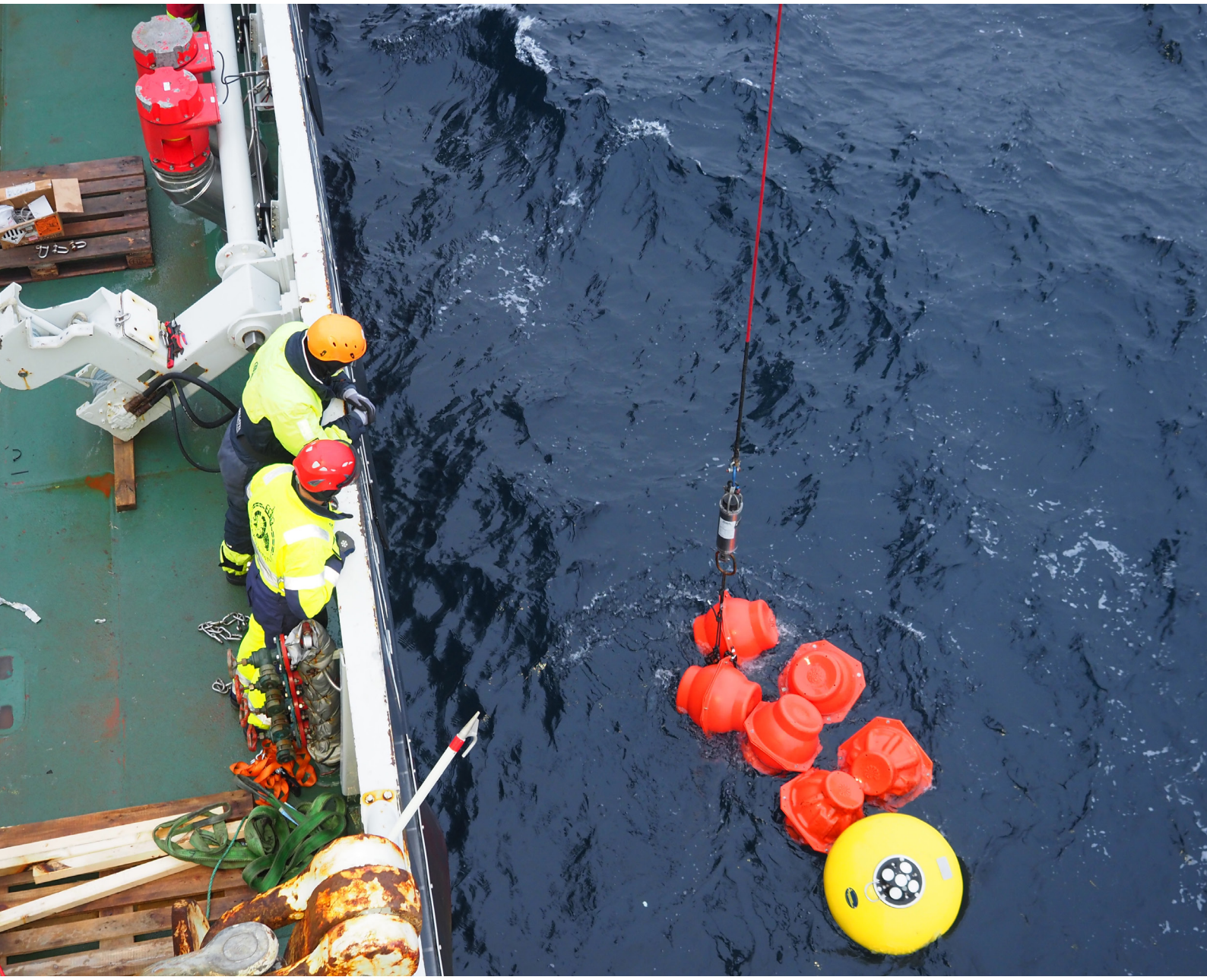
the Nansen LEGACY

Mooring Service Cruise (MSC) 2022

Cruise Report



The Nansen Legacy Report Series 38/2023

Mooring Service Cruise (MSC) 2022: Cruise report

Cruise 2022712

R/V Kronprins Haakon
Longyeabyen-Longyearbyen
2 October – 11 October 2022

Authors:
Øyvind Lundesgaard[1], Arild Sundfjord[1], Julie Sortland[2,3]

1: Norwegian Polar Institute, Tromsø Norway (NPI)
2: UiT The Arctic University of Norway, Tromsø, Norway (UiT)
3: Institute of Marine Research, Norway (IMR)

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1. Objectives and quick cruise summary

The main objective of the cruise was to retrieve and deploy ocean moorings in the north-western Barents Sea and on the continental slope north of Kvitøya for the *Nansen Legacy* and *A-TWAIN* projects. A secondary objective was to perform hydrographic surveys in regions of Atlantic Water inflow and other regions of interest. In addition, the cruise aided other research groups by deployment and recovery of minor equipment at sites along the cruise trajectory.

In general, mooring operations were conducted during day hours, while nights were used to collect CTD data along various transects. Mooring work was completed quickly, efficiently, and ahead of schedule. This left ample time for additional pre-planned hydrographic surveys after the mooring work was complete.

The cruise departed from Longyearbyen in the afternoon on 02.10.2022. An IMR ARGO float was deployed north of Spitsbergen the day after. On the following day, the ship operated for three days in the area around the A-TWAIN mooring array on the continental slope north of Kvitøya. Here, four moorings were recovered, and four were deployed, and hydrographic transects (CTDs) were conducted across the Atlantic Water inflow current and across northern Kvitøya Trough.

After transiting south from the A-TWAIN area on the evening of 06.10.2022, another transect was conducted at night across the southern outlet of Kvitøya Trough. Mooring work began the following morning at the Nansen Legacy M1 location in the north-western Barents Sea. Two moorings were recovered and redeployed. Afterwards, a cross-slope transect was conducted intersecting the M1 mooring location. In the following days, consecutive transects were conducted into the through extending from M1 to Hartogbukta, along the Storisstraumen glacier front, from Storisstraumen southeast across the ocean basin, and along the bathymetric saddle west of Kong Karls Land.

During the transit back north and west, an additional brief transect was conducted outward from Wahlenbergfjorden into the Hinlopen Trough, to obtain data from a fjord with tidewater glaciers that are likely not influenced by Atlantic Water. On 10.10.2022 an NPI radio transmitter was retrieved from the island of Moffen by small boat. The ship then transited back to Longyearbyen, arriving in port on the evening of 11.10.2022.

Overall, the cruise was highly successful. All planned operations were completed in good time, allowing room for extensive hydrographic surveying as well as two minor deployment and recovery operations for other research groups. The success was in part due to fair weather during the first five days of the cruise and completely sea ice-free seas throughout. This allowed mooring work to take place in favourable conditions in an area where operations are often hampered by wind, swell, and sea ice. However, we would also like to highlight the competence and professionalism of the crew of the Kronprins Haakon as a key factor in the success of the cruise. Cooperation and communication with crewmembers on deck and on the bridge were excellent throughout. In addition, the cruise participants efficiently completed all the planned objectives despite the small size of the team (7 team members).

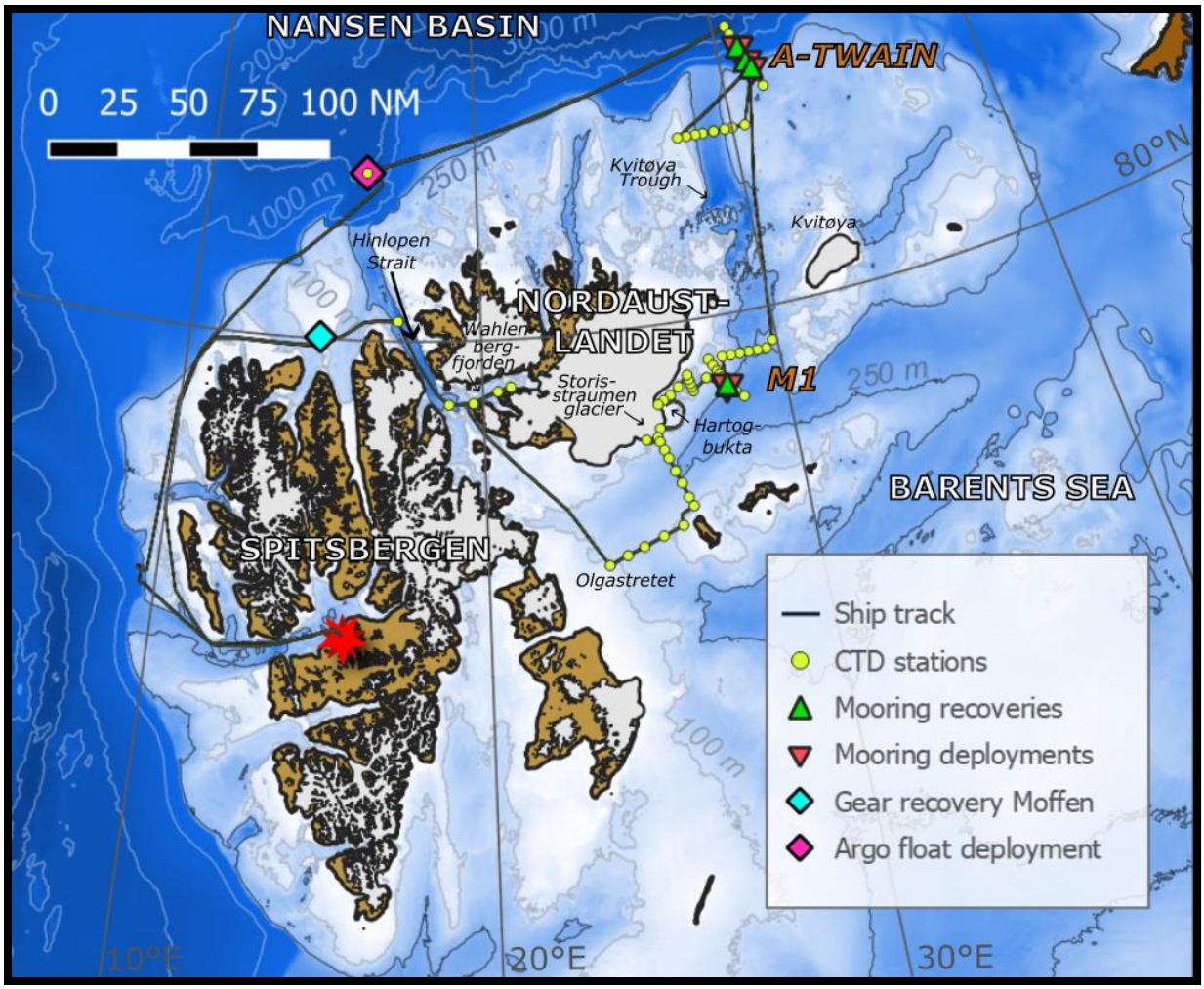

Figure 1: Map of cruise track with stations and operations.

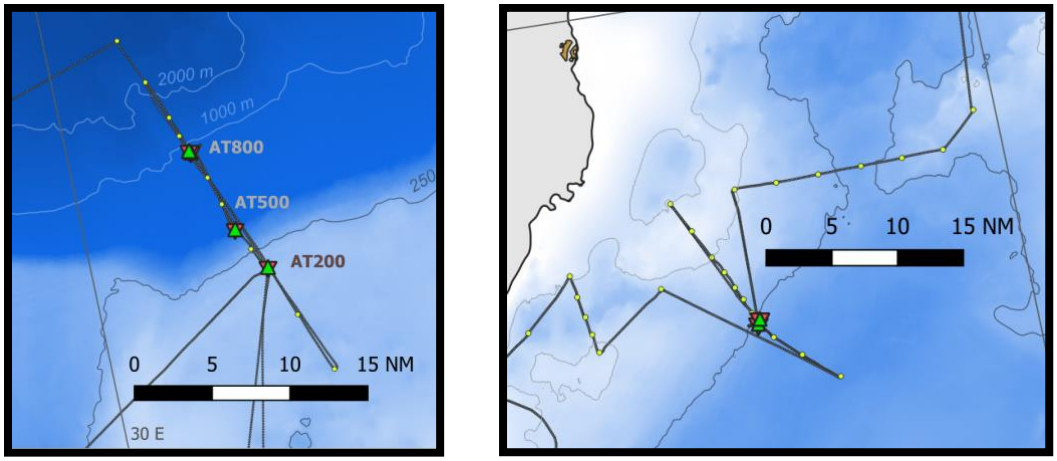

Figure 2&2: Zoomed in maps of the A-TWAIN (left) and M1 (right) areas.

