

Ocean current, temperature and salinity
measurements from moorings north of Svalbard:
September 2018 - November 2019

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1 Introduction

The dataset described herein was collected as a part of the Nansen LEGACY project, funded by the Research Council of Norway (project number 276730).

Nansen LEGACY (2018 – 2023) is a national collaborative project between ten Norwegian research institutions, with an aim to improve our understanding of a changing marine Arctic climate and ecosystem, and will provide an observation-based scientific knowledge needed for future sustainable resource management in the transitional Barents Sea and the adjacent Arctic Basin. Activities in the project include multiple interdisciplinary cruises, mainly with the ice-going research vessel Kronprins Haakon, and oceanographic moorings for process studies as well as monitoring in key locations.

This report summarizes the details of moorings, instrument setups and processing, and gives an overview of the data collected. The data set cover the period from September 2018 to September/November 2019, and includes time series of ocean temperature, salinity and currents across the continental slope north of Svalbard. The data set is submitted to and openly available from the Norwegian Marin Data Centre [1]. Metadata and attributes for each submitted netCDF file (ncdisp output) are provided as an appendix.

2 Moorings

2.1 Overview

6 moorings were deployed in two arrays of 3 moorings each across the continental slope north of Svalbard (Figure 1). The two arrays of moorings reported here were deployed with a general aim to quantify the mean structure and transport in the Atlantic boundary current north of Svalbard, identify the time scales of variability and describe the processes that are important for loss of heat and buoyancy from the boundary current. The positions are detailed in table 1 and shown in figure 1. The western array (composed of W1, W2 and W3) was deployed along 18°E. The eastern array (composed of E1, E2 and E3) was deployed along 24°E. Each mooring array captured the core of the Atlantic Water, with a shallow mooring (at 300-400 m depth, W1 and E1), one mooring at ~ 700 m depth (W2 and E2) and a deep mooring at ~ 1200 m depth (W3 and E3). Across-isobath distance between W1 and W3 is 34 km, across-isobath distance between E1 and E3 is 18 km and along-isobath distance between the western and the eastern array is 94 km. Each mooring was equipped with instruments logging temperature, salinity and currents. The details of the instrumentation are given in Table 2 and in the mooring diagrams in the Appendix.

All moorings were deployed in September 2018 with anchor last, from the stern. W3 was initially deployed on 15 September 2018 at 9:15 UTC in position: 81°30.616'N, 18°22.837'E at an echo depth of 1885 m, 500 m deeper than the target depth. The top float imploded and the mooring was recovered on 20 September 2018 at 13:30 UTC. The mooring was supplemented with new buoy

and redeployed at depth $\sim 1200\text{m}$ on 20 September 2018 at 18:10 UTC.

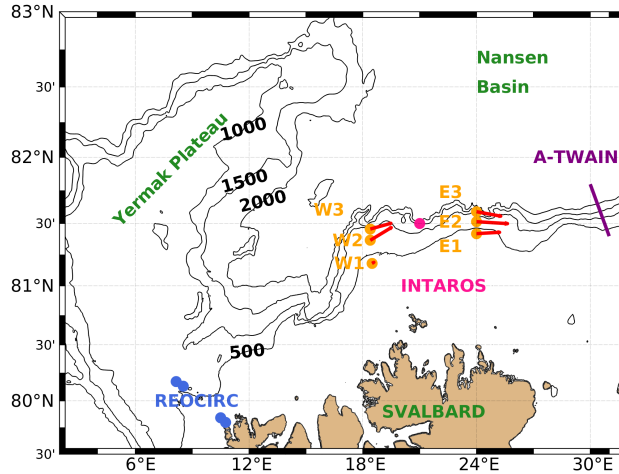


Figure 1: Mooring location in orange, with time and depth-averaged currents in red arrow. Are also shown in this figure the moorings deployed in the region in 2017-2018 from other projects: the A-TWAIN mooring line (in purple), the INTAROS mooring (in pink) and the REOCIRC ones (in blue). The black contours are isobaths every 500 m from IBCAO-v3 [2].

Table 1: Mooring deployment details. Deployment time is the anchor drop. Bottom depth is the best estimate using the ship’s echo sounder measurement, instrument pressure records and the mooring part lengths.

Mooring	Latitude	Longitude	Depth	Deployed (UTC)	Recovery (UTC)
W1	81°N 10.979'	18°E 29.052'	401	15.09.2018, 1820	21.09.2019, 0400
W2	81°N 22.686'	18°E 23.789'	727	15.09.2018, 1420	21.09.2019, 0800
W3	81°N 27.356'	18°E 23.730'	1202	20.09.2018, 1810	21.09.2019, 1330
E1	81°N 24.925'	24°E 00.000'	300	16.09.2018, 0745	23.11.2019, 1429
E2	81°N 30.813'	23°E 59.853'	706	16.09.2018, 1120	23.11.2019, 1905
E3	81°N 35.453'	23°E 59.982'	1222	16.09.2018, 1730	23.11.2019, 2150

3 Instrumentation and set-up

The moorings were equipped with temperature, salinity, pressure and current sensors, designed to capture the oceanographic variability in a large fraction

Table 2: Instruments contained on each mooring together with their sampling details. We only show the instrument that gave data.

Mooring	Instrument	Depth	Interval
W1	ADCP _u RDI 75kHz	390	1h
W2	ADCP _u RDI 75kHz	525	1h
	ADCP _d RDI 150kHz	525	20 min
	RMC7	705	1h
	SBE56-T	79, 105, 156, 208, 360, 411, 528, 621	5 min
	SBE37-CTD	53, 461, 670	5 min
	SBE37-CT	310	5 min
	SBE39-T	259	5 min
W3	ADCP _u Nortek S55	800	1h
	ADCP _d Nortek S100	800	1h
	Seaguard CTD	1180	10 min
	SBE56-T	104, 153, 204, 254, 406, 508, 712, 1064	5 min
	SBE37-CTD	103, 962	5 min
	SBE37-CT	1165	5 min
	SBE39-TP	610	5 min
	RBR-CTD	304, 794	5 min
E1	ADCP _u RDI 300kHz	150	20 min
	RMC7	280	1h
	Seaguard CTD	192	10 min
	SBE56-T	64, 217, 276	5 min
	SBE37-CTD	40, 111, 241	5 min
	SBE39-TP	166	5 min
E2	ADCP _u RDI 75kHz	500	1h
	ADCP _d RDI 150kHz	500	20 min
	RMC7	680	1h
	SBE56-T	49, 77, 134, 190, 348, 398, 511, 555	5 min
	SBE37-CTD	21, 449, 654	5 min
	SBE37-CT	297	5 min
	SBE39-TP	246	5 min
E3	ADCP _u Nortek S55	800	1h
	ADCP _d Nortek S100	800	1h
	Seaguard TD	1193	10 min
	SBE56-T	97, 148, 199, 250, 402, 504, 706, 850	5 min
	SBE37-CTD	46	5 min
	SBE37-CT	956, 1163	5 min
	SBE39-TP	605, 1062	5 min
	RBR-CTD	301, 787	5 min

of the water column at hourly and longer time scales. The moorings were equipped with Sea-Bird Electronics temperature (SBE56 ad 39) and conductivity and temperature recorders (SBE37 Microcat), RBR Concertos CTD, Aanderaa Instruments (AADI) point current meters (RCM7 and Seaguard RCM), and acoustic Doppler current profilers (ADCP, RD-Instrument 300 kHz Sentinel, 150 kHz Sentinel 75 kHz Longranger, and Nortek Signature S55 kHz and S100 kHz). Some of the instruments were equipped with a pressure sensor. The details of the mooring instrumentation are given in table 2. Instrument depths listed in Table 2 are corrected using the instrument pressure records and the mooring part lengths, and may differ from the planned target heights. A detailed drawing of the moorings with instrumentation and serial numbers is given in Appendix.

