-project	
Martí Amargant-Arumí	Rolf Gradinger	Isotopically labelled algae on GF/F filters	Nitrogen uptake in situ incubations	d13C, d15N		Ratios of Carbon and Nitrogen stable isotopes before and after incubations, F-ratios of primary production	?	2019-2020	RF3	T3-1.1/T3-1.2/T3-1.3/T3.2.1/	2020	2021	Yes	PhD-project	

Martí Amargant-Arumí	Rolf Gradinger	Fixed water samples and Sterivex filters from experimental bottles	Reciprocal transplant experiments on the primary producers community of Atlantic and Arctic waters	Community composition, cell abundances		Protist DNA sequences, phylogenetic positions and corresponding abundances linked to environmental conditions	UiT	2019-2020	RF3	T3-1.1/T3-1.2/T3-1.3/T3.2.1/	2020	2021	Yes	PhD-project	
Arunima Sen, Eric Jorda, Bodil Bluhm	Paul Renaud	Sediment community incubations	Sediment community oxygen uptake experiments	oxygen uptake mmol / h		oxygen uptake	onboard	2019-2020	RF3	T3-4.3	2019-2020	2020-2021	no		
Bodil Bluhm, Arunima Sen, Eric Jorda	Torstein Pedersen	Megafauna, macrofauna	determined carbon content using combustion	carbon content of benthic invertebrates		carbon content of benthic invertebrates	UiT	2019-2020	RF4	RF4 T4-4	2020	2022?	No		To be confirmed by Torstein Pedersen
Bodil Bluhm, Arunima Sen, Eric Jorda	Bodil Bluhm, Andreas Altenburger	Megafauna taxonomy	Museum archival	Taxonomic voucher inventory of Nansen Legacy fauna collected		Taxonomic voucher inventory of Nansen Legacy fauna collected	UiT Museum	2020-2023	RF3	T3-3.1	n/a	n/a	No		Museum archival timeline tbd by new collection employee
Bodil Bluhm, Arunima Sen, Eric Jorda	Bodil Bluhm, Lis Jørgensen	d13C / d15N organisms (mostly benthic)	IRMS coupled to C/N analyser	d13C, d15N		Carbon and nitrogen stable isotope composition	UiO (Nansen Legacy agreement?)	2021-2023	RF3	T3-3.4	2022-2023	2023	possibly	Post doc project	
Arunima Sen, Eric Jorda, Bodil Bluhm	Elisabeth Alve, Paul Renaud, Henning Reiss	d13C / d15N	IRMS coupled to C/N analyser	Uptake of isotopically enriched algae in respiration incubation experiment		Carbon and nitrogen stable isotope composition after incubation	?	2021-2023	RF3	T3-3.4	2021-2023	2021-2023	possibly	PhD-project	
Arunima Sen, Eric Jorda, Bodil Bluhm	Paul Renaud, Henning Reiss	Nutrient concentrations in incubations	nutrient analyzer	Macronutrient concentrations in bottom water before and after incubation		Macronutrient concentrations in bottom water before and after incubation	APN	2019-2020	RF3	T3-3.4	2021-2023	2021-2023	no		
Stephen Kohler, Nicolas Sanchez	Murat V. Ardelan, Stephen Kohler	Total mercury and methylmercury	Cold vapor atomic fluorescence spectrometry (CVAFS) for THg and MeHg, or GC-SF-IR-ICPMS for MeHg	THg, MeHg in pM		Total mercury and methylmercury transect profile	Mediterranean Institute of Oceanography (MiO) in Marseille, France	2019	RF2	T2-2.2	2020-2021	2021	yes	PhD project	Stephen Kohler PhD project
Griselda Anglada-Ortiz	Tine L. Rasmussen	Plankton sample	Carbonate contribution (from the abundances of marine calcifiers)	mg CaCO3/m3, (% and #/m3)		Relative and absolute abundance of marine calcifiers on the water column and their contribution to the carbonate pump	CAGE-UiT (Tromsø), ICTA-UAB (Barcelona)	2020	RF2	T2-1.4	2021	2021	yes	PhD project	
Griselda Anglada-Ortiz	Melissa Chierici and Agneta Fransson	Water samples from the CTD	Carbonate chemistry and chemical parameters			DIC/Alkalinity, d18O and nutrients	IMR and NPI		RF2	T2-1.1					
Miriam Marquardt	Marit Reigstad, Gunnar Bratbak	POC/PON	CN analyses	µg/L	Version 4 Nansen Legacy Sampling Protocol, chapter 7.4 - needs updates!!!	POC/PON	UiT/UiB	2020-2023	RF3	T3 1.2	2020-2023	2021-23	yes	PhD-project	
Miriam Marquardt	Miriam Marquardt, Rolf Gradinger	Nutrients from sea ice cores/meltponds/under ice water	Nutrient analyzer	µg/L		Nutrients	UiT	2020-2023	RF3		2020-2023				
Miriam Marquardt	Miriam Marquardt, Rolf Gradinger, Bodil Bluhm	Ice meiofauna abundance/taxonomy	Microscopy	Ind/m3; ml/m3		Ice meiofauna abundance/taxonomy	UiT	2020-2023	RF3		2020-2023				
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak	Bacterial activity (Radioactively labelled bacteria)	Bacterial production of carbon biomass	Bacterial production rate ([2,3,4-3H] leucine) in µgC L-1-d-1		Bacterial production rate	UiB	2019-2020	RF3	T3-2.3/T3-3.1/	2020	2021	No		Confirm with the PI
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak, Aud Larsen	Microbial abundance	Flow cytometry	Planktonic cell per ml		Abundance tables	UiB	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1	2020	2021	No		Confirm with the PI
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak	SEM filter	Scanning electron microscoppy (SEM)	Qualitative analysis of small plankton		Plankton diversity, dynamics and distribution	UiB	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1	2020	2021	No		Confirm with the PI
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak, Jorun K. Egge, Tatiana Tsagaraki	XRF filter	X-Ray Fluorescence (XRF)	Concentration of total particulate elements in µM		Concentration of total particulate O, P, Na, Mg, Si, S, Ca, Mn, Fe, Zn (µM)	UiB	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1	2020	2021	No		Confirm with the PI
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak, Ruth-Anne Sandaa	Virus diversity	Recover viruses from natural waters via iron chloride precipitation	Virus diversity		Virus diversity across season based on metabarcoding	UiB	2019-2020	RF3	T3.1.1, T3.1.2, T3.2.1	2020	2021	No		Confirm with the PI
Oliver Müller, Lasse Mørk Olsen	Gunnar Bratbak, Oliver Müller, Lasse Mørk Olsen	Grazer exclusion experiment	Bacterial production, Flow Cytometry, microbial diversity, nutrient analysis, microzooplankton diversity	Bacterial production, Flow Cytometry, microbial diversity, nutrient analysis, microzooplankton diversity		Dynamics of lower trophic level food web structure	UiB	2019-2020	RF3	T3-4.1	2020	2021	No		Confirm with the PI
Nicolas Sanchez, Stephen Kohler	Murat V. Ardelan	Total trace elements and dissolved trace elements	Preconcentration via SeaFAST and ICP-MS	Concentration of elements in nM		Total and dissolved trace elements transect profile	NTNU	2019-2020	RF2	T2-2.2	2020	2021	Need to ask PI		Confirm with the PI
Nicolas Sanchez, Stephen Kohler	Murat V. Ardelan	Dissolved organic matter characterization, TOC	HPLC-MS and TOC-L	Type and composition of DOM, TOC	Nansen Legacy v4 7.5 &7.6	Variation, composition, and distribution of DOM and TOC, with ancillary POC and DOC measurements	NTNU (DOM characterization) and UCSB (TOC)	2019-2020	RF2	T2-2.2	2020	2021	yes	phd project	Maria Digernes PhD project
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	Chlorophyll a	fractionated algal pigments, filtered through GF/F filters from sediment trap samples	Chl a total	NL v4 chapter 8	Chlorophyll a	Onboard KPH	During cruise	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	Chlorophyll a >10µm	fractionated algal pigments, filtered through Polycarbonate filters from sediment trap samples	Chl a >10µm	NL v4 chapter 8	Chlorophyll a >10µm	Onboard KPH	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	

Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	POC/PON	CN analyses from sediment trap samples	µg/L	NL v4 chapter 8	POC/PON	UiT	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	stable isotopes	from sediment trap samples	d13C; d14N	NL v4 chapter 8	stable isotopes	UiT?	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Paul Renaud, Yasemin Bodur	water column pigments	HPLC from sediment trap samples	mg pigment type / m2	NL v4 chapter 8	HPLC	APN?	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Paul Renaud, Yasemin Bodur	sea ice algae proxy	IP25 from sediment trap and boxcore samples	mg pigment type / m2	NL v4 chapter 8	IP25	not clear	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	phytoplankton communities	from sediment trap samples	community composition and counts	NL v4 chapter 8	phytoplankton communities	UiT	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	fecal pellets	from sediment trap samples	fecal pellet types and counts	NL v4 chapter 8	fecal pellets	UiT	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur, Miriam Marquardt	Marit Reigstad, Yasemin Bodur	Metatranscriptomics	DNA/RNA from sediment trap samples	biological diversity & activity on particles	not established	Metatranscriptomics	UiT?	2019-21	RF3	T3 4.4	2020	2021	yes	PhD-project	
Yasemin Bodur	Paul Renaud, Yasemin Bodur	Pandalus borealis	indidivuals stored at -20C or in formaldehyde from Campelen trawl	whole animals for stable isotopes, fatty acids extraction and gut content analyses	not established	fatty acids, stable isotoes, gut content	APN?	2019-21	RF3		2020	2021	yes?	PhD-project	
Angela Stippkugel	Nicole Aberle-Malzahn	Two point dilution	Flow Cytometry, nutrient	Flow Cytometry, nutrient		Dynamics of lower trophic level	NTNU	2018 - 2021	RF3	T3-3.1, T3-4.2	2021	2021	Yes, possibly	PhD project	PhD position was now
Christine Gawinski	Camilla Svensen	Productivity of Oithona	Egg hatching experiment	egg production rate, weight specific egg production rate	not established	specific egg production rate as estimate for copepod production	UiT	2019 - 2021	RF3	T3-2.2	2020	2021	yes	PhD project	
Håvard N. Liholt, Ane Haarr, Julia Giebichensten	Katrine Borgå	frozen (-20C) whole and dissected fishes: muscle, otoliths, stomach	stable isotopes, mercury, persistent organic pollutants, emerging contaminants, fatty acid analyses	food web contaminant biomagnification	NL V4	food web contaminant biomagnification	UiO / NP / NILU	2019-2021	RF2	T2-2.1	2021	2022	yes	PhD project	Hg and SI analyses will be done at UiO, fatty acid analyses by post-doc at NP, if she needs this data. Organic pollutants will be anbalysed at NILU
Julia Giebichenstein, Rita Amundsen	Katrine Borgå	Meso- and Macrozooplankton	stable isotopes, mercury, persistent organic pollutants analyses, emerging contaminants, fatty acid analyses	food web contaminant biomagnification	NL V4	food web contaminant biomagnification	UiO /NILU/NP	2019-2021	RF2	T2-2.1	2021	2022	yes	PhD project	Hg and SI analyses will be done at UiO, fatty acid analyses by post-doc at NP, if she needs this data. Organic pollutants will be anbalysed at NILU
Julia Giebichenstein, Rita Amundsen	Katrine Borgå	In-situ filtration pump	persistent organic pollutant analyses	food web contaminant biomagnification	NL V4	food web contaminant biomagnification	UiO/NILU	2019-2021	RF2	T2-2.1	2021	2022	yes	PhD project	
Julia Giebichenstein	Katrine Borgå	PFAS water samples	PFAS analyses	food web contaminant biomagnification	NL V4	food web contaminant biomagnification	UiO	2019-2022	RF2	T2-2.1	2022	2022	yes	PhD project	
Stephen Kohler, Nicolas Sanchez	Murat V. Ardelan	Sediment samples	Sequential extraction for trace elements	Trace element concentrations	Nansen Legacy v4 10.4	Distribution of trace elements in sediments	NTNU	2019-2020	RF2	T2-2.2	2021	2021	maybe, check with PI		
Christine Gawinski, Oliver Müller, Lasse Mørk Olsen	Camilla Svensen	Grazing experiment of Oithona and Calanus	Bacterial production, Flow Cytometry, microbial diversity, microzooplankton diversity	Bacterial production, Flow Cytometry, microbial diversity, microzooplankton diversity	Samples will be analyzed at UiB	Influence of Oithona and Calanus on the microbial food web (top down control?), comparison between the two different feeding strategies	UiB	2019-2020	RF3	T3-4.1	2020	2021	yes	PhD project	
Christine Gawinski	Camilla Svensen	Carbon samples of Oithona females and egg sacks	Determine weight specific egg production rate	weight specific egg production rate	not established	Estimation of the copepod production during August 2019	UiT	2019 - 2021	RF3	T3-2.2	2020	2021	yes	PhD project	
Julia Giebichenstein, Christine Gawinski	Camilla Svensen	stable isotopes	from Oithona	d13C; d14N (species specific?)	samples will be analysed by Julia Giebichstein	Determine trophic position of Oithona	UiO	2019 - 2021	RF3		2020	2021	yes	PhD project	
Christine Gawinski	Doreen Kohlbach	fatty acids	from Oithona	Relative amount of fatty acid	samples will be analysed by Doreen Kohlbach	determine the quality of food of Oithona in different seasons	NPI	2019 - 2021	RF3		2020	2021	yes	PhD project	
Christine Gawinski, Anna Vader, Bodil Bluhm	Anna Vader	Experimental animals of Oithona and calanus grazing experiment	metabarcoding of prey items		Genetically determine prey of Oithona and Calanus from feeding experiment and compare to flow cytometry results	Diet of Calanus and Oithona	UiT and UNIS	2020-2021	RF3		2020	2021	yes	PhD project	Analyses to be done by Snorre Flo as part of PhD project
Jack Garnett	Jack Garnett	Sea ice cores/meltponds/under ice water	Analysis of PFAS (dissolved & particulate, salinity, stable isotopes			PFAS in the sea ice ecosystem	UK	2019-20	RF2			2021		PhD project	Project outside Nansen Legacy
Jon Leithe	Marit Reigstad	Sea ice observations				Sea ice type, extension, etc			RF1			2019			Published at icewatch.met.no