1.1. Study area and conditions during the cruise

The cruise began and ended in port in Longyearbyen, Svalbard. The cruise trajectory (Figure 1) went west and north of Spitsbergen to the A-TWAIN array on the continental slope of the Nansen Basin. From there, it followed a clockwise trajectory around Nordaustlandet, with mooring work

in the northwestern Barents Sea as well as hydrographic transects along the way. The return journey from the northern Barents Sea went through Hinlopen Strait before transiting back to port north and west of Spitsbergen.

Ocean and ice temperatures were both relatively high for the season during the cruise (Figure 3). Ocean temperatures measured at the water intake were around 2-3 C during most of the work, with slightly higher temperatures in the northwestern Barents Sea than in the A-TWAIN area (Figure 4). Air temperatures were above freezing except in a few instances north of Svalbard. Winds were occasionally strong, in particular during the passage of a pressure system starting around 07.10, but did not significantly impede operations.

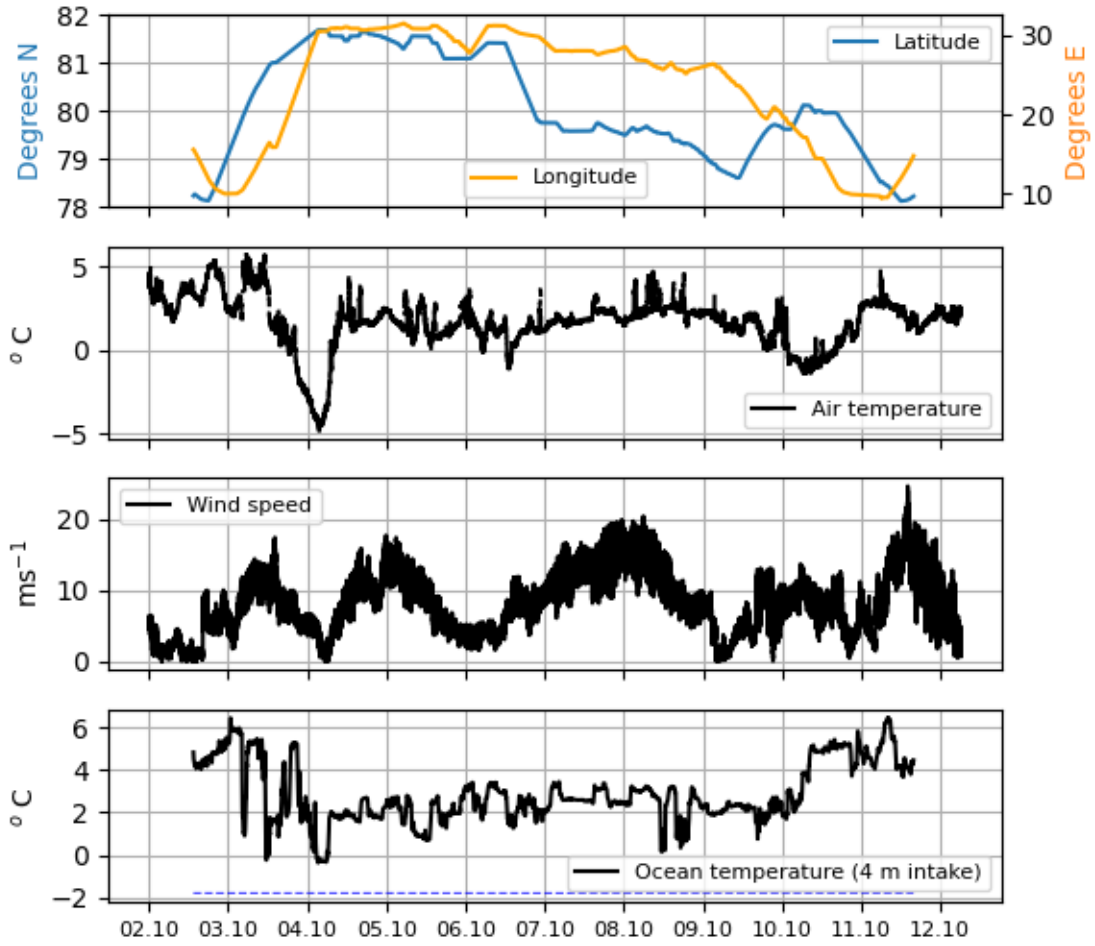

Figure 3: Conditions during the cruise. From top (1) to bottom (4). 1: Longitude/latitude. 2: Air temperature measured by onboard weather station. 3: Wind speed measured by onboard weather station. 4: Ocean tempeature measured at ship water intake (blue dashed line shows -1.8C). X-label dates are 00:00 UTC.

The sea ice edge was located in the Nansen Basin, ~250 km north of Svalbard, during the cruise (Figure 5), and the ship encountered no sea ice in open waters. Large surface sediment plumes were observed at several locations along the front of Storisstraumen glacier.

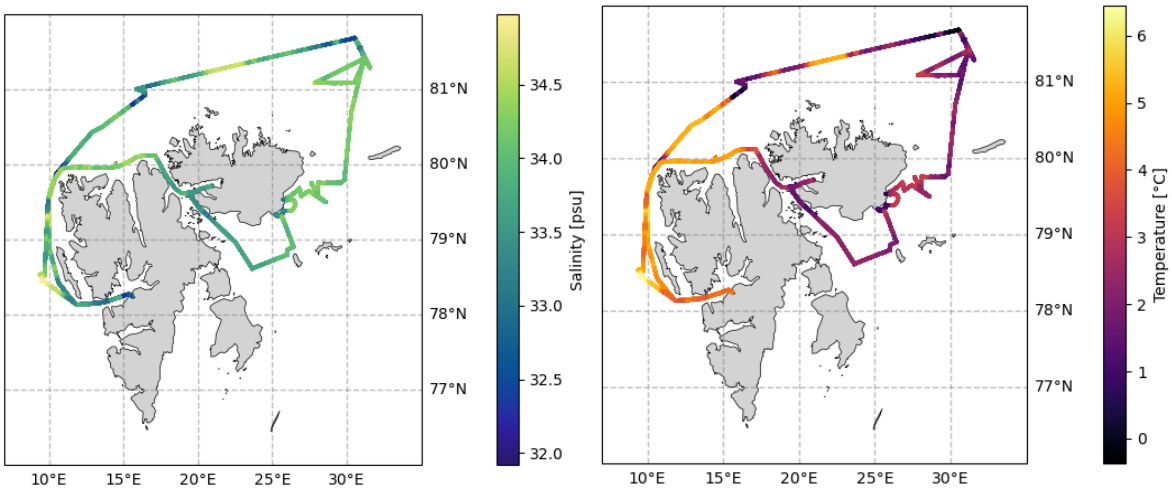

Figure 4: Near-surface salinity (left) and temperature (right) along the cruise track. Data from thermosalinograph, water intake at 4 m depth.

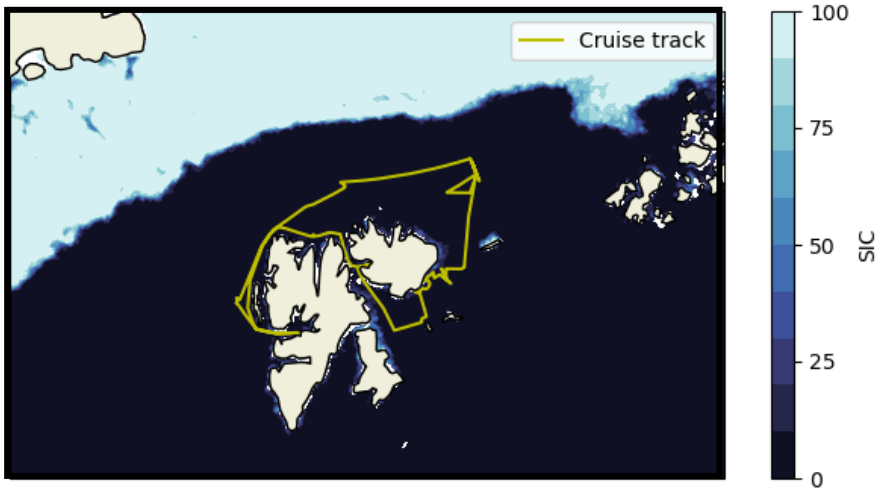

Figure 5: Sea ice concentration on 12.10.22 from AMSR-2 ASI N6250 (https://data.seaice.uni-bremen.de/).

2. Activity reports

2.1. Mooring operations

Two moorings were recovered and redeployed for the Nansen Legacy project. The NPI mooring M1-4 was recovered and its replacement M1-5 was deployed at the same site. The IMR mooring M1-Bioac-2 was similarly replaced by M1-Bioac-3.

Four moorings were recovered and four deployed for the Fram Centre A-TWAIN/SIOS-Infranor. The two NPI moorings AT800 and AT200 were both recovered and redeployed. The NPI bottom mooring lander AT500 was recovered but not redeployed. The IMR mooring AT800-BioAC was recovered. The IMR moorings AT800-BioAC-300 and AT800-BioAC-600 were deployed.

An upward looking Nortek Signature250 ADCP recovered from AT800-7 had an incomplete data record, and there were issues communicating with the instrument. This instrument was therefore

not redeployed on the replacement mooring AT800-8. Otherwise, all moorings were equipped according to plan.

Moorings were deployed anchor first. Both deployment and recovery were done over the starboard side of the ship. The ship's small boat was used to recover the AT500 bottom lander mooring.

An overview of recovered and deployed moorings is found in Table 1 and Table 2. Mooring diagrams showing the nominal depths and serial numbers of instruments on all recovered moorings are found in Appendices Appendix F and Appendix G.

*Table 1: Overview of moorings **recovered** during the MSC2022 cruise. Date/time in UTC. BGC: Biogeochemical, OA: Ocean Acoustics. Exact positions and depths taken from deployment during the MSC2021 cruise report. The #CTD column shows the CTD station number of profiles collected at the mooring site before recovery.*

Mooring	Date	Time (on deck)	Latitude	Longitude	Depth (m)	#CTD	Details
AT800-7	04.10.22	08:23	81N 33.006 81.5501	30E 52.662 30.8777	889	224	ADCPs, CTDs, sea ice, BGC & OA sensors
AT800-BioAc-2	04.10.22	10:38	81N 32.892 81.5482	30E 53.358 30.8893	872	224	Sig100 ADCP (~395 m depth)
AT500-2	04.10.22	12:15	81N 27.462 81.4577	31E 05.418 31.0753	488	231	Bottom lander; ADCP, CTD
AT200-6	06.10.22	08:30	81N 24.630 81.4105	31E 14.598 31.2433	205	236	ADCPs, CTDs, sea ice
M1-BioAC-2	07.10.22	07:05	79N 35.328 79.5888	28E 05.274 28.0879	259	255	Sig100 ADCP (~10m above bottom)
M1-4	07.10.22	07:53	79N 34.974 79.5829	28E 04,302 28.0717	263	255	ADCPs, CTDs, BGC, OA, sea ice

*Table 2: Overview of moorings **deployed** during the MSC2022 cruise. Date/time in UTC. The #CTD column shows the CTD station number of profiles collected at the mooring site after deployment.*

Mooring	Date	Time (released)	Latitude	Longitude	Depth (m)	#CTD	Details
AT800-BioAc-300	04.10.22	15:18	81N 32.878 81.54797	30E 53.398 30.88997	867	237	Sig100 ADCP (~300 m depth)
AT800-8	05.10.22	10:23	81N 32.995 81.54992	30E 51.660 30.86101	895	237	ADCPs, CTDs, BGC sensors
AT800-BioAc-600	05.10.22	11:51	81N 32.761	30E 50.067 31.83445	872	237	Sig100 ADCP (~600 m depth)

			81.54602				
AT200-7	06.10.22	11:31	81N 24.635 81.41059	31E 14.519 31.24199	203*	247	ADCPs, CTDs, sea ice
M1-5	07.10.22	13:29	79N 34.914 79.58190	28E 05.194 28.08656	268	264	ADCPs, CTDs, BGC, sea ice
M1-BioAC-3	07.10.22	14:11	79N 35.340 79.58900	28E 05.319 28.08871	261	264	Sig100 ADCP (~10m above bottom)

**206 m on echo sounder, estimated 203 m on the aft deck where the mooring was deployed.*

2.1.1. Note about the AT800-8 mooring

The top of this mooring was too shallow when deployment was nearly complete, presumably due to wrong length Kevlar lines. Instruments attached to top 150 m were taken off, the line length was adjusted, and the top 150 m was again lowered and instruments attached. Instruments above the middle buoy were measured from the top buoy, and are assumed to be correctly positioned relative to each other. Instruments below the middle buoy were positioned relative to the anchor, and are also assumed to be positioned correctly relative to other instruments in this range. However, there is some uncertainty in the positions of the top instruments relative to the bottom ones. This should be possible to resolve from the pressure records from RBR Concertos when they are recovered.