All SBE instruments were set to sample a single record. SBE-39 recorded at 5 min intervals. Microcats (SBE37 and RBR CTD Concerto) recorded at 5 min intervals. SBE56-Tloggers recorded at 1 min intervals. The conductivity cell of all the CTD was a flow through (i.e., none were equipped with an internal pump).

SeaGuards recorded 10 min averages of 300 ping in burst mode.

All RDI ADCPs recorded ocean currents in Earth coordinates after internally processing and averaging single ping profiles into ensembles, and allowing for 3-beam solutions. 75 kHz instruments profiled in 8 m bins, 40-ping burst (3-s pings) averages every 1 h. 150 kHz instruments profiled in 4 m bins, 40-ping burst (2-s pings) ensembles every 20 min. 300 kHz instruments profiled in 4 m bins, 50-ping burst (1 s pings) ensembles every 20 min.

Nortek Signature ADCPs were fitted with single lithium battery set (1800 Wh) and recorded in Earth coordinates in "Long range" mode. All single ping data were recorded (for post processing) as well as on-board processed average profiles. The deployment setup for the S55's was 12-m thick 70 cells, 4-m blanking distance, 5 min averages (50 pings) every 1 hour, giving horizontal velocity precision of 1.5 cm/s. The setup for the S100's was 8-m thick 51 cells, 4-m blanking distance, 2 min averages (60 pings) every 1 hour, giving a horizontal velocity precision of 1.1 cm/s. Raw profiles are post-processed as described later.

The instrumentation was deployed in the upper 80 m of the Legacy mooring W1 is supplied by NOC and Bangor University as part of the PEANUTS (primary production driven by escalating Arctic nutrient fluxes) project. The instruments deployed on the Legacy mooring W1 aimed to quantify turbulent mixing rates at the base of the surface mixed layer over a seasonal cycle, quantify nutrient fluxes, measure nitrate concentrations and fluorescence-derived chlorophyll-a concentration below the mixed layer over a seasonal cycle.

3.1 Recovery notes

The western array was recovered on the 21 September 2019 from the *R/V Kropprins Haakon* (cruise 2019706). W2 and W3 were recovered entirely. Only the ADCP was recovered on W1 and the instrument showed indications of severe

dragging, probably due to a fishing boat. We are missing at W1 all the data on the hydrography and the data from the PEANUTS module. The eastern array could not be recovered during this cruise because of the sea ice conditions.

The eastern array was recovered on 23 November 2019 from the *R/V Kronprins Haakon* (cruise 2019710) during the mooring service cruise of Nansen Legacy and the Fram Centre A-TWAIN/SIOS-InfraNor project. E1, E2 and E3 were recovered fully.

With one exception, all instrument positions agreed with deployment drawings and tables. At W3, the upper SBE37 (sn 6097) slides from 5 m to 100 m after one week of measurement. We decided to ignore this one week of data from the SBE37 6097, and considered the instrument to have a target depth of 100m. On E1, one SBE56 T-logger (s/n 1955) was damaged during recovery (the mooring line entangled around the propeller pod). We could not communicate with SBE39 3251 at W2.

4 Data processing

All data were downloaded and converted to physical units using the manufacturers' software. The first step of processing was to inspect the pressure records of the instruments, and using the information about their planned target depths and mooring element lengths, to identify the best estimate of the actual target depth after deployment. Using the pressure record from the bottom-most instruments (and converting to depth at that latitude) and the known instrument position from seabed, this also gives a best estimate for the total water depth.

The pressure records did not show a significant trend in time. The in situ target depth for each instrument with pressure record was estimated from the average of lowest 5 percentile of the time series (least mooring blowdown leads to smaller pressures), and rounded downward to the nearest integer. Once the deployed target depths were obtained for each instrument, their time variable depth (pressure) was constructed at each time stamp using vertical interpolation of hourly averaged pressure time series. Depth of the instrument without pressure sensor was estimated by interpolating linearly the depth of the instruments with pressure with time. This approach was satisfactory, instead of applying a mooring dynamics model, because there were multiple pressure sensors available in each mooring line.

4.1 Salinity and temperature

Time series were inspected for drifts in temperature and salinity and were corrected if necessary. Obvious outliers from salinity records were excluded (threshold values differed for each instrument). Salinity and temperature measurements from the RCM are excluded. None of the Microcats were pumped and caution is advised in interpreting the salinity data from the CTDs.

We compared mooring data to CTD casts performed shortly after each mooring deployment. The CTD cast was compared to mooring data within 1 hour,

and to the deployment-averaged profiles. Some instruments showed a systematic offset (particularly when looking at month/yearlong vertical profiles). Salinity of SG1902 at W3 does not agree at all with the SBE37 located 10 m above and was then disregarded. Salinity RBR60646 at W3 went off after the 16th of May 2019 and was disregarded after that date. A summary of the different offsets applied is shown in the following table (Table 3).

Table 3: Corrections applied in T and S

Mooring	Instrument	SN	Parameter	Offset/Corrections
W2	SBE37	5452	S	0.015
W3	SBE37	7336	S	0.013
W3	SBE37	6018	S	0.008
W3	RBR	60646	S	-0.026
E1	SBE37	7372	S	0.01
E1	SG	1898	S	-0.1
E2	SBE37	7821	S	0.005
E2	SBE37	7223	S	0.005
E2	SBE37	14666	S	0.005
E2	SBE56	4315	T	0.25
E3	RBR	60647	S	-0.02
E3	SBE37	4096	S	0.02
E3	SBE37	8973	S	0.008
E3	SBE37	8000	S	0.008

Once the salinity data were corrected with offsets, a basic despiking was applied.

4.2 Current profilers and currentmeters

4.2.1 Magnetic declination

The magnetic declination was corrected for each instrument. Declination is calculated using the NOAA’s magnetic field calculator at <https://www.ngdc.noaa.gov/geomag/calculators/magcalc.shtml#declination>. A constant magnetic declination was chosen for the whole year, as the declination was changing by about 0.6° per year. For the eastern array, the declination is 17° and it is 13° for the western array.

4.2.2 RDI instruments

The uplooker ADCP RDI 75 kHz instruments at W1, W2 and E2 were set to sample hourly-averaged ensembles. The downlooker ADCP RDI 150 kHz at W2 and E2, and the uplooker RDI300 at E1 recorded 20 minute averages.