Gear ID with metadata

ID	Event ID	Gear Type	Date	Time (UTC)	Cruise number	Station Name	Latitude	Longitude	Bottom Depth (m)	Local Station ID	Sample Depth (m)	Maximum depth(m)	Minimum depth (m)	Start Date	End Date	Event Remarks	Sampling protocol	Data filename	Serial Number	Recorded By	Principal investigator (PI)	PI email	PI institution
	ef09b3b3-b5ec-11e9-acd1-a0481c9e7d26	EK80			2019706									2019-08-05	27/08/2019			KHFL2019706-D20190MMDD-THHMMSS.raw, 2019MMDDHHMMSS.idx		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b3b4-b5ec-11e9-acd1-a0481c9e7d26	EM302			2019706									2019-08-05		Multibeam mapping NW		KHFL2019706-D20190MMDD-THHMMSS.*, KHEM2019706-D20190MMDD-THHMMSS.*	105	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b3b5-b5ec-11e9-acd1-a0481c9e7d26	Weather station			2019706									2019-08-05		Vaisala AWS430. Data		AWS430__SMSAWS__Date.txt		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b3b6-b5ec-11e9-acd1-a0481c9e7d26	Thermosalinograph			2019706									2019-08-05	2019-08-14			Date-number-4m.cnv		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b3b7-b5ec-11e9-acd1-a0481c9e7d26	ADCP 150 kHz			2019706									2019-08-05				KHDateFL_number_0000.*		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b3b8-b5ec-11e9-acd1-a0481c9e7d26	pCO2 underway			2019706									2019-08-05				pco2_data_ext_Date.*		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
157	8135fec6-b7fe-11e9-8f48-000c29fb4a96	CTD w/bottles	2019-08-05	16:13	2019706	IsA	78.2609	15.5353	86.5	145	75					Samples collected as part of other projects, not AeN	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0145	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
158	2158eef8-b8f5-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-06	07:34	2019706	W of Sørkapp	76.4165	13.9047	1050.28	146	500					Water for preparation of sediment traps	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0146	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
159	2158eef9-b8f5-11e9-8f49-000c29fb4a96		2019-08-06	09:53	2019706	W of Sørkapp	76.4165	13.9046	1050.28	42				2019-08-06		Glider 1, to be picked up outside Isfjorden				Tove M. Gabrielsen	Marit Reigstad/Ilker Fer	marit.reigstad@uit.no	UiT The Arctic University of Norway
160	23b9599c-b91f-11e9-8f49-000c29fb4a96		2019-08-07	13:40	2019706	P1 vicinity	76.0051	31.0345	327.52	43				2019-08-07	2019-08-23	Glider 2, picked up by KV Andenæs				Tove M. Gabrielsen	Marit Reigstad/Ilker Fer	marit.reigstad@uit.no	UiT The Arctic University of Norway
161	23b9599d-b91f-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-07	14:04	2019706	P1 vicinity	76.0068	31.0313	328.17	147	320					Water for benthic experiments	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0147	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
162	ef09b276-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-07	16:58	2019706	P1	76.0000	31.2198	325.59	148							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0148	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
163	ef09b277-b5ec-11e9-acd1-a0481c9e7d26	WP3 1000 um	2019-08-07	17:48	2019706	P1	76.0000	31.2199	325.62	12		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
164	ef09b278-b5ec-11e9-acd1-a0481c9e7d26	WP3 1000 um	2019-08-07	18:24	2019706	P1	76.0000	31.2198	325.69	13		315	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
165	ef09b279-b5ec-11e9-acd1-a0481c9e7d26	WP3 1000 um	2019-08-07	19:17	2019706	P1	76.0000	31.2198	325.73	14		315	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
166	ef09b27a-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-07	19:32	2019706	P1	76.0000	31.2198	325.58	15		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
167	ef09b27b-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-07	19:51	2019706	P1	76.0000	31.2198	325.73	16		315	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
168	ef09b27c-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-07	20:31	2019706	P1	76.0000	31.2198	325.41	17		315	0			Both 64 um and 180 um mounted				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
169	ef09b27d-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-07	21:06	2019706	P1	76.0000	31.2198	325.52	18		315	0			Both 64 um and 180 um mounted				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
170	ef09b27e-b5ec-11e9-acd1-a0481c9e7d26	Sediment trap (short term)	2019-08-07	22:19	2019706	P1	76.0000	31.2198	324.99	44				2019-08-07	2019-08-08	Retrieved 23:48 (Cruise logger)				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
171	ef09b27f-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-07	23:20	2019706	P1	76.0000	31.2194	325.31	45										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
172	9acda646-b9dd-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-08	00:46	2019706	P1	76.0000	31.2194	325.44	149						WHS300-I-UG502; SN	Sampling Protocols v4	Sta0149		Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
174	9acda647-b9dd-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-08	03:24	2019706	P1	76.0196	31.2897	330.8	20		320	0			V-haul; heaving speed acc to protocol found too fast, adjusted	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
175	b5c4ffa8-b9dd-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-08	04:09	2019706	P1	76.0057	31.2396	325.41	21		320	0			V-haul; heaving speed acc to protocol found too fast, adjusted	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
176	9acda648-b9dd-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-08	04:57	2019706	P1	75.9915	31.1894	323.19	22		320	0			V-haul; heaving speed acc to protocol found too fast, adjusted	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
177	b5c4ffa9-b9dd-11e9-8f49-000c29fb4a96	Campelen trawl	2019-08-08	06:48	2019706	P1	76.0479	31.0987	333.37	101							Nansen Legacy Sampling protocols v4 July 12 2019, 10.2.3; bottom time 45 min		1724	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
178	9acda649-b9dd-11e9-8f49-000c29fb4a96	Phytoplankton net 10 um	2019-08-08	08:48	2019706	P1	76.0033	31.2137	326.21	23		50	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 50-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
179	a82ebb72-b9dd-11e9-8f49-000c29fb4a96	Phytoplankton net 10 um	2019-08-08	09:01	2019706	P1	76.0033	31.2137	326.14	24		50	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 50-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
180	b5c4ffaa-b9dd-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-08	09:21	2019706	P1	76.0031	31.2141	325.86	150							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0150	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
182	b5c4ffab-b9dd-11e9-8f49-000c29fb4a96	Multinet 64 um	2019-08-08	11:35	2019706	P1	76.0000	31.2201	325.53	25		290	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
183	a82ebb74-b9dd-11e9-8f49-000c29fb4a96	Multinet 64 um	2019-08-08	12:17	2019706	P1	76.0000	31.2201	322.75	26		290	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
184	c82a2d3a-b9dd-11e9-8f49-000c29fb4a96	Multinet 180 um	2019-08-08	12:55	2019706	P1	76.0000	31.2200	325.37	27		290	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
185	7063be80-ba42-11e9-8f49-000c29fb4a96	Bongonet 64 um	2019-08-08	13:24	2019706	P1	76.0000	31.2200	321.15	28		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
186	7d56ebe4-ba42-11e9-8f49-000c29fb4a96	Bongonet 64 um	2019-08-08	13:55	2019706	P1	76.0000	31.2200	324.16	29		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
187	7063be81-ba42-11e9-8f49-000c29fb4a96	Bongonet 180 um	2019-08-08	15:45	2019706	P1	76.0000	31.2201	322.25	30		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
188	7d56ebe6-ba42-11e9-8f49-000c29fb4a96	Macroplankton trawl	2019-08-08	17:21	2019706	P1	76.0361	31.0716	332.48	102									1723	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
189	7063be82-ba42-11e9-8f49-000c29fb4a96	Harstad trawl	2019-08-08	19:34	2019706	P1	76.0355	31.0876	337.22	103									1720	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
190	8d667d06-ba42-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-08	20:50	2019706	P1	75.9986	31.2265	325.61	151						With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0151	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