2.2. Shipboard CTDs

A total of 77 shipboard profiles were conducted during the cruise (Appendix B). The main steel cable usually used on the rosette was not available, and the main CTD rosette could therefore only be deployed with a more sensitive neutrally buoyant kevlar cable. As a result, the main CTD rosette could only be deployed through the ship's moon pool, resulting in meaningful profiles only below the depth of the ship's hull. The CTD was also only lowered at a speed of 0.7 m/s due to the use of the Kevlar cable.

Profiles from the CTD transmissometer exhibited frequent drops to zero within otherwise sensible data. This indicates an issue with the electronic transmission rather than with the instrument itself. The connector cables were gone over, but the issue seems to have persisted throughout the cruise. The remaining data from this instrument appears to be of good quality. Before scientific use of the data, bin average profiles should be recalculated from the full-resolution data after bad scans have been removed.

The CTD was controlled by IMR instrument engineers using SBE Seasave software. GPS data from the ship's navigation system were logged with every scan. CTD unit on the rosette was a SBE911plus. Serial numbers and calibration dates of individual sensors/components are shown in Table 3:

Table 3: Overview of sensors on the CTD rosette.

Sensor	Serial number	Calibration date
SBE 3P Temperature (primary)	6498	21-Jan-22
SBE 4C Conductivity (primary)	4726	25-Jan-22
SBE 5T submersible pump (primary)	9378	-
Digiquartz Temperature Compensated Pressure (primary)	141612	19-Dec-17
SBE 3P Temperature (secondary)	5458	26-Jan-22
SBE 4C Conductivity (secondary)	4221	25-Jan-22
SBE 5T submersible pump	9379	-
SBE 43 Oxygen sensor	3937	10-Mar-22
Benthos Altimeter	73084	24-Dec-17
WET Labs ECO-AFL/FL Fluorometer	FLRTD-6506	18-Sep-20
WET Labs C-Star Transmissometer	CST-2003DR	01-Oct-19
WET Labs CDOM Fluorometer	FLCDRTD-4885	11-Jul-22
Biospherical/Licor PAR/Irradiance sensor	70736	29-Oct-18

The CTD feed also contains measurements from a SPAR sensor (Biospherical/Licor) mounted on the ship (20568, calibrated 27-Nov-2017). Data from this instrument were not assessed during the cruise, but were reported as being unstable or absent.

Two 300 kHz RDI ADCPs were mounted on the rosette in Lowered ADCP (LADCP) mode, one looking up and one looking down. The two instruments sampled coherently in master/slave mode. LADCP data were downloaded between casts.

At each cast, the CTD rosette was lowered to 20 m. After the instrument feeds stabilised, the rosette was raised to 10 m before being lowered to the desired depth (~10 m above bottom with the exception casts #222 and #241). The CTD was lowered at 0.5 m/s above 100 m depth, and at 0.7 m/s below. Water samples for salinity calibration were taken from maximum depth by instrument engineers at each cast, to be sent to IMR for salinity calibration corrections for post-processing of the CTD profiles. Water samples for nutrients were taken on 4 stations (Section 2.3, Appendices Appendix B and Appendix C).

On stations #222 and #276 - #297, a small, internally recording CTD unit was used to supplement the main rosette with data from the upper 20 m. The unit measured temperature, salinity and pressure, and was lowered to >40 m depth before the cast with the main rosette. The unit (SAIV MINI STD/CTD, S/N 882) was most recently calibrated on 04.07.2010, so great care should be taken when interpreting profiles from this sensor.

2.2.1. CTD transects

In addition to CTD stations taken for mooring calibrations, hydrographic surveys were performed along set transects (Figure 6: Locations of hydrographic transects around Nordaustlandet (left) and near the continental slope (right). Transects indicated in orange, with CTD stations shown as yellow dots and ship track shown as gray line.). The CTD stations associated with each transect are shown in Table 4.

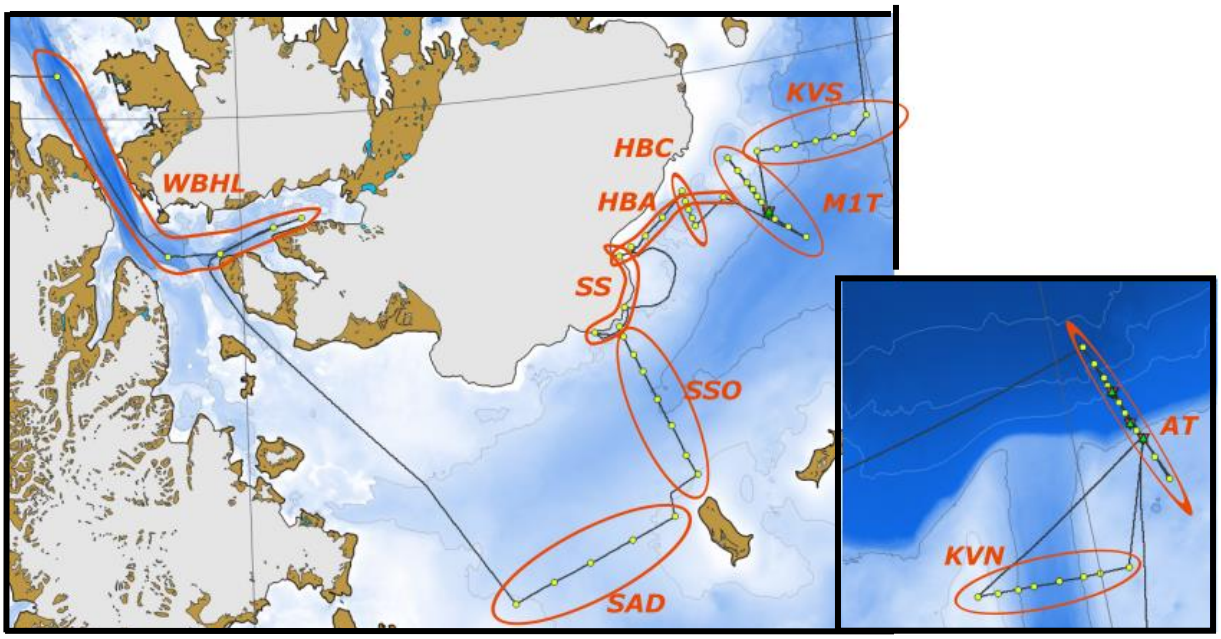

Figure 6: Locations of hydrographic transects around Nordaustlandet (left) and near the continental slope (right). Transects indicated in orange, with CTD stations shown as yellow dots and ship track shown as gray line.

Table 4: CTD transects showing dates and associated CTD numbers. Note that some stations fall along multiple transects (addtional stations from other transects are indicated in parentheses).

Transect	Date	Nr of stations	CTD stations
A-TWAIN cross-slope (AT)	04-05.10	12	223, 225-235
Kvitøyrenna north (KVN)	05-06.10	8	238-240, 242-246
Kvitøyrenna south (KVS)	06-07.10	7	248-254
M1 cross-slope (M1T)	07-08.10	11	257-267
Hartogbukta cross-canyon (HBC)	08.10	4 (5)	269-271, (272), 273
Hartogbukta along-canyon (HBA)	08.10	5 (6)	268, 272, 274-276 (277)
Storisstraumen along-front (SS)	08.10	4	277-280
Storisstraumen offshore (SSO)	08-09.10	7 (8)	(279), 281-287
Olgastretet saddle (SAD)	09.10	5	288-292
Wahlenbergfjorden-Hinlopen (WBHL)	09-10.10	5	293-297

2.3. Nutrient sampling

At total of 40 nutrient water samples for were collected at four stations: at AT800, AT200, M1, and in front of the Storisstraumen glacier terminus. Samples were collected in accordance with the Nansen Legacy Sampling Protocols v10 and using Falcon 50 ml tubes. Water was collected from CTD bottles set to close at fixed depths, as well as 10 m above bottom. In addition, one sample per station was collected from the ship intake.

The water samples will be analysed for nitrate + nitrite (NO_3+NO_2), phosphate (PO_4) and silicate (SiO_4). A detailed overview of the nutrient samples can be found in Appendix C.

2.4. Underway thermosalinograph and PCO2

Measurements from the seawater intake at 4 m depth were collected throughout the cruise since no sea ice was encountered. Close to the water intake, a SBE38 temperature sensor recorded the temperature in order to obtain temperature measurements before the water is heated up as it travels along the piping. In the Clean Seawater Lab, a SBE21 SeaCAT thermosalinograph monitored temperature, salinity, and fluorescence (WET Labs WET star fluorometer).

Instrumentation for measurements of CO_2, pCO_2, (General Oceanics), dissolved oxygen (DO) (Aanderaa sensor), salinity, temperature, CDOM and chlorophyll-a fluorescence was also active during the cruise. These records were not examined specifically but are reported to have functioned well during the cruise.

2.5. Shipboard ADCP

A 150 kHz vessel-mounted ADCPs measured continuously from shortly after leaving port until the end of the cruise. A 38kHz ADCP was used during parts of the cruise where the ship operated in water deeper than 4-500 m. Data acquisition was done using VMDas. Both ADCPs sampled in broadband mode, favouring resolution over range, and both were mounted in the hull (the drop keel mounted instruments were not used). The following, standard configurations were used throughout the cruise:

150kHz ADCP: *CR1 CB611 WP00001 NP00000 WN070 WS0400 WF0600 CX 1,0 BP000 BX08000 ND111100000 TP000100 TE00000200 EZ1020001 EX00000 EA004642 EJ0008 EI-017 ED00084 ES35 CK*
(broadband profiling, single-ping ensembles, 70 bins with 4 m bin depth, 6 m blanking distance, no bottom track, synchronised pinging with K-Sync, transducer misalignment of 46.42 degrees, transducer depth 8.4 m)

38 kHz ADCP: *CR1 CB611 WP00001 NP00000 WN064 WS1600 WF1600 CX 1,0 BP000 BX17000 ND111100000 TP000300 TE00000300 EZ1020001 EX00000 EA004688 EJ-009 EI001 ED00084 ES35 CK*
(broadband profiling, single-ping ensembles, 64 bins with 16 m bin depth, 16 m blanking distance, no bottom track, synchronised pinging with K-Sync, transducer misalignment of 46.88 degrees, transducer depth 8.4 m)

2.6. Weather station

Continuous measurements of air temperature, humidity, wind speed/direction, air pressure, humidity, dew point, seawater temperature at 8.5 m, and solar radiation were collected by a Vaisala AWS430 weather station on the ship.