The RDI ADCPs were set to sample on Earth coordinates, and process the data internally, including tilt correction, bin-mapping, 3-beam solutions and ensemble averaging. Data from the RDI instruments are exported to MATLAB

format using the winADCP software, and further post processed in MATLAB. Correction for the magnetic declination was applied. We flagged data points as bad when the 'percent-good' parameter was less than 50% or when pitch and roll were in excess of 20° , or error velocity exceeded 1 m s^{-1} , or the vertical velocity exceeded 1 m s^{-1} , or the horizontal velocity exceeded 2 m s^{-1} . Depths cells close (within 10% of the total instrument range) to the surface (for upward pointing) or to the seabed (for downward pointing ADCPs) were also flagged as bad. After removing these points, together with the times prior to and after the deployment and recovery, we applied the following quality control. A smoothed version of the error velocity was calculated by moving averaging in time and range using 20 point length vertical and time windows. The standard deviation (std) of the original data at each bin was calculated. At each bin, outliers were identified as velocity measurements exceeding ± 3 std envelope of the smoothed values. Remaining spikes, identified as velocity measurements exceeding ± 3 std in 40 ensemble windows at each bin, were removed. Data gaps were filled if they were less than 5 data gaps on the vertical and less than 3 hours on the horizontal.

The upward pointing ADCP RDI 75 kHz 21447 at W2 had a broken pin which probably short-circuited the instrument. Data were fragmented in several files, and in total about 72 h of data are missing over the entire year, with maximum gaps of about 9 hours.

When multiple ADCPs and point current meters were merged to generate water column profiles, the current direction did not always agree or join seamlessly. After the main processing, the small mismatch in mean current direction between the 2 RDI ADCP at W2 was corrected by forcing the 2 closest bin of each instrument to agree in direction. At E1, the uplooker ADCP was corrected by a 10 degree angle, to better fit with the local topography and the instruments below (table 4).

4.2.3 Nortek instruments

The raw profiles from the Nortek Signature instruments were post-processed in detail using the licensed software Ocean Contour (version 2.1). Using suitable subsets from the year-long records, compass was successfully recalibrated for each instrument. The processing was done using bin mapping and subsurface depth correction (hence mooring motion is accounted for). For both S55 and S100, data selection thresholds were percent good higher than 50, maximum amplitude 85 (80 for S55), minimum amplitude 30, minimum correlation 50, spike acceleration 2, amplitude spike 50, side lobe percentage 93. S55 profiles are obtained every hours as 5 min (50 ping) averages and S100 profiles are obtained every hours as 2 min (60 ping) averages. Finally the average profiles are exported to MATLAB format and further quality controlled and processed.

Some inferences were observed at W3 between the up-looker and the down-looker. It translated in the dataset of the down-looker by regular strips propagating in depth with time. These data gaps are about 12h and could be filled in the vertical as they were of less than 3 data points in the vertical. After the main

processing, the mismatch in mean current direction and intensity between the 2 Norteks at W3 was corrected by forcing the 2 closest bin of each instrument to agree in direction (table 4).

4.2.4 Other instruments

Seaguard CTD and RCM7 instruments were corrected from magnetic declination. We suspected that RCM7 vane at W2 was not reactive enough, as the heading of the RCM7 covers a way smaller range than the one of the RDI150. We used the heading of an average of the last 3 bins of RDI150 and applied to RCM7. For all SeaGuard and RCM7, an offset in heading was applied to fit the heading of the LADCP closest bin if needed. A summary of the different offsets is presented in the following table (Table 4).

Table 4: Corrections applied to the headings of the current data

Mooring	Instrument	SN	Offset/Corrections
W2	RDI75	21447	Heading of RDI150, 17226
W2	RCM7	11633	Heading of RDI150,17226
W3	S100	100758	Heading of S55,20062
W3	SG	1902	-10
E1	RDI300	10149	-10
E1	RCM7	12043	-25
E2	RDI150	17227	Heading of RDI75, 18447
E2	RCM7	7080	-27
E3	SG	240	5

For all instruments, the data were compared to the closest LADCP stations.

4.3 Gridded mooring data

Data from all instruments are first averaged into one hour intervals (if the sampling rate was faster) and then interpolated to a common 1-hour time stamp. As described previously, the time variable depth (pressure) records were constructed at each time stamp and for each instrument using vertical interpolation of the known target depth (of instruments with pressure sensor) and the measured pressure to the target depths of all instruments. Hourly profiles of temperature, salinity and horizontal current were then vertically interpolated to 10-m vertical resolution. A depth level with a data coverage less than 30% of the total measurement duration was excluded. This 1-hour-10 m vertical homogeneous, gridded data matrix was cleaned from short segments of data (especially in the outer ranges of the ADCPs) by filling with NaNs when a duration of segment with data was less than 3 days.

4.4 Accuracy and error

The initial accuracy of the sensors is sum up in table 5. The compass direction of the ADCPs is accurate to $\pm 2^\circ$. Conservative error estimates are $\pm 1 \text{ cm s}^{-1}$ for velocity, $\pm 10^{-2} \text{ }^\circ\text{C}$ for temperature and $\pm 10^{-2}$ for practical salinity. The salinity data from the unpumped CTDs, in general, must be used with caution. The 10-m vertically interpolated salinity product is not resolved and must be used with caution, referring to the target depths of conductivity sensors.

Table 5: Accuracy of the different instruments.

Instrument	Conductivity	Temperature	Velocity
SBE37 Microcat	$\pm 0.0003 \text{ S m}^{-1}$	$\pm 0.002^\circ$	
SBE56 T sensors		$\pm 0.002^\circ$	
RBR CTD	$\pm 0.003 \text{ S m}^{-1}$	$\pm 0.002^\circ$	
RDI ADCP 150kHz			1% of measured value
RDI ADCP 75kHz			1% of measured value
RDI ADCP 300kHz			1% of measured value
Nortek ADCP S55			1% of measured value
Nortek ADCP S100			1% of measured value
RCM7	$\pm 0.1\%$ of range	$\pm 0.05^\circ\text{C}$	$\pm 1 \text{ cm s}^{-1}$
Seaguard	$\pm 0.002 \text{ S m}^{-1}$	$\pm 0.03^\circ\text{C}$	$\pm 0.15 \text{ cm s}^{-1}$

5 Summary plots

5.1 Pressure time series

In the following set of figures, the pressure time series are presented for each mooring. These records were used to construct the time variable instrument position for all sensors before gridding the data in the vertical.

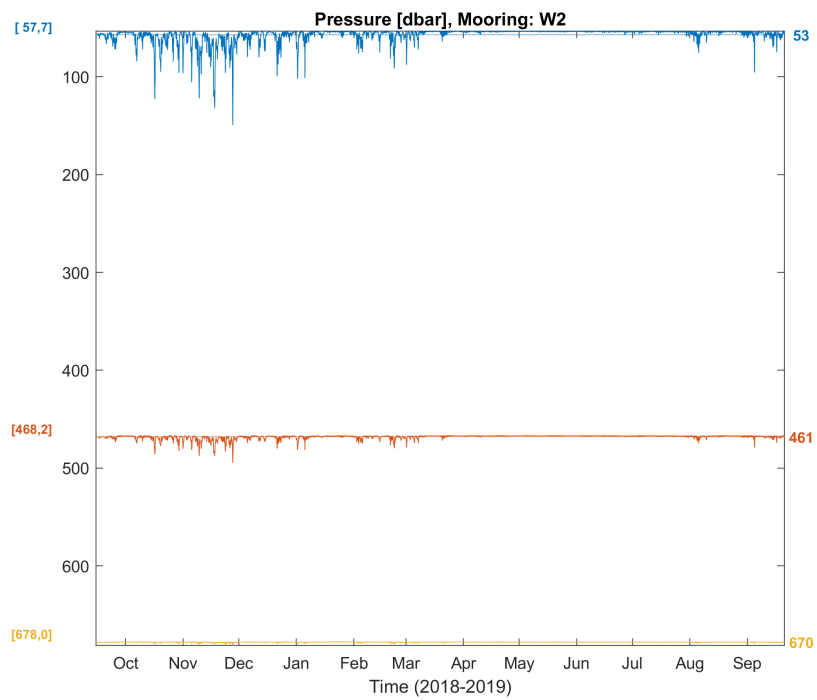


Figure 2: Pressure time series from various instruments on the mooring W2. Values on the left in brackets are the average and one standard deviation of the pressure record. Values on the right are the target depths of the pressure sensor.