191	7063be83-ba42-11e9-8f49-000c29fb4a96	GO-FLO	2019-08-08	22:14	2019706	P1	75.9986	31.2265	325.11	47									Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
192	8ef92198-bbe9-11e9-8f49-000c29fb4a96	Box core	2019-08-09	01:27	2019706	P1	75.9997	31.2153	326.11	9							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
193	8ef92199-bbe9-11e9-8f49-000c29fb4a96	Box core	2019-08-09	03:46	2019706	P1	75.9998	31.2154	325.9	10							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
194	8ef9219a-bbe9-11e9-8f49-000c29fb4a96	Box core	2019-08-09	06:00	2019706	P1	75.9997	31.2154	324.81	11							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer		1720	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
195	8ef9219b-bbe9-11e9-8f49-000c29fb4a96	Harstad trawl	2019-08-09	09:46	2019706	Betw P1 and NLEG2	76.2095	31.2316	315.83	104										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
199	caf30396-bc46-11e9-8f49-000c29fb4a96	Mooring	2019-08-11	05:38	2019706	M5	77.0803	35.0381	145.56	48						Mooring M5 N 77 04,516 E 35 02,168				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
200	caf30397-bc46-11e9-8f49-000c29fb4a96	Mooring	2019-08-11	05:46	2019706	M5 bioac	77.0825	35.0578	147.18	49						Mooring M5 bioac 77 04.947n 035 03.487e				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
201	caf30398-bc46-11e9-8f49-000c29fb4a96	CTD	2019-08-11	08:21	2019706	Betw M5 and P2	77.3252	34.4502	158.54	154						Test MoonPool betw M5 & P2	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0154	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
202	caf30399-bc46-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-11	10:56	2019706	P2	77.4986	34.0011	188.66	155							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0155	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
203	dd2da098-bc46-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-11	11:59	2019706	P2	77.4987	34.0012	188.87	156	178					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0156	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
204	dd2da099-bc46-11e9-8f49-000c29fb4a96	Phytoplankton net 10 um	2019-08-11	12:43	2019706	P2	77.4986	34.0012	188.84	31	100	0					Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
205	dd2da09a-bc46-11e9-8f49-000c29fb4a96	Phytoplankton net 10 um	2019-08-11	13:02	2019706	P2	77.4985	34.0005	187.97	32	100	0					Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
207	dd2da09b-bc46-11e9-8f49-000c29fb4a96	WP3 1000 um	2019-08-11	14:09	2019706	P2	77.4986	34.0008	188.57	34	150	0								Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
208	2f3eab06-bcbb-11e9-8f49-000c29fb4a96	WP3 1000 um	2019-08-11	14:42:00	2019706	P2	77.4986	34.0007	188.34	35	150	0								Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	2f3eab07-bcbb-11e9-8f49-000c29fb4a96	WP3 1000 um	2019-08-11		2019706	P2	77.4986	34.0007	188.34		150	0				Missing from cruise logger; Position and depth taken from ID208				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
209	2f3eab08-bcbb-11e9-8f49-000c29fb4a96	Campelen trawl	2019-08-11	15:18:00	2019706	P2	77.5156	33.9343	186.95	105							Nansen Legacy Sampling protocols v4 July 12 2019, 10.2.3; bottom time 30 min		1724	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
210	2f3eab09-bcbb-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-11	16:42:00	2019706	P2	77.5010	33.9502	186.73	36	160	0				V-haul; heaving speed acc to protocol found too fast, adjusted	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
211	4449d11a-bcbb-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-11	17:30:00	2019706	P2	77.4990	33.9955	188.18	37	160	0				V-haul; heaving speed acc to protocol found too fast, adjusted	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
212	4449d11b-bcbb-11e9-8f49-000c29fb4a96	MIK-net 1500 um	2019-08-11	18:03:00	2019706	P2	77.5085	33.9661	190.79	38	170	0				Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
213	4449d11c-bcbb-11e9-8f49-000c29fb4a96	GO-FLO	2019-08-11	19:10:00	2019706	P2	77.5006	33.9865	186.15	50										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
214	4449d11d-bcbb-11e9-8f49-000c29fb4a96	Active water sampler	2019-08-11	20:47:00	2019706	P2	77.5006	33.9864	186.08	51						Filtration pump				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
215	5ec60626-bcbb-11e9-8f49-000c29fb4a96	TS probe	2019-08-12	01:14:00	2019706	P2	77.5006	33.9864	186.33	1						TS probe				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
216	5ec60629-bcbb-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-12	02:11:00	2019706	P2	77.5006	33.9865	186.3	157	175					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0157	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
217	5ec60627-bcbb-11e9-8f49-000c29fb4a96	Multinet 180 um	2019-08-12	03:19:00	2019706	P2	77.5006	33.9865	186.36	39		170	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
218	5ec60628-bcbb-11e9-8f49-000c29fb4a96	Multinet 64 um	2019-08-12	03:53:00	2019706	P2	77.5006	33.9864	186.38	40		170	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
219	00fe1b14-bd6a-11e9-8f49-000c29fb4a96	Multinet 64 um	2019-08-12	04:43:00	2019706	P2	77.5006	33.9865	186.47	41		150	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
221	0c747bdf-bd6a-11e9-8f49-000c29fb4a96	Macroplankton trawl	2019-08-12	06:56:00	2019706	P2	77.5163	34.0057	193.53	106									1723	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
224	00fe1b15-bd6a-11e9-8f49-000c29fb4a96	Box core	2019-08-12	08:38:00	2019706	P2	77.4994	34.0008	188.46	12							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
225	0c747bde-bd6a-11e9-8f49-000c29fb4a96	Box core	2019-08-12	11:01:00	2019706	P2	77.4994	34.0008	188.6	13							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
226	00fe1b16-bd6a-11e9-8f49-000c29fb4a96	Box core	2019-08-12	12:57:00	2019706	P2	77.4995	34.0007	188.78	14							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
227	20db6caf-bd6a-11e9-8f49-000c29fb4a96	Bongonet 180 um	2019-08-12	13:28:00	2019706	P2	77.4995	34.0007	188.87	45		170	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
228	00fe1b17-bd6a-11e9-8f49-000c29fb4a96	Bongonet 64 um	2019-08-12	13:56:00	2019706	P2	77.4995	34.0007	188.95	46		170	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
229	0c747bdc-bd6a-11e9-8f49-000c29fb4a96	Bongonet 64 um	2019-08-12	14:19:00	2019706	P2	77.4995	34.0007	188.88	47										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
230	20db6cae-bd6a-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-12	18:11:00	2019706	NLEG5	77.9989	33.9998	196.18	158	181						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0158	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