3. Cruise participants

Table 5: Cruise participants

Name	Institute	Role	E-mail
Øyvind Lundesgaard	NPI	Cruise leader	oyvind.lundesgaard@npolar.no
Arild Sundfjord	NPI	Co-cruise leader; hydrography, moorings	arild.sundfjord@npolar.no
Ceslav Czyz	NPI	Moorings	ceslav.czyz@npolar.no
Harald Dag Jølle	NPI	Historian/outreach	harald.dag.jolle@npolar.no
Terje Hovland	IMR	Moorings	terje.hovland@hi.no
Thomas Haug Johnsen	NPI	Moorings	thomas.haug.johnsen@npolar.no
Julie Sortland	UIT	Hydrography, moorings, water sampling	julie_sortland@outlook.com

Figure 7: Happy cruise participants toward the end of a successful cruise.

Appendix A. Daily cruise summary

Times in UTC

02.10.2022

Left port once the last cruise participants embarked, around 13:00. Safety meeting for all participants in the conference room. Heading north along western Spitsbergen. Fair weather and sea conditions.

03.10.2022

Arrived at the planned site of ARGO deployment and test CTD on the continental slope north of Svalbard. Steamed slightly northwest after getting more information about the desired deployment depth (2000 m) from investigators at IMR. Test CTD to 500 m at 11:40 followed by deployment of ARGO float WMO 4903641 shortly after. Continued eastward toward the A-TWAIN area.

04.10.2022

Arrived at night (01:30) at the northernmost location of the planned A-TWAIN CTD transect near 81N 40. Steaming south to arrive at AT800 mooring site in the morning. Toolbox meeting with ship crew, pinged the mooring and found it on ship echo sounder. Pre-recovery CTD with nutrients at AT800. AT800-7 released at 08:23, full mooring on deck at 09:22. AT800-BioAc-2 released at 09:58, on deck 10:38.

Steamed to AT500 site and released AT500-2 at 11:43. Recovered using small boat, on deck 12:15. Back to AT800 site to deploy AT800-BioAC-300. Deployment start 14:25, released 15:18. Steamed north to continue CTD transect from station AT2.

05.10.2022

Finished last station (AT12) in the early morning. Back to AT200 site to conduct pre-recovery CTD with nutrients. Toolbox meeting and preparations for deployment. AT800-8 deployment start 08:04. Spent some time adjusting the top kevlar length and moving location in order to get the top buoy at the right depth. AT800-8 released 10:23. Deployment of AT800-BioAC-600 start at 11:14. Some position adjustments for depth. AT800-BioAC-600 deployed released 11:53. Post-deployment CTD at AT800.

Steamed to AT200 site for recovery of AT200-7. Began pinging for the mooring around 14:10 but received no return signal. Tried to release the mooring but no floats surfaced. Bottom elements of the moorings were visible on the ship echo sounder. After unsuccessful release of AT200-7: headed west for CTD transect at Kvitøyrenna North (KVN), working westward during the night.

06.10.2022

Finished KVN transect and returned to AT200 site. Toolbox meeting before mooring operations. Tried pinging AT200-7 again, from a slightly different location and with the acoustic transducer closer to the hangar door. The AT200-7 mooring now released at 08:12. AT200-7 on deck 08:43.

Start of AT200-8 deployment 10:52, released 11:31. Depth on echo sounder 206 m, estimating that exact depth of mooring was 203 m. Conducted post-deployment CTD at AT200 site and

steamed south to complete Kvitøyrenna South (KVS) transect overnight. Reached first, eastern, KVS station around 22:00.

07.10.2022

Finished KVS transect and arrived at M1 site in the morning. Pre-recovery CTD with nutrient sampling at M1 at 05:55. Easterly wind picking up but manageable working conditions. Pinged M1-BioAc-2 and released at 06:42. Foggy and poor visibility but found the mooring float after a short time. On deck 07:05. Moving on to M1-4 site, pinged and released M1-4 at 07:16. Some difficulty connecting to the mooring due to swell. Entire M1-4 mooring on deck 08:10. Pause on site to prepare for deployment of the two remaining moorings. Collected one CTD to examine any changes in the mixed layer during wind forcing.

Began deployment of M1-5 around 12:20. Released at 13:29. Began deployment of M1-Bioac-3 shortly after. M1-Bioac-3 released at 14:11.

Steamed north to conduct a cross-slope transect at M1 (M1T). Transect included a post-deployment CTD at the M1 site (CTD #249). Finished last station shortly after midnight UTC.

08.10.2022

Continued doing CTD westward from M1, both along (HBA) and across (HBC) the trench connecting the M1 area and Hartogbukta. SAIV CTD used in the surface waters from HBA-4 onward. Finished the HB transects and arrived at the first station of the Storisstraumen transect (SS) close to Storisstraumen glacier front in Hartogbukta. First station SS-1 at 11:57, also took nutrient samples. Very poor visibility, but calving front is visible in front of the ship. Clear delineation into surface plume water visible both as a color change (blue->brown), on the ice radar (as a line feature at the edge of the surface plume waters) and in the thermosalinograph (as a >2 C drop in temperature and >1 g/kg drop in salinity). Conducted CTD within plume. Due to shoaling waters and unknown bathymetry, the ship went away from the glacier front on the way to the next station. Using Kartverket bathymetry (available slightly further south) and going back toward the glacier front to collect a new CTD, this time in an indent of the Storisstraumen front near the middle of the terminus (station SS-2). Brown, fresh waters were also observed here and on the two subsequent CTDs taken along the glacier front.

Moved on to a new CTD transect (SSO) extending outward from SS-2, across the basin toward Svenskøya. First station 19:59.

09.10.2022

Finished the SSO transect around 03:30, went on to a new transect (SAD) westward across the saddle toward to Olga Basin. Finished after 11:00 and steamed north into Hinlopen Strait.

At this point, we were considering whether it was feasible to pick up radiosondes on Lågøya and Moffen for NPI colleagues working on walrus tracking. Given a weather forecast of strong NE winds in the morning and a ~4 h transect time between the two locations, we decided not to go to Lågøya, but instead to arrive at Moffen around noon and assess the conditions, resulting in some extra time being available during transit.

10.10.2022

The extra time during transit through Hinlopen was used to collect 4 CTDs from the middle of Wahlenbergfjorden and outward into Hinlopen (WBHL). In addition, a final CTD (#297) was collected in the northern mouth of Hinlopen around 06:50. This location fit well as the outermost station of the WBHL transect, but also constitutes a repeat of a station occupied by Fridtjof Nansen in 1912 (10.10 also happens to be Nansen's birthday).

Steamed north and west toward Moffen island. The swell and winds had abated considerably, and visibility was fair. The conditions were deemed safe for going ashore. After a safety meeting at 10:30, a light boat with 4 cruise participants and 3 crew members set out to Moffen at 11:00. The team included two polar bear guards, and the operations were monitored from the KPH bridge. Several walrus were observed on the beach and in the surrounding water; the team maintained distance from the animals, retrieved the radio sender, and was back on ship around 11:50.

Steamed westward toward Longyearbyen ahead of schedule. Going at a moderate speed to maximize fuel economy.

11.10.2022

Steaming toward Longyearbyen. Test trawl for maintenance of equipment west of Forlandet. In port in Longyearbyen around 20:00.

Appendix B. CTD overview

Table 6: Details of CTD casts during the cruise.

CTD #	Date	Time UTC	Lat	Lon	Max depth	SAIV CTD	Transect ID	Comment
222	03.10.22	13:42	80 59.88 N	015 52.99 E	495	Y		Test cast, Nansen Basin N of Hinlopen, ~2 km depth. CTD only to 500. ARGO deployment.
223	04.10.22	03:30	81 40.88 N	030 32.43 E	2819	N	AT1	Northernmost of A-TWAIN line, Nansen Basin
224	04.10.22	07:17	81 33.10 N	030 55.34 E	880	N		Before AT800 recovery. **Nutrient sampling.**
225	04.10.22	16:23	81 37.90 N	030 40.64 E	2150	N	AT2	
226	04.10.22	18:47	81 35.36 N	030 47.40 E	1597	N	AT3	
227	04.10.22	20:29	81 34.07 N	030 49.98 E	1114	N	AT4	
228	04.10.22	21:52	81 33.01 N	030 52.63 E	882	N	AT5	
229	04.10.22	23:06	81 31.07 N	030 57.88 E	740	N	AT6	
230	05.10.22	00:14	81 29.21 N	031 01.32 E	627	N	AT7	
231	05.10.22	01:15	81 27.47 N	031 04.53 E	481	N	AT8	Near AT500 mooring
232	05.10.22	02:11	81 25.99 N	031 09.20 E	267	N	AT9	

233	05.10.22	03:06	81 24.60 N	031 14.65 E	194	N	AT10	
234	05.10.22	04:05	81 21.23 N	031 22.27 E	184	N	AT11	
235	05.10.22	05:00	81 17.29 N	031 32.09 E	196	N	AT12	
236	05.10.22	06:25	81 24.61 N	031 14.57 E	193			CTD AT200. **Nutrient sampling.**
237	05.10.22	12:15	81 32.79 N	030 52.02 E	858			CTD after AT800 deployment
238	05.10.22	17:47	81 04.99 N	030 29.97 E	122	N	KVN1	
239	05.10.22	19:00	81 04.99 N	030 00.00 E	122	N	KVN2	
240	05.10.22	19:42	81 04.98 N	029 42.21 E	214	N	KVN3	
241	05.10.22	20:45	81 04.99 N	029 16.08 E	117	N		CTD to calibrate AT800 CTD sensors
242	05.10.22	21:35	81 04.99 N	029 16.08 E	351	N	KVN4	
243	05.10.22	22:40	81 04.99 N	028 49.99 E	345	N	KVN5	
244	05.10.22	23:32	81 04.99 N	028 32.77 E	230	N	KVN6	
245	06.10.22	00:23	81 05.00 N	028 11.98 E	108	N	KVN7	
246	06.10.22	01:11	81 05.00 N	027 51.17 E	70	N	KVN8	
247	06.10.22	11:50	81 24.35 N	031 13.73 E	184	N		CTD after AT200 deployment
248	06.10.22	22:04	79 47.79 N	029 50.84 E	146	N	KVS1	
249	06.10.22	22:56	79 45.30 N	029 34.76 E	186	N	KVS2	
250	06.10.22	23:43	79 45.30 N	029 16.88 E	209	N	KVS3	
251	07.10.22	00:29	79 45.30 N	028 59.09 E	266	N	KVS4	
252	07.10.22	01:20	79 45.29 N	028 40.51 E	214	N	KVS5	
253	07.10.22	02:12	79 45.25 N	028 22.28 E	157	N	KVS6	
254	07.10.22	03:16	79 45.30 N	028 04.28 E	74	N	KVS7	
255	07.10.22	05:55	79 34.94 N	028 03.89 E	252	N		CTD at M1. **Nutrient sampling.**
256	07.10.22	08:58	79 34.97 N	028 04.20 E	252	N		CTD between M1 depl./recovery. After strong wind forcing.
257	07.10.22	16:10	79 45.06 N	027 36.26 E	83	N	M1T-1	
258	07.10.22	17:10	79 42.76 N	027 43.32 E	40	N	M1T-2	
259	07.10.22	17:52	79 40.54 N	027 49.75 E	82	N	M1T-3	
260	07.10.22	18:30	79 39.26 N	027 53.94 E	118	N	M1T-4	
261	07.10.22	19:03	79 37.99 N	027 57.22 E	163	N	M1T-5	