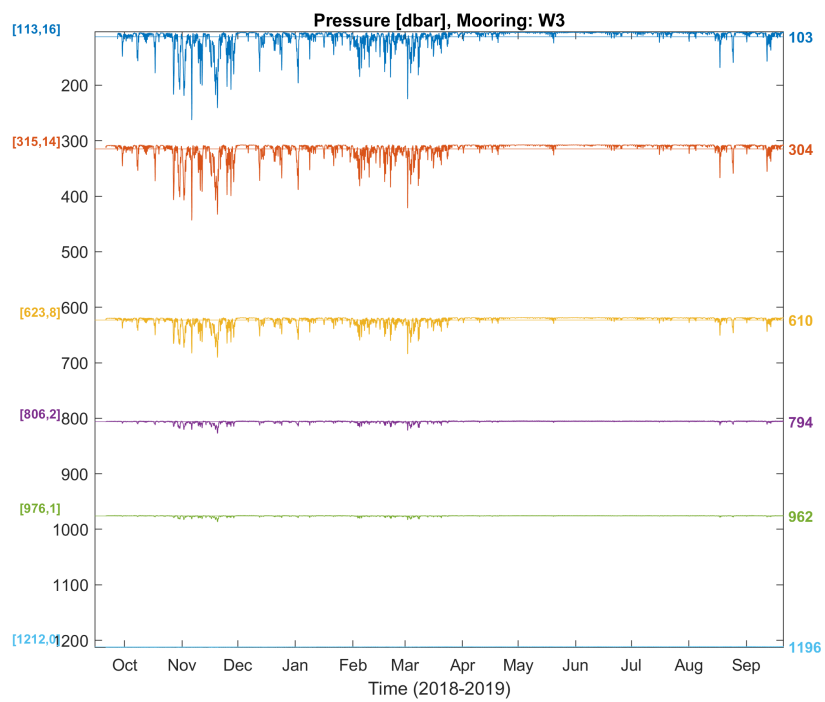


Figure 3: Same as Figure 2 but for mooring W3

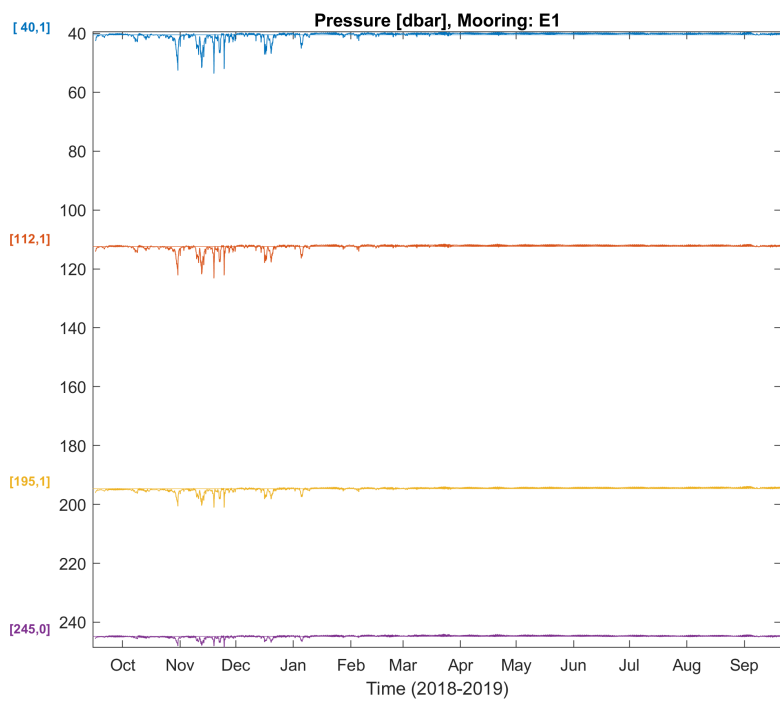


Figure 4: Same as Figure 2 but for mooring E1

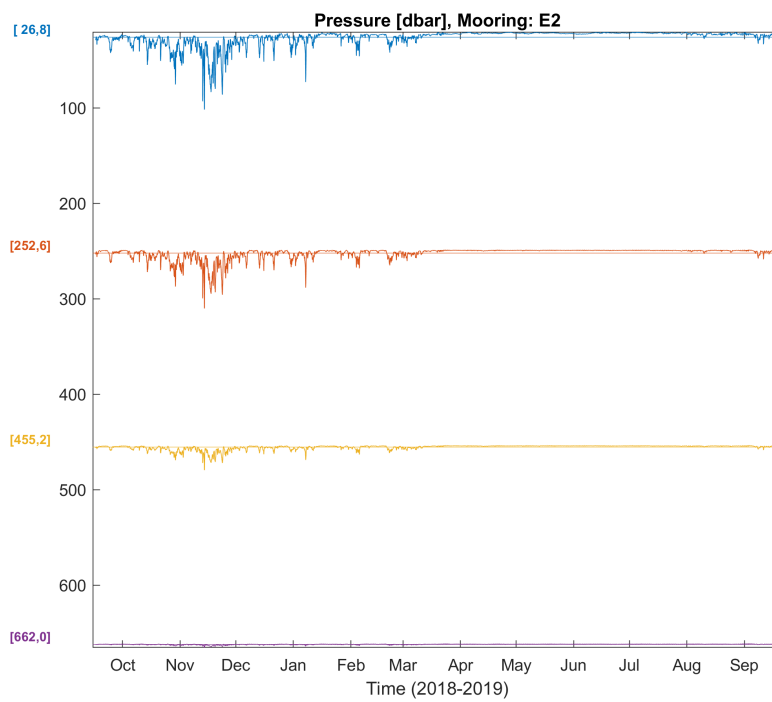


Figure 5: Same as Figure 2 but for mooring E2

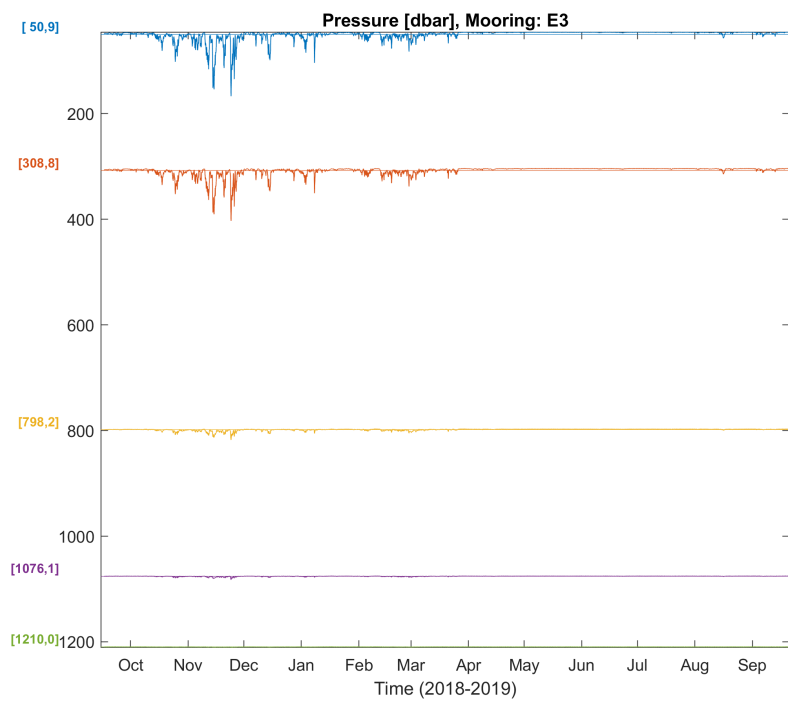


Figure 6: Same as Figure 2 but for mooring E3

5.2 Time-depth distributions of u , v , T and S