231	0c747bdd-bd6a-11e9-8f49-000c29fb4a96	Mooring	2019-08-12	21:22:00	2019706	M5	78.3478	34.7624	241.23	52						Rigg M6 - N 78 20 869 E				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
232	20db6cac-bd6a-11e9-8f49-000c29fb4a96	CTD	2019-08-12	21:30:00	2019706	M5	78.3498	34.7751	246.96	159						At mooring site; With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0159	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
233	20db6cad-bd6a-11e9-8f49-000c29fb4a96	CTD w/bottles	2019-08-12	23:41:00	2019706	NLEG6	78.5000	34.0004	179.89	160	170						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0160	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
234	ef09b280-b5ec-11e9-acd1-a0481c9e7d26	Campelen trawl	2019-08-13	02:11	2019706	P3	78.7318	34.0098	307.25	107							Nansen Legacy Sampling protocols v4 July 12 2019, 10.2.3; bottom time 15 min, with fish lift		1723	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
235	ef09b281-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-13	03:27	2019706	P3	78.7498	34.0008	306.99	161	300					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472		Sta0161	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
236	ef09b282-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-13	04:12	2019706	P3	78.7498	34.0006	306.98	53										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
237	ef09b283-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-13	05:10	2019706	P3	78.7502	34.0004	307.11	48						V-haul	Nansen Legacy Sampling protocols v4 July 12 2019, 9.3.5 MIK net manual; heaving speed similar to deploying			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
239	ef09b284-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-13	06:20	2019706	P3	78.7500	34.0000	306.8	50		280	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
240	ef09b285-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-13	06:58	2019706	P3	78.7500	34.0000	306.77	51		280	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
241	ef09b286-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-13	07:29	2019706	P3	78.7500	34.0000	306.71	52		100	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
242	ef09b287-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-13	09:40	2019706	NLEG08	79.0003	33.9997	269.57	162	260						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0162	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
243	ef09b288-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-13	12:12	2019706	NLEG09	79.2492	34.0018	215.73	163	205						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0163	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
244	ef09b289-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-13	14:26	2019706	NLEG10	79.5002	33.9966	300.18	164	290						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0164	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
245	ef09b28a-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-13	17:46	2019706	P4	79.7494	33.9971	338.39	165	325						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0165	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
246	ef09b28b-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-13	18:31	2019706	P4	79.7475	33.9880	338.83	53		100	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
247	ef09b28c-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-13	18:49	2019706	P4	79.7476	33.9853	338.43	54		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
248	ef09b28d-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-13	19:01	2019706	P4	79.7477	33.9827	338.11	55		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
249	ef09b28e-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-13	19:12	2019706	P4	79.7478	33.9801	337.72	56		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
250	ef09b28f-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-13	19:33	2019706	P4	79.7485	33.9737	337.7	57		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
251	ef09b290-b5ec-11e9-acd1-a0481c9e7d26	WP3 1000 um	2019-08-13	20:14	2019706	P4	79.7517	33.9588	336.24	58		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
252	ef09b291-b5ec-11e9-acd1-a0481c9e7d26	Sediment trap (short term)	2019-08-13	21:40	2019706	P4	79.7578	33.9657	329.89	54				2019-08-13	2019-08-14					Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
253	ef09b292-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-13	21:51	2019706	P4	79.7584	33.9733	330.05	59		100	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
254	ef09b293-b5ec-11e9-acd1-a0481c9e7d26	Active water sampler	2019-08-13	23:35	2019706	P4	79.7584	34.0766	326.97	55						In situ filtration pump	To be included in v5			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
255	ef09b294-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-14	02:19	2019706	P4	79.7343	34.2372	344.53	56										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
257	ef09b295-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-14	04:26	2019706	P4	79.7077	34.2833	351.99	60						Vertical haul	Nansen Legacu Sampling Protocols v4 July 12 2019 9.3.5. Mik net manual;			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
258	ef09b296-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-14	05:03	2019706	P4	79.7026	34.2815	354.2	61		320	0			Vertical haul	Nansen Legacu Sampling Protocols v4 July 12 2019 9.3.5. Mik net manual; adjusted haul speed to ca 0.25 m/s because no weight			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
259	ef09b297-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-14	05:51	2019706	P4	79.6941	34.2683	356.7	62		320	0			Vertical haul	Nansen Legacu Sampling Protocols v4 July 12 2019 9.3.5. Mik net manual; adjusted haul speed to ca 0.25 m/s because no weight			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
260	ef09b298-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-14	06:43	2019706	P4	79.6931	34.2520	355.31	63		320	0			Vertical haul	Nansen Legacu Sampling Protocols v4 July 12 2019 9.3.5. Mik net manual; adjusted haul speed to ca 0.25 m/s because no weight			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
261	ef09b299-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-14	07:24	2019706	P4	79.6932	34.2300	352.99	166	340					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472		Sta0166	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
262	ef09b29a-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-14	08:33	2019706	P4	79.6964	34.2245	345.53	64		325	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