262	07.10.22	19:35	79 37.00 N	027 59.98 E	197	N	M1T-6	
263	07.10.22	20:10	79 35.87 N	028 02.35 E	225	N	M1T-7	
264	07.10.22	20:45	79 35.10 N	028 04.02 E	249	N	M1T-8	CTD after AT200 deployment
265	07.10.22	21:42	79 33.78 N	028 09.68 E	296	N	M1T-9	
266	07.10.22	22:46	79 32.10 N	028 20.13 E	308	N	M1T-10	
267	08.10.22	00:03	79 29.96 N	028 34.23 E	336	N	M1T-11	
268	08.10.22	02:38	79 38.82 N	027 26.46 E	138	N	HBA-1	
269	08.10.22	03:58	79 34.83 N	026 56.61 E	79	N	HBC-1	
270	08.10.22	04:39	79 36.24 N	026 54.80 E	119	N	HBC-2	
271	08.10.22	05:25	79 37.63 N	026 53.11 E	173	N	HBC-3	
272	08.10.22	06:07	79 39.22 N	026 50.95 E	111	N	HBA-2	
273	08.10.22	06:46	79 40.88 N	026 49.23 E	69	N	HBC-3	
274	08.10.22	07:59	79 37.09 N	026 28.30 E	181	N	HBA-3	
275	08.10.22	09:16	79 34.48 N	026 10.36 E	133	N	HBA-4	
276	08.10.22	10:24	79 33.03 N	025 55.92 E	108	Y	HBA-5	
277	08.10.22	11:57	79 31.78 N	025 44.20 E	114	Y	SS-1	**Nutrient sampling**
278	08.10.22	16:25	79 23.23 N	025 42.12 E	83	Y	SS-2	
279	08.10.22	17:39	79 20.20 N	025 35.39 E	95	Y	SS-3	
280	08.10.22	18:49	79 19.75 N	025 12.89 E	65	Y	SS-4	
281	08.10.22	19:59	79 18.49 N	025 38.13 E	103	Y	SSO-1	
282	08.10.22	21:03	79 15.40 N	025 44.57 E	134	Y	SSO-2	
283	08.10.22	22:08	79 12.33 N	025 50.93 E	186	Y	SSO-3	
284	08.10.22	23:28	79 07.45 N	025 59.93 E	229	Y	SSO-4	
285	09.10.22	00:40	79 02.88 N	026 09.10 E	185	Y	SSO-5	
286	09.10.22	01:55	78 57.60 N	026 18.13 E	148	Y	SSO-6	
287	09.10.22	03:13	78 54.26 N	026 25.36 E	73	Y	SSO-7	
288	09.10.22	04:48	78 47.88 N	026 00.98 E	80	Y	SAD-1	
289	09.10.22	06:12	78 45.00 N	025 22.76 E	106	Y	SAD-2	
290	09.10.22	07:35	78 42.05 N	024 44.98 E	132	Y	SAD-3	

291	09.10.22	08:51	78 39.59 N	024 13.20 E	132	Y	SAD-4	
292	09.10.22	10:31	78 36.69 N	023 39.05 E	75	Y	SAD-5	
293	09.10.22	21:41	79 42.91 N	020 56.18 E	96	Y	WBHL-1	
294	09.10.22	22:50	79 41.51 N	020 29.98 E	148	Y	WBHL-2	
295	10.10.22	00:31	79 37.52 N	019 40.13 E	267	Y	WBHL-3	
296	10.10.22	02:11	79 37.22 N	018 51.81 E	314	Y	WBHL-4	
297	10.10.22	06:50	80 07.00 N	017 08.01 E	383	Y	WBHL-5	At site of Nansen 1912 CTD

Appendix C. Nutrient samples

Table 7: Nutrient water samples collected during the cruise.

Station	Date	Source	Bottle no.	Depth [m]	Event ID
AT-800 81,5517N 30,9223E CTD #224	04.10 2022, 07:17	CTD bottles	1	890	b0b40082-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	2	500	b0b40640-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	3	300	b0b40d48-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	4	200	b0b41310-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	5	150	b0b418ba-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	6	120	b0b41e64-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	7	90	b0b42562-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	8	60	b0b42e18-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	9	30	b0b43412-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	10	20	b0b439d0-3fe4-11ed-b665-b827eb22bac7
		Ship intake		4	b0b43f7a-3fe4-11ed-b665-b827eb22bac7
AT-200 81,4102N 31,2428E CTD #236	05.10 2022, 06:25	CTD bottles	1	195	b0b4452e-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	2	150	b0b44ae2-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	3	120	b0b450c8-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	4	90	b0b45690-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	5	60	b0b45c62-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	6	50	b0b46234-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	7	40	b0b467de-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	8	30	b0b46d92-3fe4-11ed-b665-b827eb22bac7

		CTD bottles	9	20	b0b47346-3fe4-11ed-b665-b827eb22bac7
		Ship intake		4	b0b47904-3fe4-11ed-b665-b827eb22bac7
M1 79,5823N 28,0648E CTD #255	07.10, 2022, 05:55	CTD bottles	1	255	b0b47ea4-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	2	200	b0b48444-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	3	150	b0b489ee-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	4	120	b0b48fb6-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	5	90	b0b4956a-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	6	60	f39e715c-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	7	50	f39e7f30-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	8	40	f39e85c0-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	9	30	f39e8b7e-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	10	20	f39e913c-3fe4-11ed-a879-b827eb22bac7
		Ship intake		4	f39e98a8-3fe4-11ed-a879-b827eb22bac7
Storis-straumen glacier front 79,5297N 25,7367E CTD #277	08.10 2022, 11:57	CTD bottles	1	115	f39e9e7a-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	2	90	f39ea424-3fe4-11ed-a879-b827eb22bac7
		CTD bottles	3	60	b0b40082-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	4	50	b0b40640-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	5	40	b0b40d48-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	6	30	b0b41310-3fe4-11ed-b665-b827eb22bac7
		CTD bottles	7	20	b0b418ba-3fe4-11ed-b665-b827eb22bac7
		Ship intake		4	b0b41e64-3fe4-11ed-b665-b827eb22bac7

Appendix D. Outreach

Content from the cruise posted underway through NPI's social media channels.

Historian Harald Dag Jølle joined the cruise as part of the preparation for a book about past and current polar research.

Planned: Short text to be published in appropriate channel (*forskning.no* or similar).

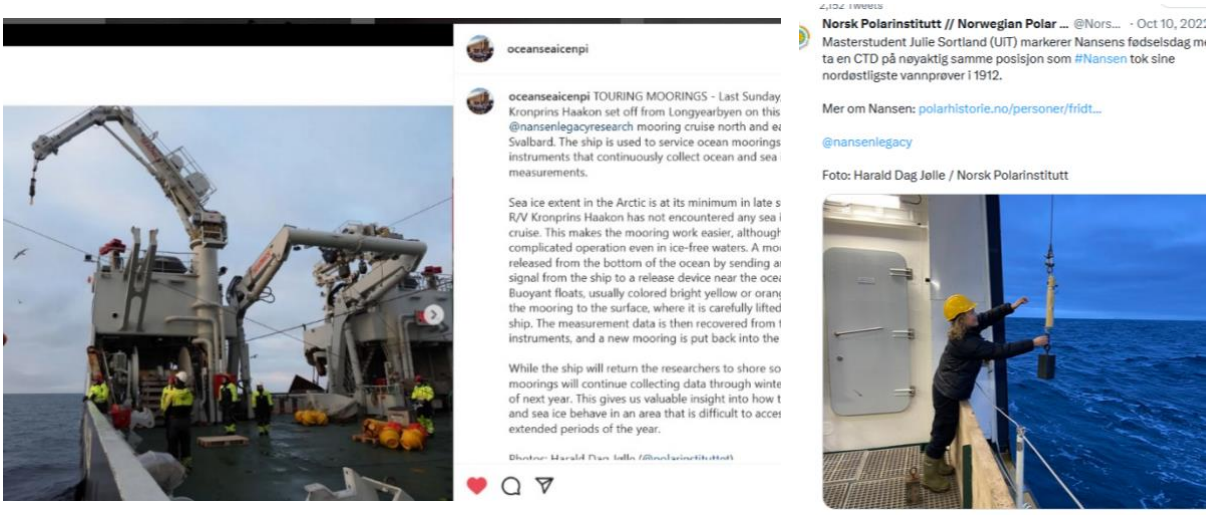

Figure 8: Social media posts published during the cruise.

Appendix E. Planned Nansen Legacy datasets

Table 8: Planned Nansen Legacy datasets. NPDC: Norwegian Polar Data Centre. NMDC: Norwegian Marine Data Centre

PI	Dataset	Planned analysis	RF	Sharing within project	Publishing	Embargo
Sundfjord, Lundesgaard (NPI)	Water column data from M1-4 mooring	2023	RF1	Summer 2023 (raw data available on request)	2023/2024 (NPDC)	N
Sundfjord, Lundesgaard (NPI)	Sea ice data from M1-4 mooring	2023	RF1	Summer 2023	2023 (NPDC)	Y (planned paper)
Chierici (IMR)	CO2/pH/oxygen data from moored sensors on M1-4	Contact PI	RF2	Contact PI	Contact PI	Contact PI
Ingvaldsen (IMR)	Bioacoustics from M1-BioAc-2	Contact PI	RF3	Contact PI	Contact PI	Contact PI
Reigstad (UIT)	Nutrients from water samples	2023	RF2	Contact PI	Contact PI	N
Sundfjord, Lundesgaard (NPI)	CTD data (processing by IMR)	2023 (IMR)	RF1	Raw data available on NIRD	2023 (NMDC)	N

Data collected from the ship (underway TSG and weather, raw CTD and ADCP, navigational data, etc.) are available to NL members on NIRD (*NS9530K/nansen_legacy/raw_data/kph/S2022712_PKRONPRINSHAAKON_9566*).

Appendix F. Diagrams of recovered moorings

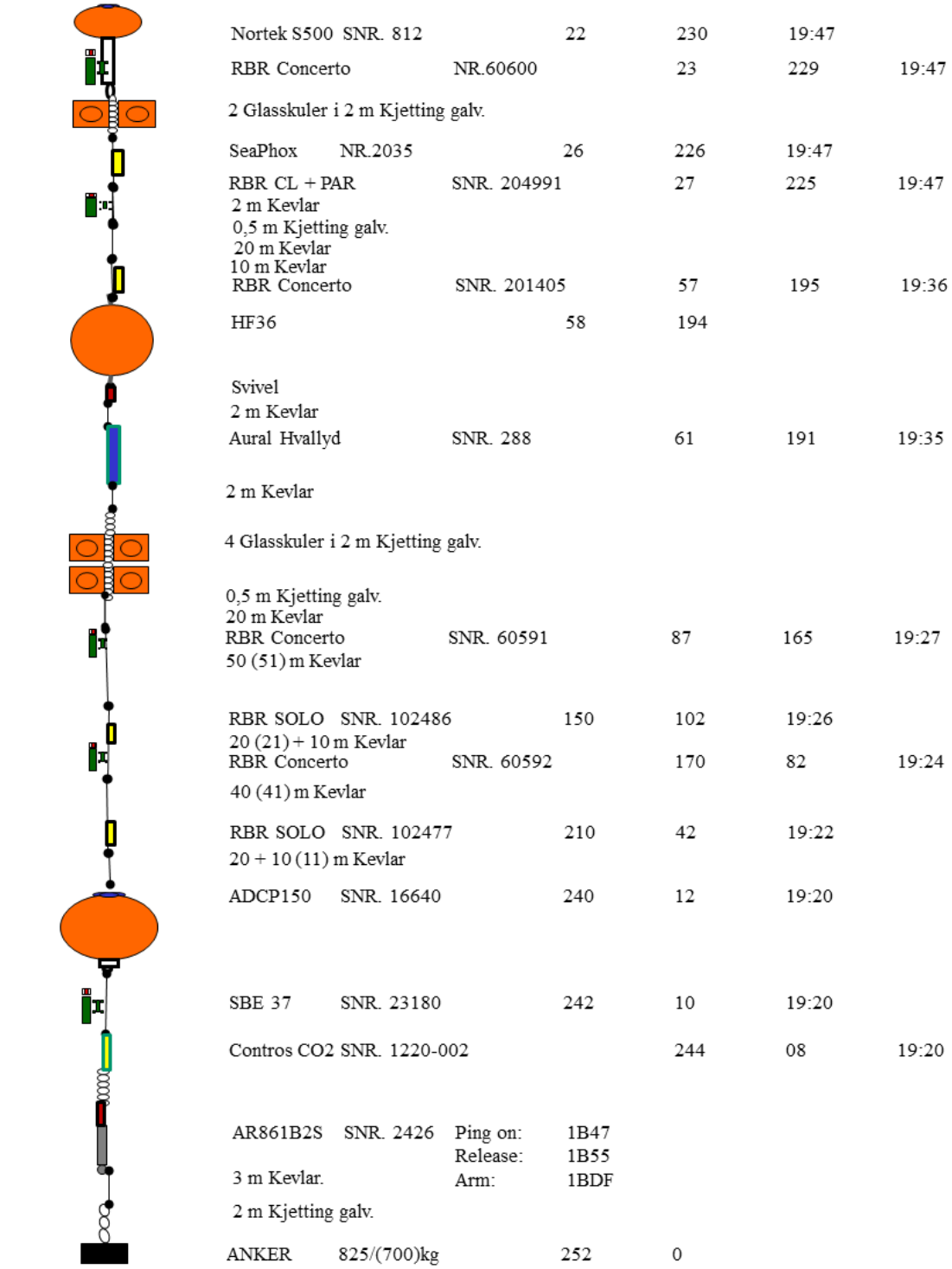

Figure 9: M1-4

Institute of Marine Research
Mooring Instruments

Ship plat orm:	KPH		
Stat on name:	M1-BIOAC		
Lat tude:	N 79° 35.178	Longitude:	E 28° 24.974
Bot om depth [m]	265	Total height [m]	
Outgoing date:	10.11.21	Outgoing t me:	07:40utc
Incoming date:		Incoming t me:	