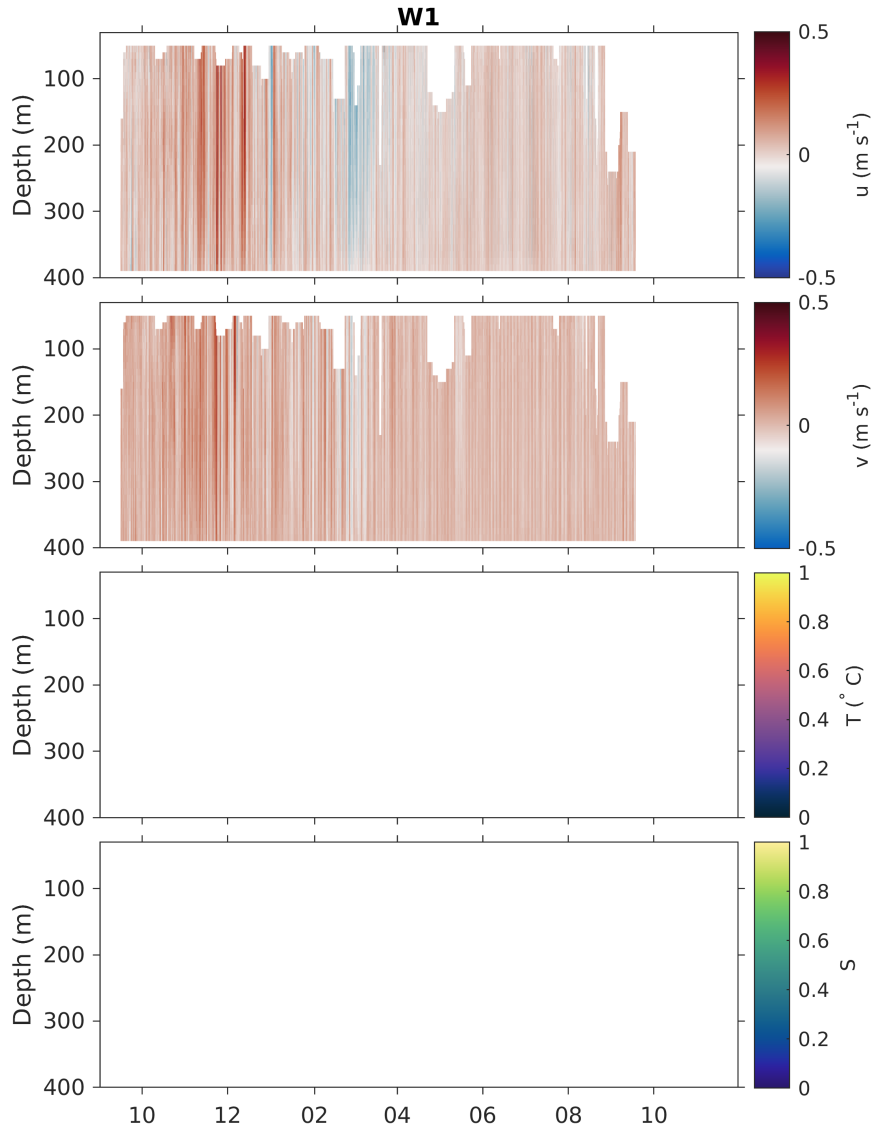


Figure 7: Time-depth distribution of east and north velocity components, temperature and practical salinity for W1. The hourly and 10-m gridded fields are shown without any smoothing and filtering. Gaps in data are due to instruments stopping recording, mooring blow down or the limited range of the ADCPs.

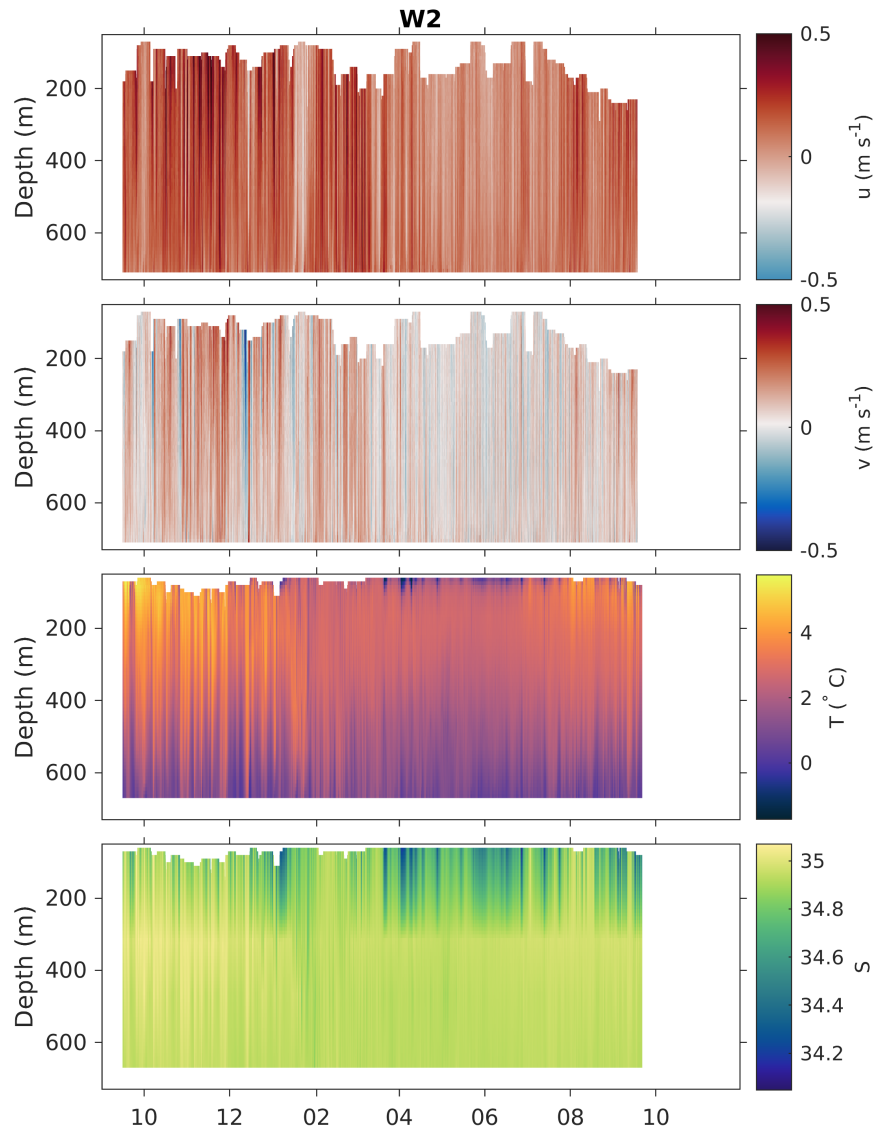


Figure 8: Same as figure 7 but for W2.