263	ef09b29b-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-14	09:13	2019706	P4	79.7002	34.2237	341.7	65		280	0								Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
264	ef09b29c-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-14	10:10	2019706	P4	79.7073	34.2281	342.63	66		325									Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
266	ef09b29e-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-14	11:06	2019706	P4	79.7140	34.2664	341.28	167	330						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0167	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
267	ef09b29f-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-14	11:43	2019706	P4	79.7179	34.2909	343.08	67		330	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
268	ef09b2a0-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-14	12:12	2019706	P4	79.7203	34.3065	343.78	68		330	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
269	ef09b2a1-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-14	12:41	2019706	P4	79.7211	34.3182	341.63	69		330	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
270	ef09b2a2-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-14	13:15	2019706	P4	79.7226	34.3311	338.9	168	329						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0168	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
271	ef09b2a3-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-14	13:52	2019706	P4	79.7233	34.3442	337.3	169		50	0			SAIV CTD		Sta0169	612	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
272	ef09b2a4-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-14	14:11	2019706	P4	79.7230	34.3530	336.49	58										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
273	ef09b2a5-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-14	16:13	2019706	P4	79.7111	34.3772	338.16	3										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
274	ef09b2a6-b5ec-11e9-acd1-a0481c9e7d26	Campelen trawl	2019-08-14	19:50	2019706	P4	79.5518	34.5686	328.4	108							Nansen Legacy Sampling protocols v4 July 12 2019, 10.2.3; bottom time 15 min, with fish lift		1724	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
275	ef09b2a7-b5ec-11e9-acd1-a0481c9e7d26	Macroplankton trawl	2019-08-14	20:56	2019706	P4	79.4983	34.6344	304.77	109									1723	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
276	ef09b2a8-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-15	01:37	2019706	P4	79.7457	34.0169	333.83	15							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
277	ef09b2a9-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-15	03:10	2019706	P4	79.7434	33.9961	332.7	16							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
278	ef09b2ce-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-15	04:51	2019706	P4	79.7518	34.0282	331.05	17							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
279	ef09b2cf-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-15	08:22	2019706	NLEG12	79.9982	33.9961	211.8	170	204					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0170	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
280	ef09b2d0-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-15	17:03	2019706	P5	80.4966	33.9898	162.71	171	150					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0171	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
281	ef09b2d1-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-15	17:44	2019706	P5	80.4951	33.9678	159.36	172						SAIV CTD		Sta0172	612	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
282	ef09b2d2-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-15	17:55	2019706	P5	80.4949	33.9620	159.3	70		140	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
283	ef09b2d3-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-15	18:16	2019706	P5	80.4951	33.9502	154.82	71		140	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
284	ef09b2d4-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-15	18:31	2019706	P5	80.4954	33.9424	159.12	72		140	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
285	ef09b2d5-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-15	18:47	2019706	P5	80.4957	33.9353	160.85	73		100	0				Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
286	ef09b2d6-b5ec-11e9-acd1-a0481c9e7d26	Sediment trap (short term)	2019-08-15	20:32	2019706	P5	80.5006	33.8810	157.14	59		100	0	2019-08-15	2019-08-16					Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
287	ef09b2d7-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-15	21:05	2019706	P5	80.5092	33.8602	162.19	74										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
288	ef09b2d8-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-15	21:16	2019706	P5	80.5117	33.8545	168.54	75		140	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
289	ef09b2d9-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-15	21:35	2019706	P5	80.5163	33.8551	169.2	76		140	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
290	ef09b2da-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-15	22:41	2019706	P5	80.5245	33.8928	171.81	60		140	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
291	ef09b2db-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-16	00:23	2019706	P5	80.5289	33.9602	169.77	173							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0173	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
292	ef09b2dc-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-16	00:55	2019706	P5	80.5273	33.9844	174.35	4										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
293	ef09b2dd-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-16	04:12	2019706	P5	80.4952	34.0860	162.0	77		140	0			Scanmar did not work, bottom depth ca 162m				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
294	ef09b2de-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-16	04:49	2019706	P5	80.4884	34.0835	159.99	78		140	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
295	ef09b2df-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-16	06:16	2019706	P5	80.4771	34.0669	157.25	79		150	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
296	ef09b2e0-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-16	06:39	2019706	P5	80.4749	34.0641	155.24	80										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
297	ef09b2e1-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-16	07:09	2019706	P5	80.4737	34.0620	154.77	81										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
298	ef09b2e2-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-16	07:30	2019706	P5	80.4736	34.0579	152.96	82		1								Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
299	ef09b2e3-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-16	09:03	2019706	P5	80.4772	34.0514	154.64	174	152					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0174	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
300	ef09b2e4-b5ec-11e9-acd1-a0481c9e7d26		2019-08-16	10:08	2019706	P5	80.4843	34.0677	159.33	61						Event 300 i toktlogger dekker Li-Cor og CTD i registreringen under				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	b2d90c55-c02b-11e9-8f49-000c29fb4a96		2019-08-16	10:15	2019706	P5	80.4846	34.0575	162.0			20	0			Li-Cor (UNIS) lysmålinger (Miriam, Jon)				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	b2d90c54-c02b-11e9-8f49-000c29fb4a96	CTD	2019-08-16	10:30	2019706	P5	80.4846	34.0575	162.0							SAIV UNIS 612 fra småbåt (Miriam, Jon)			612	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
303	ef09b2e6-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-16	11:57	2019706	P5	80.5021	34.0173	160.68	19										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
306	ef09b2e7-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-16	23:06	2019706	NLEG14	81.0018	33.9996	219.56	175	219						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0175	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