Argos		S/N:	181
PTTID:	1577	Hex:	
Acoust c Release Ixblue			
Type:	R5	S/N:	21350035
Bat type:	Alk. original	Bat exp:	Approx june2025
Range code:	3524	Release code:	3555

Comments for deployment operat ons:
Start recording 11novkl1800utc
Comments for recovery operat ons:
Bat ery on next release must be changed af er next recovery

Instruments / sensors					
#	Brand	Type	S/N	Depth	Comment
1	Nortek	Signature 100	101764	244	2års utset
2	Novatech	Blinkelys	F10-062	244	New bat
3	SIS	ArgoTx	181	244	New saf LS20
4	t				
5	t				
6	t				
7	t				

Instruments config info					
#	Type/sn	Ping/ Time/cell	Record interval	Bat ery info	Comment
1	Sig100adcp	180s/10m	2t	lithium	2xlithium
2	Sig100echo		20sek		400m range
3	t				
4	t				
5	t				
6	t				

Rigging parts		
#	Type	Qty
1	Shackle galvanized steel	
2	Shackle stainless steel 3.25 T	
3	Kevlar tau	
4	Strope	
5	Ring (plast c/metal)	
6	Strope	
7	Ring (plast c/metal)	

Responsible for deployment or recovery operat ons:

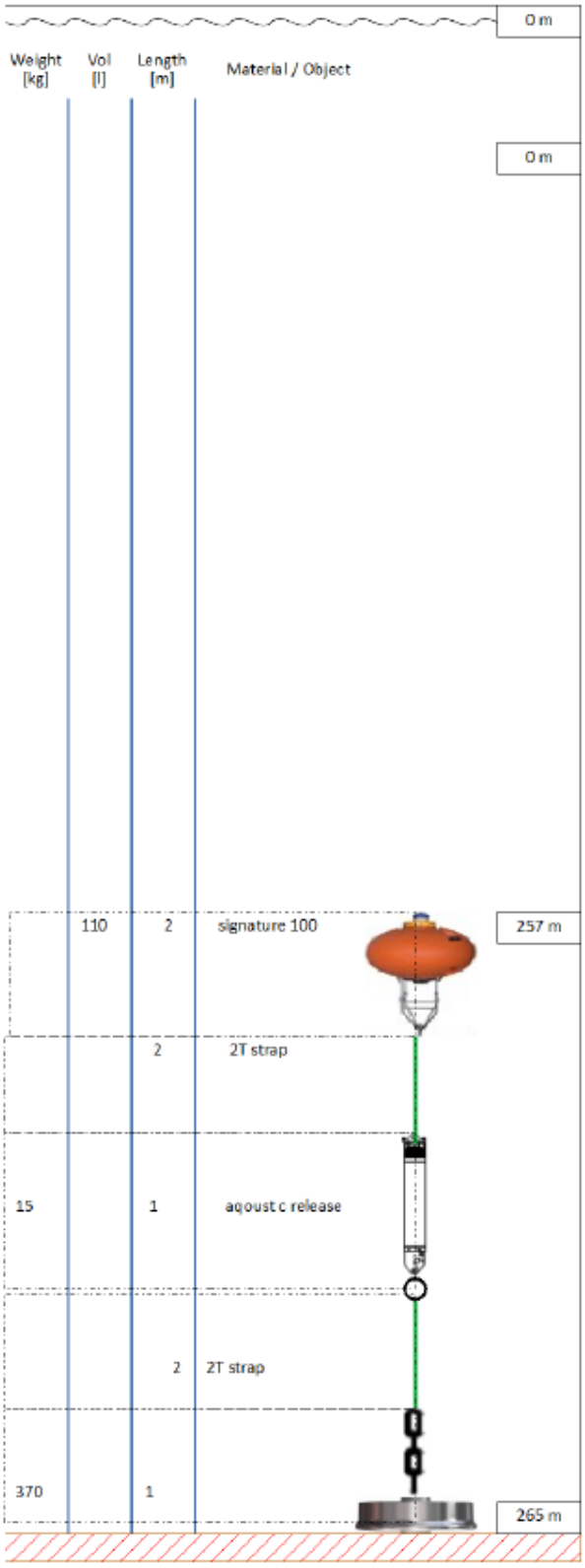

Figure 10: M1-BioAC-2

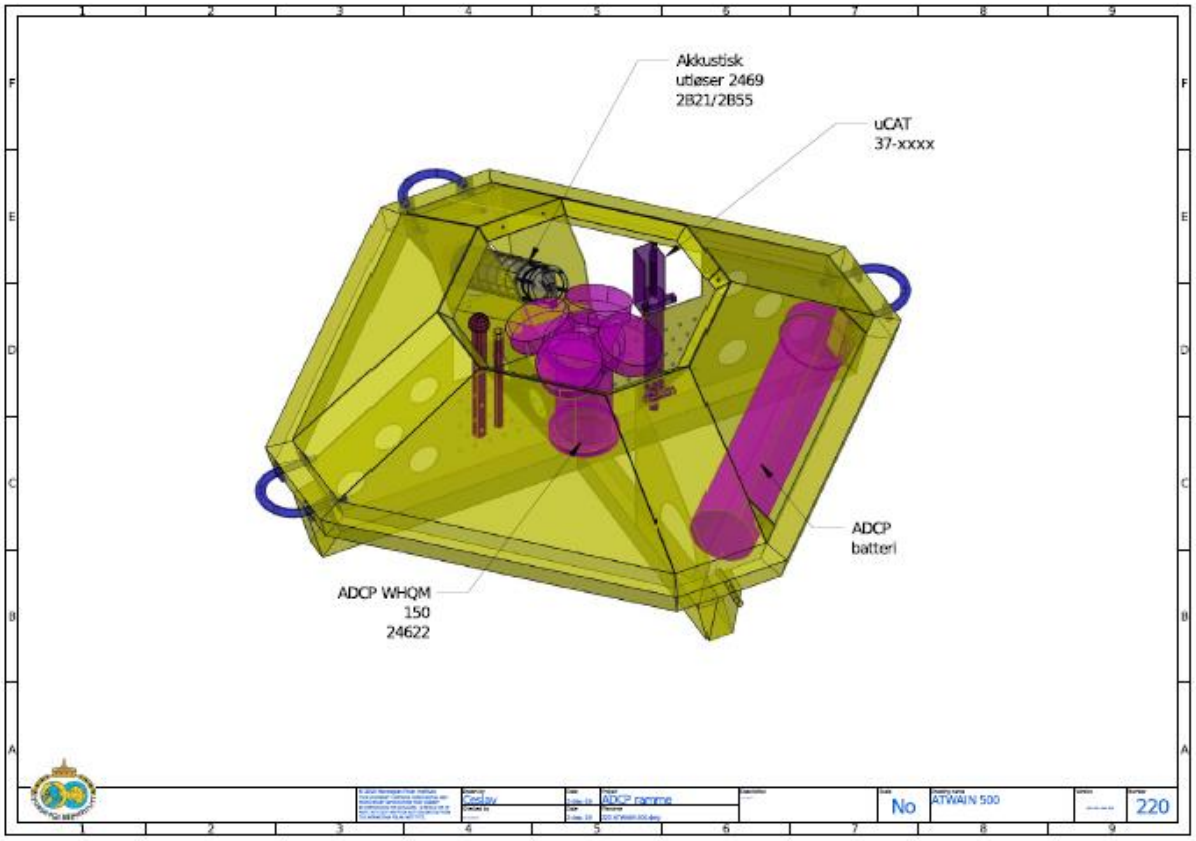

Figure 11: AT500-2

Rigg ATWAIN200-6 81 24.630N(81.4105) Dyp: Over bunn: I vannet:
Ut 09.11.2021, kl 19:39 031 14,598E(31.2433)
Opp .20 kl

ADCP Nortek SNR: 802		40	162	19:38	
6 Glasskuler		41	161		
3 m Kjetting Galv.					
SBE16/ECO SNR. 50241/5803			45	157	19:38
1 m Kjetting galv.					
0,5 m Kjetting galv.					
SBE37 SNR. 20773		49	153	19:38	
10 m Kevlar					
Hvallydopptaker 236			59	143	19:30
2 m Kevlar					
0,5 m Kjetting galv.					
50 m Kevlar					
SBE37 SNR. 15252		113	89	19:30	
20 m Kevlar					
50(51) m Kevlar					
ADCP150 SNR: 24619		185	17	19:20	
5 m Kevlar					
SBE37 SNR. 9293		190	12	19:20	
4 Glasskuler i 2 m galvanisert kjetting					
0,5 m Kjetting syrefast					
Svivel					
AR861CS SNR. 1454	Arm: 09AB				
	Release: Arm + 0955				
3 m Kevlar					
3 m Chain					
ANCHOR 900/(800) kg		202	0		

Figure 12:AT200-6

Rigg ATWAIN800-7 81 33,006N (81.5501) Dyp: Fra bunn: Ned i vann:

Satt ut 9.11.2021 , kl 11:20 030 52,662E(30,8777)

Nortek Sign 250 SNR 100828 13(1) 867 19:20

4 glasskuler

SUNA SNR. 0294 41 839 19:20

RBR Concerto CL+PAR SN. 204992 45 835 19:20
2 m Kevlar

97 783 19:10

0,5 m Kjetting Galv.

50 m Kevlar

4 glasskuler
2 m Kjetting

0,5 m Kjetting Galv.

RBR Concerto SNR. 60595 99 781 19:10

100 m Kevlar

RBR Concerto SNR. 201413 151 729 18:59

RBR Concerto SNR.201414 201 679 18:55

0,5 m Kjetting Galv.