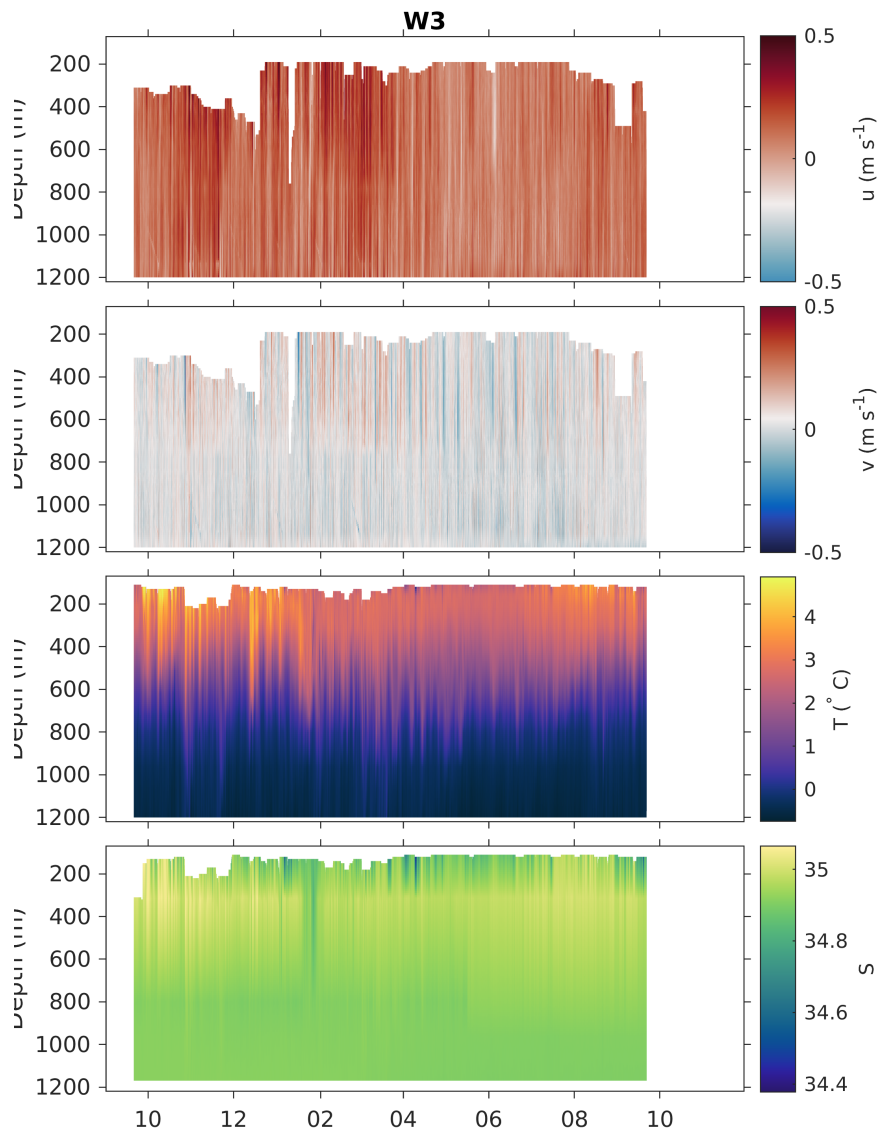


Figure 9: Same as figure 7 but for W3.

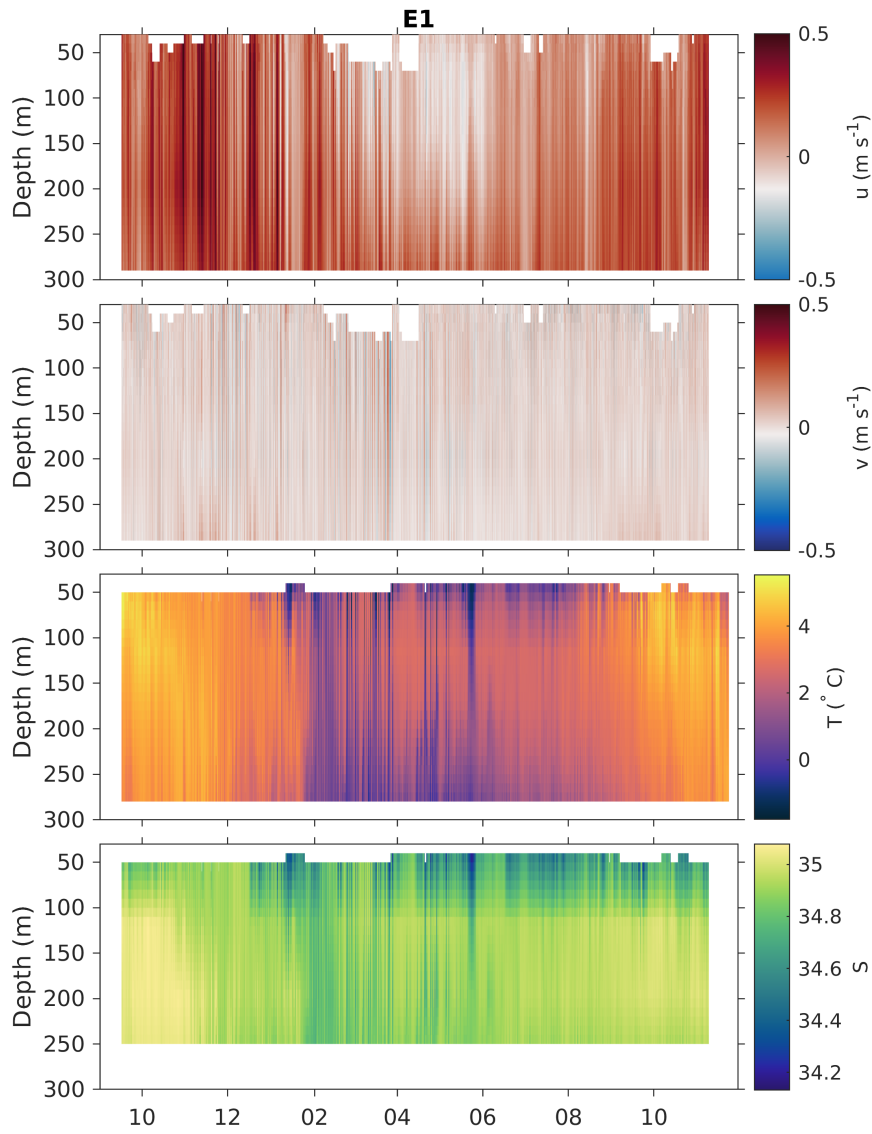


Figure 10: Same as figure 7 but for E1.