307	ef09b2e8-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-17	05:56	2019706	NLEG15	81.3118	31.3503	188.46	176	175						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0176	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
308	ef09b2e9-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-17	07:29	2019706	NLEG16	81.3822	31.2898	186.42	177							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0177	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
309	ef09b2ea-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-17	08:15	2019706	NLEG17	81.4110	31.2455	205.56	178							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0178	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
310	ef09b2eb-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-17	09:13	2019706	NLEG18	81.4310	31.1448	256.17	179							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0179	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
311	ef09b2ec-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-17	10:04	2019706	NLEG19	81.4593	31.0778	496.41	180	500						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0180	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
313	ef09b2ee-b5ec-11e9-acd1-a0481c9e7d26	CTD	2019-08-17	11:52	2019706	NLEG20	81.5025	30.9588	693.98	181							Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0181	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b2f0-b5ec-11e9-acd1-a0481c9e7d26		2019-08-17	16:30	2019706	P6_Ice	81.5327	30.9684	797.07							P6_Ice station, Ice work				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
314	ef09b2ef-b5ec-11e9-acd1-a0481c9e7d26	Active water sampler	2019-08-17	18:17	2019706	P6	81.5297	30.9555	789.23	64						In situ filtration pump	To be included in v5			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
315	ef09b2ed-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-17	23:02	2019706	P6	81.5498	30.9588	865.44	5										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
316	ef09b2c6-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-18	06:33	2019706	P6	81.5495	31.1605	834.68	182	831					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472		Sta0182	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
317	ef09b2c7-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	07:52	2019706	P6	81.5514	31.1684	839.88	83		50	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
318	ef09b2c8-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	08:07	2019706	P6	81.5521	31.1700	841.87	84		50	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
319	ef09b2c9-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	08:20	2019706	P6	81.5528	31.1709	844.43	85		50	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
320	ef09b2ca-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	08:34	2019706	P6	81.5537	31.1716	848.7	86		50	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
321	ef09b2cb-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	08:48	2019706	P6	81.5548	31.1714	853.44	87		50	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
322	ef09b2cc-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-18	09:04	2019706	P6	81.5562	31.1697	860.71	88		600	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
323	ef09b2cd-b5ec-11e9-acd1-a0481c9e7d26	Sediment trap (short term)	2019-08-18	11:30	2019706	P6	81.5705	31.2185	860.71	65				2019-08-18	2019-08-19	Used bottom depth from ID322				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
324	ef09b2f1-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-18	11:49	2019706	P6	81.5720	31.2128	1155.75	183	200						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0183	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
325	ef09b2f2-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-18	12:30	2019706	P6	81.5748	31.2451	1224.91	66										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
326	ef09b2f3-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-18	13:53	2019706	P6	81.5762	31.3259	1026.46	89										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
327	ef09b2f4-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	14:47	2019706	P6	81.5765	31.3874	1036.91	90		1000	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
328	ef09b2f5-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-18	17:47	2019706	P6	81.5638	31.5185	856.29	91		400	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
329	ef09b2f6-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-18	18:33	2019706	P6	81.5612	31.5260	843.73	92		750	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
330	ef09b2f7-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-18	19:32	2019706	P6	81.5595	31.5188	841.06	93		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
331	ef09b2f8-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-18	20:26	2019706	P6	81.5604	31.4993	848.67	94		750	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
332	ef09b2f9-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-18	21:48	2019706	P6	81.5665	31.4724	894.92	95		750	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
333	ef09b2fa-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-18	22:51	2019706	P6	81.5733	31.4686	989.02	96		750	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
334	ef09b2fb-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-19	00:08	2019706	P6	81.5808	31.4872	1111.65	97		650	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
335	ef09b2fd-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-19	01:07	2019706	P6	81.5850	31.5195	1099.78	184	200					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0184	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
336	ef09b2fe-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-19	02:27	2019706	P6	81.5865	31.5707	1099.2	98										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
337	ef09b2ff-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-19	02:47	2019706	P6	81.5862	31.5827	1089.07	99										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
338	ef09b300-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-19	03:56	2019706	P6	81.5842	31.6212	979.27	6										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
339	ef09b301-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-19	09:01	2019706	P6	81.5452	30.8475	856.66	22							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
341	ef09b303-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-19	11:22	2019706	P6	81.5632	30.8870	1036.76	23							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
342	ef09b304-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-19	13:01	2019706	P6	81.5400	30.8759	829.08	24							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
343	ef09b305-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-19	15:02	2019706	P6	81.5346	30.9570	806.3	25							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
344	ef09b306-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-19	16:53	2019706	NLEG22	81.5905	30.7409	1545.57	185						With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0185	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
345	ef09b307-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-19	18:57	2019706	NLEG23	81.6165	30.6529	1950.0	186	1950					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0186	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
346	ef09b308-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-19	22:24	2019706	NLEG24	81.6830	30.5225	2812.6	187						With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0187	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
347	ef09b309-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-20	08:03	2019706	P7	81.9848	29.9870	3272.97	100										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