50 + 50(51)m Kevlar

RBR Concerto SNR.201403 302 578 18:47

4 Glasskuler
2 m Kjetting Gulv.
0,5 m Kjetting Galv.
100 (102) m Kevlar

RBR Solo SNR.102492 408 472 18:40

200 (207)m Kevlar

RBR Solo SNR.102487 615 265 18:33

50(51) m Kevlar

100+100(104) m Kevlar

NORTEK Sig 55 SNR: 200130 304 576 18:47

SBE37 SNR. 23177
2 m Kevlar

Contros SNR. 1220-001

Svivel

AR861B2S SNR. 2630 Arm: 2BE9
Release: 2B55

3 m Kevlar

2 m Kjetting

ANKER 1100 kg 880 0

Figure 13: AT800-7

Institute of Marine Research
Mooring Instruments

Ship plat orm:	KPH		
Stat on name:	Atwain-Ateros-BIOAC-02		
Lat tude:	N 81° 32.892	Longitude:	E 30°53.358
Bot om depth [m]	872m	Total height [m]	
Outgoing date:	09.NOV.2021	Outgoing t me:	13:51utc
Incoming date:		Incoming t me:	

Argos		S/N:	154
PTTID:	29532	Hex:	
Acoust c Release Ixblue			
Type:	RS	S/N:	21350036
Bat type:	Alk. original	Bat exp:	Aprox. june2025
Range code:	3525	Release code:	3555

Comments for deployment operat ons:

Instrument start 10.11.21 kl12utc

Comments for recovery operat ons:

All rope from NP should be change out with 200+200m
Blinking light start blinking approx 10min af er surfacing
Bat ery on release must be changed next recovery

Instruments / sensors

#	Brand	Type	S/N	Depth	Comment
1	Nortek	Signature 100	101598	395	2års utset
2	Novatech	Blinkelys	F10-061	395	New bat
3	SIS	ArgoTx	154	395	New saf LS20
4	t				
5	t				
6	t				
7	t				

Instruments conf g info

#	Type/sn	Ping/ Time/cell	Record interval	Bat ery info	Comment
1	Sig100adcp	180s/10m	2t	lithium	2xlithium
2	Sig100echo		20sek		400m range
3	t				
4	t				
5	t				
6	t				

Rigging parts

#	Type	Qty
1	Shackle galvanized steel	
2	Shackle stainless steel 3.25 T	
3	Kevlar tau	
4	Strope	
5	Ring (plast c/metal)	
6	Strope	
7	Ring (plast c/metal)	

Responsible for deployment or recovery operat ons:

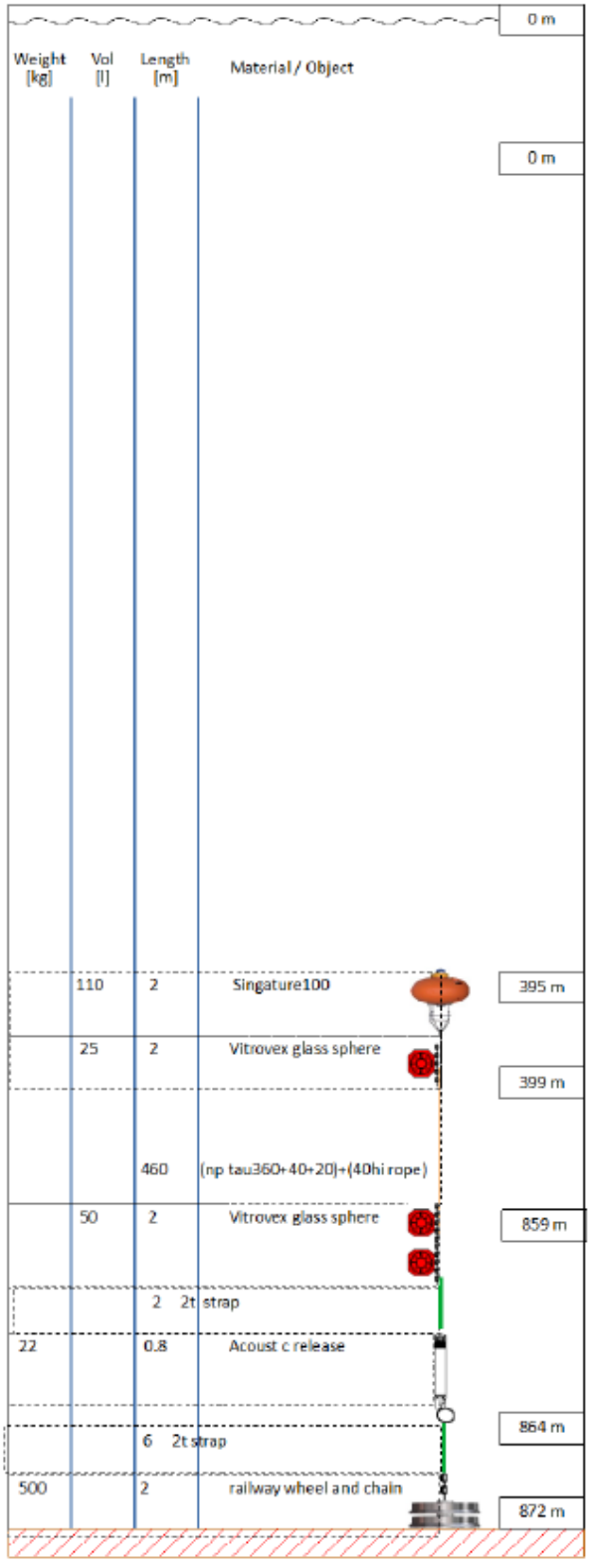

Figure 14: AT800-BioAc-2

Appendix G. Diagrams of deployed moorings

NLEG M1-5 dybde 268 519,6

Instrument		Dybde	Element	Lengde	Høyde	Vekt l	Vekt v
		22			246		
100812	22		Signature 500	1			-50
66091	23	23	Concerto+cl+par		245		
			2 Glasskuler	2			-50
		25			243		
			Kevlar	2			
		27			241		
			Kjetting	0,5		1	0,85
102483	42	27,5	Solo		240,5		
			Kevlar	20			
		47,5			220,5		
			Kevlar	10			
		57,5			210,5		
			HF36	1			
204983	58	58,5	Concerto		209,5		
			Kevlar	2			
		60,5			207,5		
236			Aural	2		49	21
		62,5			205,5		
			Kevlar	2			
		64,5			203,5		
			4 Glasskuler	2			-100
		66,5			201,5		
			Kjetting	0,5		1	0,85
102489	78	67	Solo		201		
			Kevlar	20			
204988	98	87	Concerto		181		
			Kevlar	50			
102494	135	137	Solo		131		
			Kevlar	10			
		147			121		
			Kevlar	20			
204989	170	167	Concerto		101		
			Kevlar	40			
102481	205	207	Solo		61		
			Kevlar	20			
		227			41		
			Kevlar	10			
		237			31		
			Kevlar	10			
		247			21		
24637			ADCP 150	2			-136
204990	242	249	concerto		19		
			Kevlar	2			
		251			17		
snr 1454, 09AB			Utløser	1		30	22
		252			16		
			Kevlar	2			
		254			14		
			Kjetting	2		4	3,4
		256			12		
			Anker	1		950	807,5
		257			11		

Figure 15: M1-5

Institute of Marine Research
Mooring Instruments

Ship platform:	KPH		
Station name:	*M1-BioAC-2*		
Latitude:	N79° 35.340	Longitude:	E28° 05.319
Bottom depth [m]	261	Total height [m]	
Outgoing date:	07.10.22	Outgoing time:	14:11utc
Incoming date:		Incoming time:	

Argos		S/N:	181
PTTID:	1577	Hex:	
Acoustic Release Ixblue			
Type:	AR861	S/N:	2666
Batt type:	Lith	Batt exp:	2029 12 april
Range code:	3B0A	Release code:	3B55

Comments for deployment operations:
Start recording 07.okt 1400utc
Comments for recovery operations:

Instruments / sensors					
#	Brand	Type	S/N	Depth	Comment
1	Nortek	Signature 100	101598	253	2års utsett
2	Novatech	Blinkelys	F10-062	253	ok
3	SIS	ArgoTx	181	253	ok
4	tt				
5	tt				
6	tt				
7	tt				

Instruments config info					
#	Type/sn	Ping/ Time/cell	Record interval	Battery info	Comment
1	Sig100adcp	180s/10m	2t	lithium	1,5xlithium
2	Sig100echo		20sek		250m range
3	tt				
4	tt				
5	tt				
6	tt				

Rigging parts		
#	Type	Qty
1	Shackle galvanized steel	
2	Shackle stainless steel 3.25 T	
3	Kevlar tau	
4	Strope	
5	Ring (plastic/metal)	
6	Strope	
7	Ring (plastic/metal)	

Responsible for deployment or recovery operations:
Terje

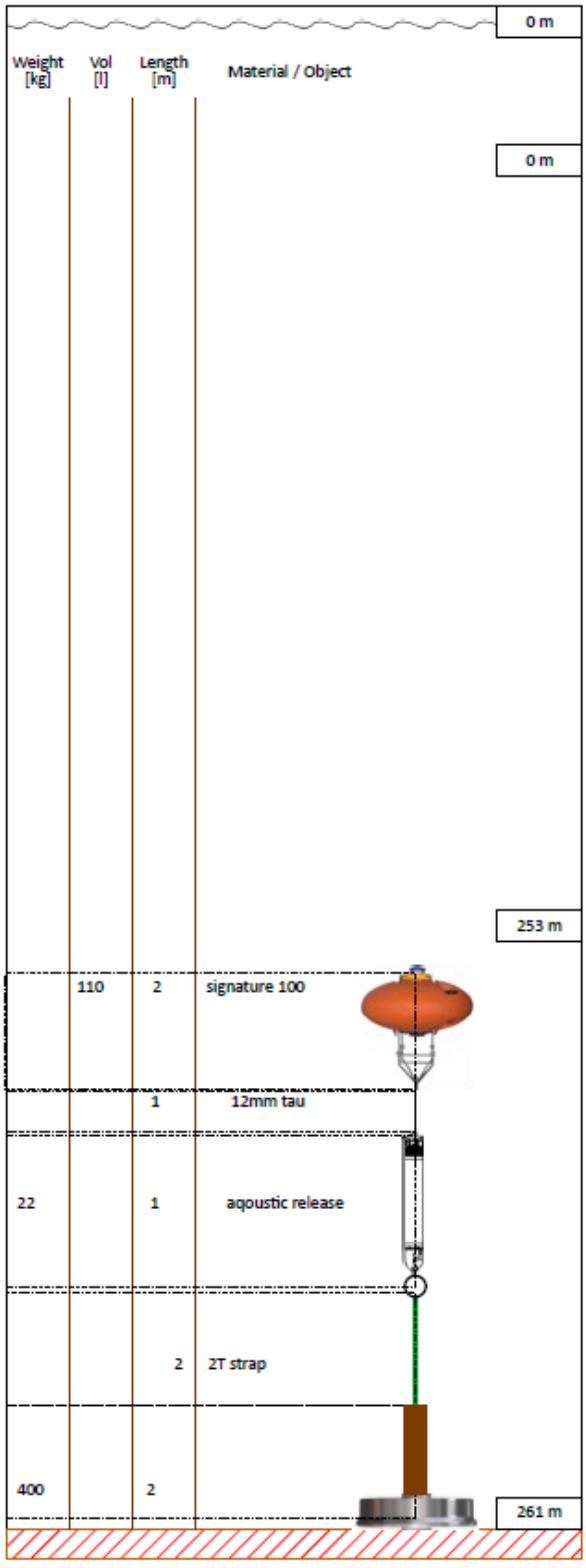

Figure 16: M1-BioAc-2

Institute of Marine Research
Mooring Instruments

Ship platform:	KPH		
Station name:	*AT800-BioAc-600*		
Latitude:	N 81° 32.761	Longitude:	E 30°50.067
Bottom depth [m]	872m	Total height [m]	
Outgoing date:	05.OKT.2022	Outgoing time:	11:51utc
Incoming date:		Incoming time:	

Argos		S/N:	277
PTTID:	60205	Hex:	
Acoustic Release Ixblue			
Type:	AR861	S/N:	2667
Batt type:	Lithium	Batt exp:	12april2029
Range code:	3B0B	Release code:	3B55

Comments for deployment operations:
Instrument start 05.10.22 kl2000utc
Comments for recovery operations:
Alle tau har syrefast stål kauser. Man bør vurdere å bytte ut np tau med hi kevlar tau og sette inn en kule under toppkule for lettere opptak