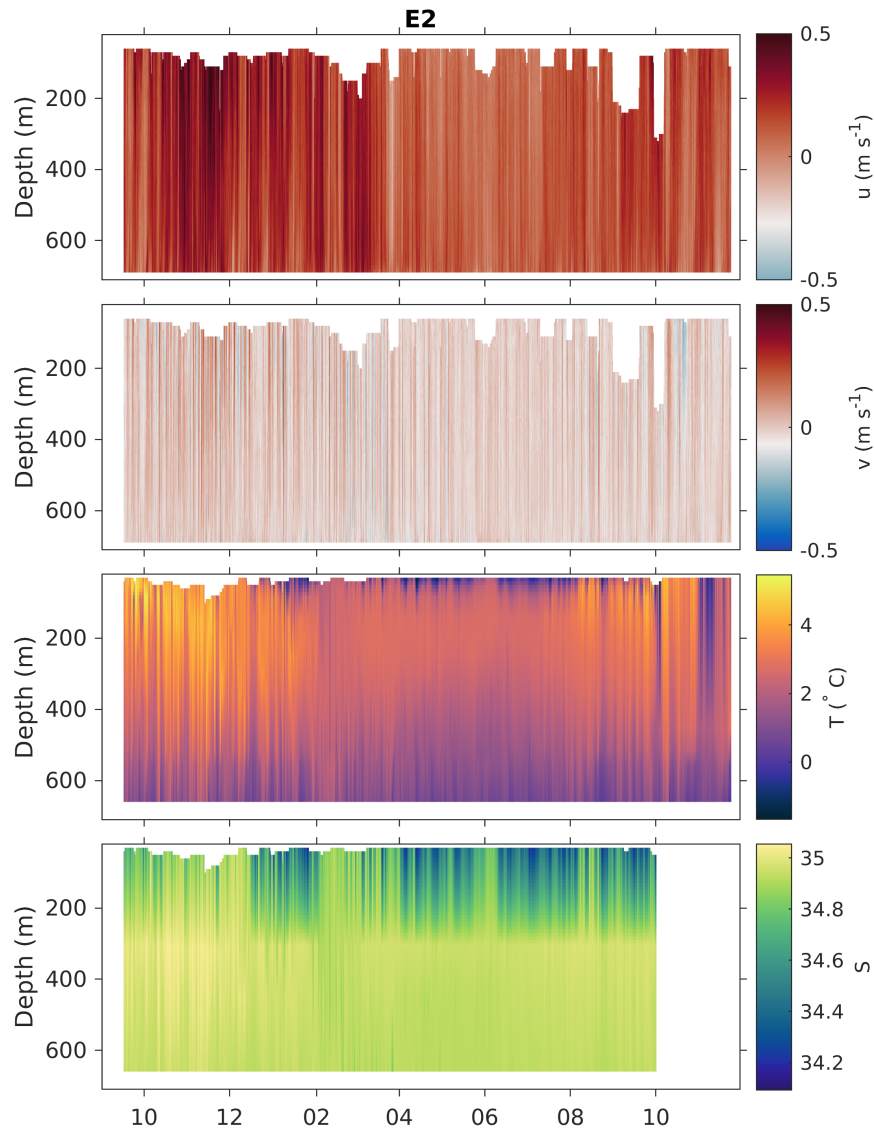


Figure 11: Same as figure 7 but for E2.

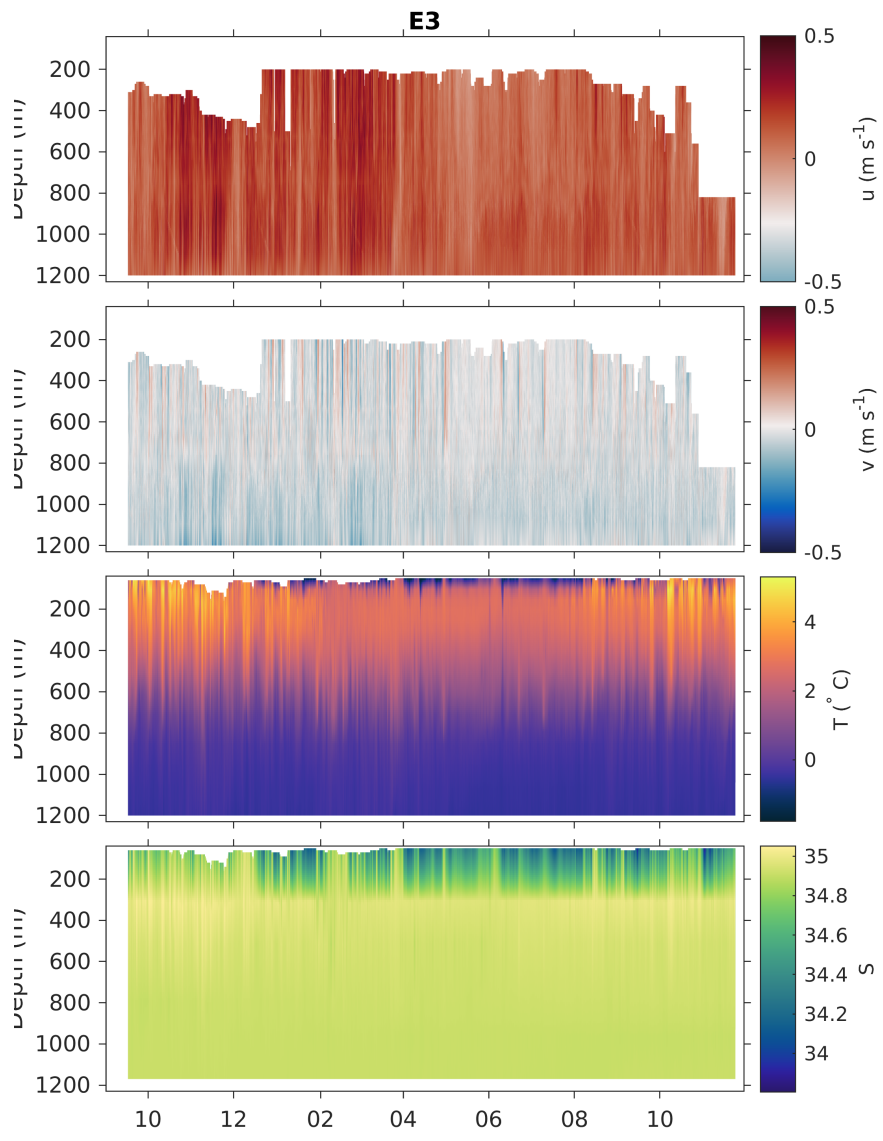


Figure 12: Same as figure 7 but for E3.