348	ef09b30a-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-20	08:41	2019706	P7	81.9836	29.9695	3269.47	101										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
349	ef09b30b-b5ec-11e9-acd1-a0481c9e7d26	Active water sampler	2019-08-20	09:25	2019706	P7	81.9827	29.9437	3274.07	68						In situ filtration pump	To be included in v5			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
	ef09b30c-b5ec-11e9-acd1-a0481c9e7d26		2019-08-20	07:30	2019706	P7_Ice	81.9861	29.9975	3272.82							Ice station				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
351	ef09b30d-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-20	12:54	2019706	P7	81.9819	29.7942	3290.87	102		1250	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
352	ef09b30e-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-20	14:58	2019706	P7	81.9811	29.7287	3290.87	103		2000	0			Vertical haul; Bottom depth taken from ID351				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
353	ef09b30f-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-20	18:08	2019706	P7	81.9693	29.6217	3293.25	188	3280					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0188	See data file for instrument serial numbers. Note change og temperature sensor before cast 192.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
354	ef09b310-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-20	23:16	2019706	P7	81.9509	29.3074	3306.9	104		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
355	ef09b311-b5ec-11e9-acd1-a0481c9e7d26	WP2 90 um	2019-08-20	23:39	2019706	P7	81.9500	29.2858	3313.34	105		70	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
356	ef09b312-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-20	23:54	2019706	P7	81.9494	29.2729	3315.21	106		100	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
357	ef09b313-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-21	00:15	2019706	P7	81.9483	29.2548	3317.39	107		100	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
359	ef09b314-b5ec-11e9-acd1-a0481c9e7d26	Sediment trap (short term)	2019-08-21	03:03	2019706	P7	81.9322	29.1573	3312.04	70				2019-08-21	2019-08-22					Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
360	ef09b315-b5ec-11e9-acd1-a0481c9e7d26	MIK-net 1500 um	2019-08-21	03:30	2019706	P7	81.9283	29.1460	3301.77	109		100	0			Vertical haul				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
361	ef09b316-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-21	03:43	2019706	P7	81.9262	29.1396	3299.7	189	3300						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0189	See data file for instrument serial numbers. Note issues with one of the Temp sensors.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
362	ef09b317-b5ec-11e9-acd1-a0481c9e7d26	Phytoplankton net 10 um	2019-08-21	04:28	2019706	P7	81.9184	29.1151	3289.48	110							Nansen Legacy Sampling protocols v4 July 12 2019 9.1 Phytoplankton net-haul sampling; adjusted sampling depth to 100-0m			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
363	ef09b318-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-21	04:56	2019706	P7	81.9133	29.0975	3288.53	111		1000	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
364	ef09b319-b5ec-11e9-acd1-a0481c9e7d26	Multinet 180 um	2019-08-21	06:34	2019706	P7	81.8948	29.0291	3254.08	112		1000	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
365	ef09b31a-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-21	07:49	2019706	P7	81.8826	28.9682	3233.46	113		1000	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
366	ef09b31b-b5ec-11e9-acd1-a0481c9e7d26	Multinet 64 um	2019-08-21	09:52	2019706	P7	81.8654	28.8577	3136.7	114		300	0							Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
368	ef09b31d-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-21	11:11	2019706	P7	81.8576	28.8065	3120.7	190	3120					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0190	See data file for instrument serial numbers. Note issues with one of the Temp sensors.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
369	ef09b31e-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 180 um	2019-08-21	11:51	2019706	P7	81.8542	28.7927	3116.7	115										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
370	ef09b31f-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-21	13:06	2019706	P7	81.8462	28.7856	3068.87	116										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
371	ef09b320-b5ec-11e9-acd1-a0481c9e7d26	Bongonet 64 um	2019-08-21	14:40	2019706	P7	81.8291	28.8017	2993.82	117										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
372	ef09b321-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-21	17:33	2019706	P7	81.7882	28.7840	2897.95	191	2830						Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0191	See data file for instrument serial numbers. Note issues with one of the Temp sensors.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
373	ef09b322-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-21	19:55	2019706	P7	81.7591	28.7037	2767.68	7										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
374	ef09b323-b5ec-11e9-acd1-a0481c9e7d26	GO-FLO	2019-08-22	00:48	2019706	P7	81.7371	28.6367	2725.78	72										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
375	ef09b324-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-22	02:12	2019706	P7	81.7276	28.6712	2648.91	26							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
376	ef09b325-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-22	08:34	2019706	P7	81.6707	28.7890	2349.31	27							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
378	ef09b327-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-22	12:49	2019706	P7	81.6683	28.8118	2329.02	28							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
379	ef09b328-b5ec-11e9-acd1-a0481c9e7d26	TS probe	2019-08-23	01:07	2019706	SICE4	81.9809	24.2938	3603.33	8										Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
380	ef09b329-b5ec-11e9-acd1-a0481c9e7d26		2019-08-23	08:10	2019706	SICE4	81.9784	24.4732	3599.76	74						Ice work (coring, under-ice sampling etc)				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
381	ef09b32a-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-23	10:18	2019706	SICE4	81.9851	24.5301	3603.75	29							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
384	ef09b32d-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-23	16:55	2019706	SICE4	81.9888	24.7358	3603.75	31						bottom depth taken from ID381	Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
385	ef09b331-b5ec-11e9-acd1-a0481c9e7d26	Box core	2019-08-23	20:12	2019706	SICE4	81.9858	24.8045	3604.08	32							Nansen Legacy Sampling Protocols v4 July 12 2019; 10.2.2 Box corer			Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
386	ef09b332-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-24	03:02	2019706	SICE4	81.9957	24.9952	3657.19	192	3195					With LADCP; Model WHS300-I-UG502; SN 24474 & SN 24472	Nansen Legacy Sampling Protocols v4 July 12 2019; 6.2 CTD; One salinity sample	Sta0192	See data file for instrument serial numbers. Note Temp sensor changed.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
387	ef09b350-b5ec-11e9-acd1-a0481c9e7d26		2019-08-25	11:30	2019706	NW of Spitsbergen	80.3806	12.1674	NaN	76						Multibeam Survey EM302 line 18-20				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
388	ef09b351-b5ec-11e9-acd1-a0481c9e7d26	CTD w/bottles	2019-08-25	13:52	2019706	NW of Spitsbergen	80.5890	12.0545	19.57	193						LYDPROFIL		Sta0193	See data file for instrument serial numbers. Note Temp sensor changed.	Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway
389	ef09b352-b5ec-11e9-acd1-a0481c9e7d26		2019-08-25	14:45	2019706	NW of Spitsbergen	80.5944	12.0526	NaN	77						Multibeam Survey EM302 line 22-40				Tove M. Gabrielsen	Marit Reigstad	marit.reigstad@uit.no	UiT The Arctic University of Norway

The Nansen Legacy in numbers

6 years

The Nansen Legacy is a six-year project, running from 2018 to 2023.

1 400 000 km² of sea

The Nansen Legacy investigates the physical and biological environment of the northern Barents Sea and adjacent Arctic Ocean.

>10 fields

The Nansen Legacy includes scientists from the fields of biology, chemistry, climate research, ecosystem modelling, ecotoxicology, geology, ice physics, meteorology, observational technology, and physical oceanography.

>350 days at sea

The Nansen Legacy will conduct 15 scientific cruises and spend more than 350 days in the northern Barents Sea and adjacent Arctic Ocean between 2018 and 2022. Most of these cruises are conducted on the new Norwegian research icebreaker RV *Kronprins Haakon*.

280 people

There are about 230 researchers working with the Nansen Legacy, of which 73 are early career scientists. In addition, 50 persons are involved as technicians, project coordinators, communication advisers and board members.

10 institutions

The Nansen Legacy unites the complimentary scientific expertise of ten Norwegian institutions dedicated to Arctic research.

Norwegian Meteorological Institute

UNIS
The University Centre in Svalbard

NERSC

NTNU

Akvaplan niva

50/50 financing

The Nansen Legacy has a total budget of 740 million NOK. Half the budget comes from the consortiums' own funding, while the other half is provided by the Research Council of Norway and the Ministry of Education and Research.

Norwegian Ministry of Education and Research

With funding from The Research Council of Norway

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nansenlegacy@uit.no

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