Instruments / sensors

#	Brand	Type	S/N	Depth	Comment
1	Nortek	Signature 100	101647	601	2års utsett
2	Novatech	Blinkelys	F10-061	601	Batt ok
3	SIS	ArgoTx	154	601	New saft LS20
4	tt				
5	tt				
6	tt				
7	tt				

Instruments config info

#	Type/sn	Ping/ Time/cell	Record interval	Battery info	Comment
1	Sig100adcp	180s/10m	2t	lithium	2xlithium
2	Sig100echo		20sek		310m range
3	tt				
4	tt				
5	tt				
6	tt				

Rigging parts

#	Type	Qty
1	Shackle galvanized steel	
2	Shackle stainless steel 3.25 T	
3	Kevlar tau	
4	Strope	
5	Ring (plastic/metal)	
6	Strope	
7	Ring (plastic/metal)	

Responsible for deployment or recovery operations:
Terje Hovland

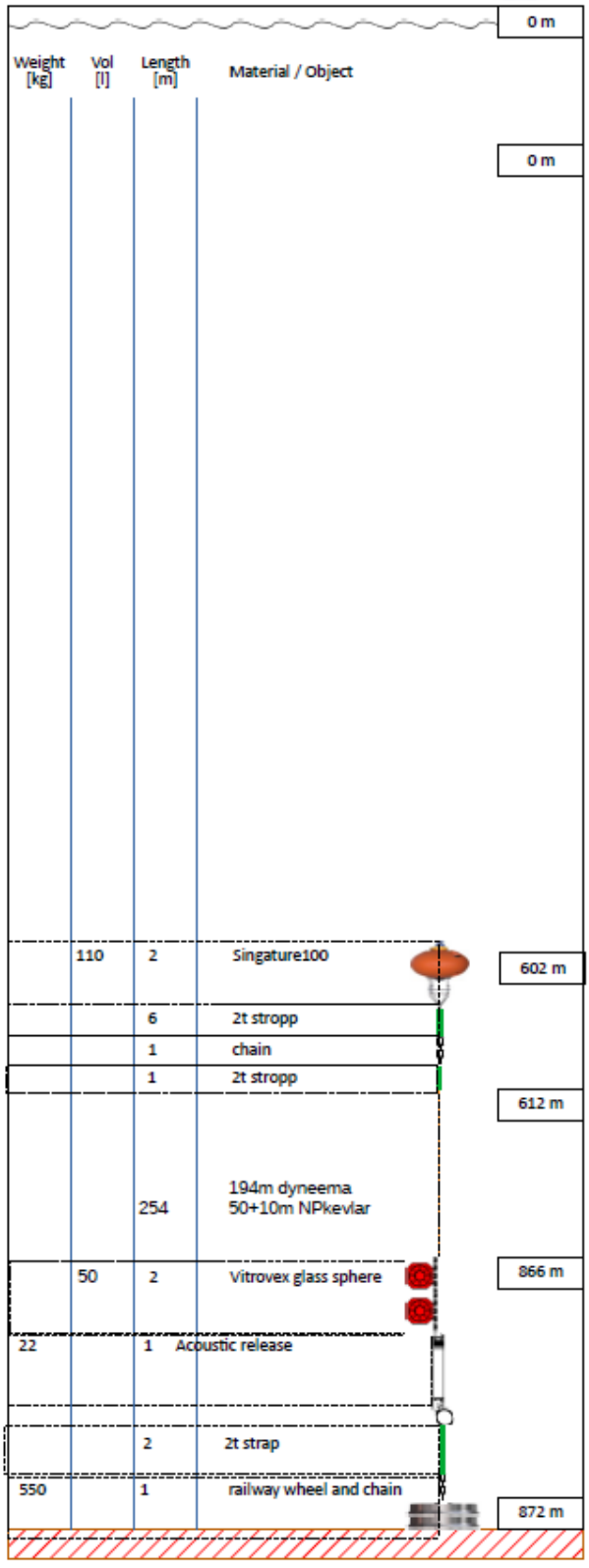

Figure 17: AT800-BioAc-600

Institute of Marine Research
Mooring Instruments

Ship platform:	KPH		
Station name:	*AT800-BioAc-300*		
Latitude:	N 81° 32.878	Longitude:	E 30°53.398
Bottom depth [m]	867m	Total height [m]	
Outgoing date:	04.NOV.2022	Outgoing time:	13:18utc
Incoming date:		Incoming time:	

Argos		S/N:	154
PTTID:	29532	Hex:	
Acoustic Release Ixblue			
Type:	AR861	S/N:	2368
Batt type:	Lithium	Batt exp:	18feb 2028
Range code:	1BBB	Release code:	1B55

Comments for deployment operations:
Instrument start 04.10.22 kl22utc
Comments for recovery operations:
2*100m dyneema tau har galvaniske kauser Husk å sette inn avlaster ring under øvre vitrovex kule neste år

Instruments / sensors

#	Brand	Type	S/N	Depth	Comment
1	Nortek	Signature 100	101121	297	2års utsett
2	Novatech	Blinkelys	F10-06x	297	Batt ok
3	SIS	ArgoTx	154	297	Batt ok
4	tt				
5	tt				
6	tt				
7	tt				

Instruments config info

#	Type/sn	Ping/ Time/cell	Record interval	Battery info	Comment
1	Sig100adcp	180s/10m	2t	lithium	2xlithium
2	Sig100echo		20sek		300m range
3	tt				
4	tt				
5	tt				
6	tt				

Rigging parts

#	Type	Qty
1	Shackle galvanized steel	
2	Shackle stainless steel 3.25 T	
3	Kevlar tau	
4	Strope	
5	Ring (plastic/metal)	
6	Strope	
7	Ring (plastic/metal)	

Responsible for deployment or recovery operations:
Terje Hovland

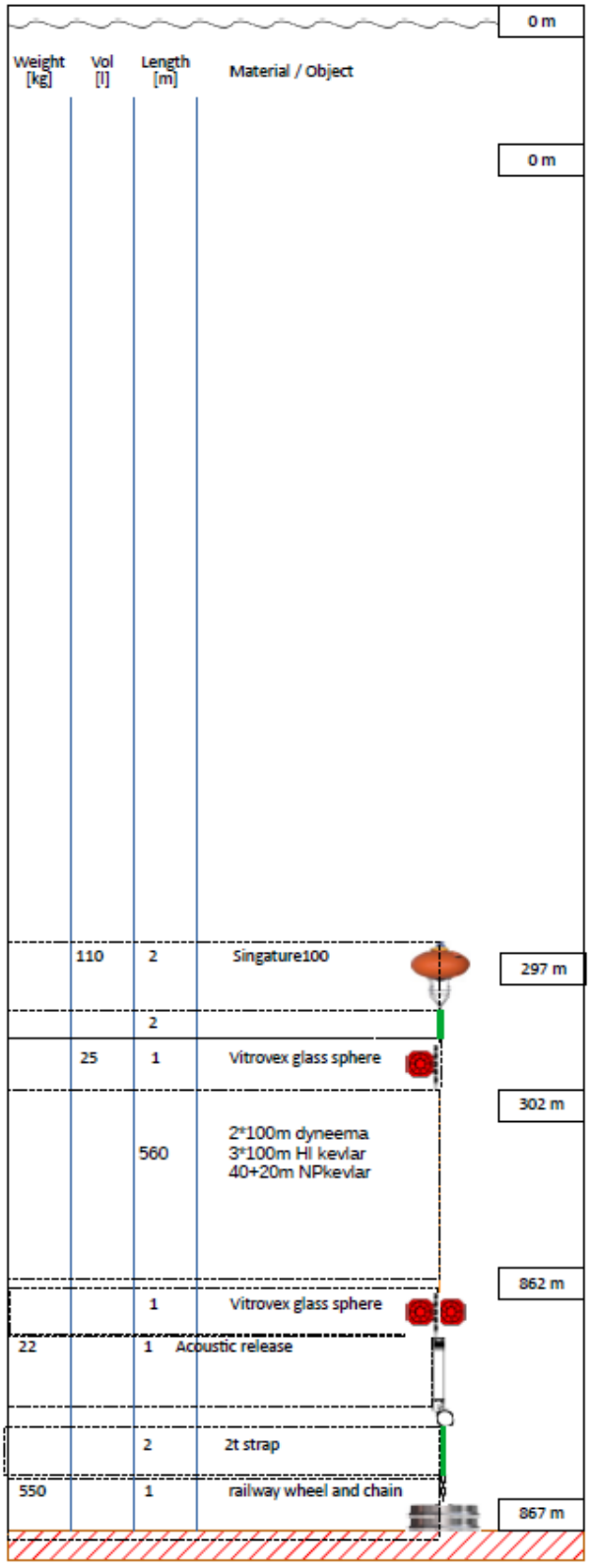

Figure 18: AT800-BioAc-300

ATWAIN AT200 dybde 205

Instrument			Dybde	Element	Lengde	Høyde	Vekt l	Vekt v
			30			175		
	100802			Signature 500	1			
			31			174		
				6 glasskuler	3		150	-150
	204984	33	34	Concerto		171		
		33		Kevlar	10			
			44			161		
				Aural	2			60
			46			159		
				Kjetting	0,5			1
	102493	40	46,5	Solo		158,5		
				Kevlar	50			5
	204981	50		Concerto				
	102482	75	96,5	Solo		108,5		
				Kevlar	50			2
			146,5			58,5		
		125		Kevlar	20			5
	204980	100		Concerto				
	102476	125		Solo				
	60613	150		Concerto				
			166,5			38,5		
				Kjetting	0,5			
			167			38		
				Kevlar	20			2
			187			18		
	2463(			ADCP 150	2			-136
			189			16		
				2 Glasskuler	2		40	-52
	60612	195	191	Concerto		14		
				Kevlar	2			
			193			12		
	snr 2632							
	2BEB			Utløser	1		30	22
			194			11		
				Kevlar	2			
			196			9		
				Kjetting	2			1
			198			7		
				Anker	1			1000
			199			6		
							m/anker	760
							u/anker	-240

Figure 19: AT200-7

ATWAIN AT800 dybde 880

Instrument			Dybde	Element	Lengde	Høyde	Vekt l	Vekt v
			30			850		
								
				4 Glasskuler	2			-100
	66090	33	32	ConcertoCIP		848		
				Kevlar	2			
			34			846		
				Kjetting	0,5			
	102480	40	34,5	Solo		845,5		
				Kevlar	20			
	201402	50	54,5	Concerto		825,5		
	102484	60		Solo				
				Kevlar	50			
	201408	100	104,5	Concerto		775,5		
								
				4 Glasskuler	2			-100
			106,5			773,5		
				Kjetting	0,5			
	102479	125	107	Solo		773		
	201410	150		Concerto				
				Kevlar	100			
			207			673		
				Kjetting	0,5			
	201411	210	207,5	Concerto		672,5		
				Kevlar	100			
	201415	310	307,5	Concerto		572,5		
				Kjetting	0,5			
			308			572		
				Kevlar	100			
	102485	410	408	Solo		472		
	102476	510		Solo				
				Kevlar	200			
			608			272		
								
	20013(			Signature 55	1,5			-130
	201145	610	609,5	Concerto		270,5		
				Kjetting	0,5			
			610			270		
				Kevlar	50			
	102490	710	660	Solo		220		
				Kevlar	100			
			760			120		
				Kevlar	100			
			860			20		
								
				4 Glasskuler	2			-100
	204987	872	862	Concerto		18		
				Kevlar	2			
			864			16		
								
	snr 2630, 2BE9			Utløser	1		30	22
			865			15		
				Kevlar	2			
			867			13		
				Kjetting	1			
			868			12		
				Anker	2		1000	850
			870			10		

Figure 20: AT800-8

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.

Universitas Oslo Mdccckxi
Universitas Bergensis
The Arctic University of Norway UIT
Institute of Marine Research
Norwegian Polar Institute
Norwegian Meteorological Institute
UNIS The University Centre in Svalbard
NTNU
NERSC
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

nansenlegacy.org

nansenlegacy

nansenlegacy@uit.no

Photo cover: Harald Dag Jølle (NPI)