5.3 Time-averaged Profiles

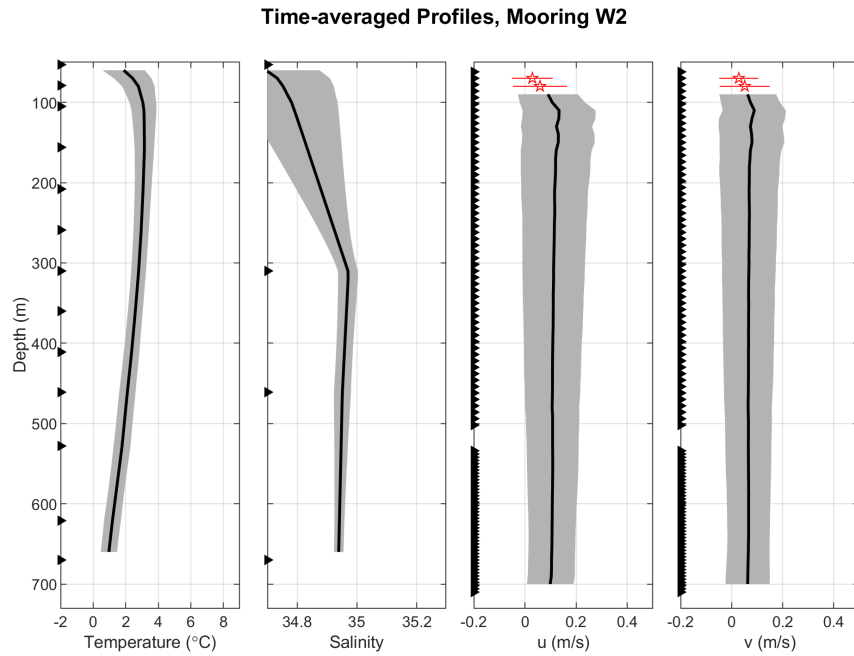


Figure 13: Time-averaged profiles from the gridded data. Mean (black) and one std (gray envelope) are shown. Measurement target depths are on the vertical axis. If the length of the record at a depth level is less than 80% of the total length, the data points is shown with a red pentagram.

Time-averaged Profiles, Mooring W3

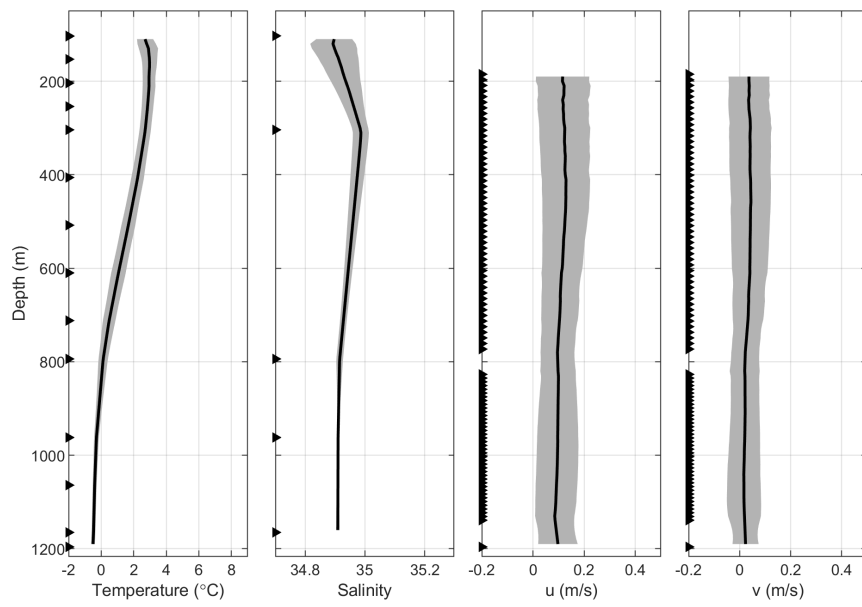


Figure 14: Same as figure 13 but for W3

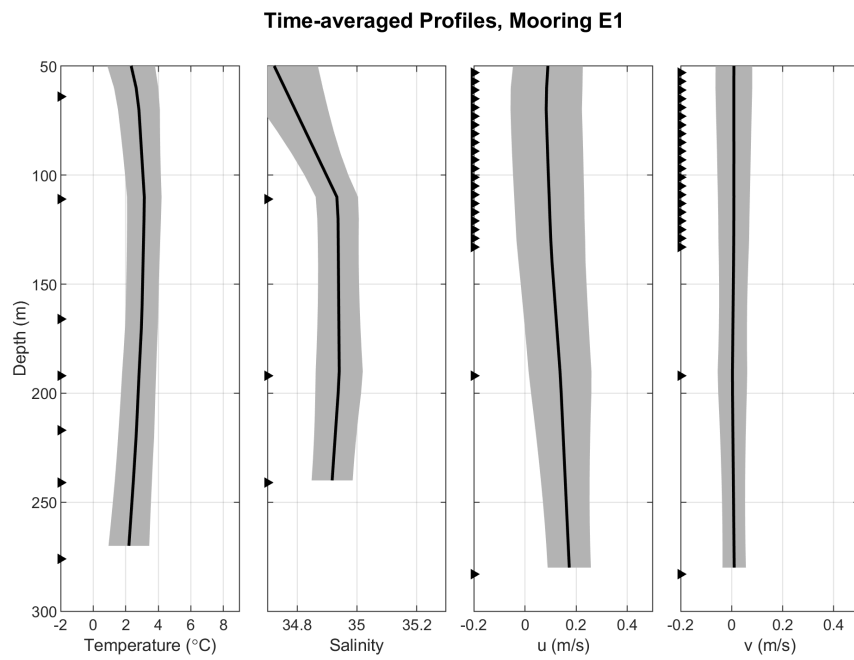


Figure 15: Same as figure 13 but for E1

Time-averaged Profiles, Mooring E2

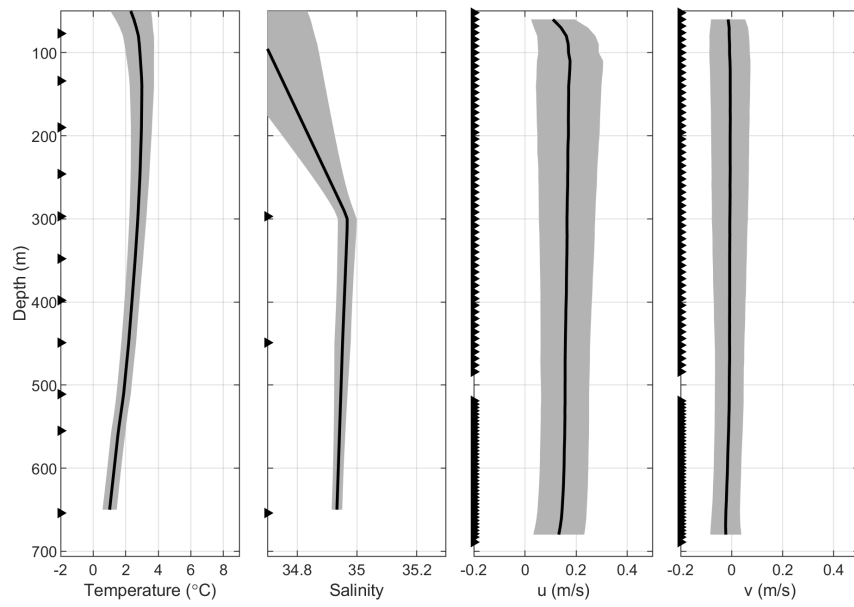


Figure 16: Same as figure 13 but for E2

Time-averaged Profiles, Mooring E3

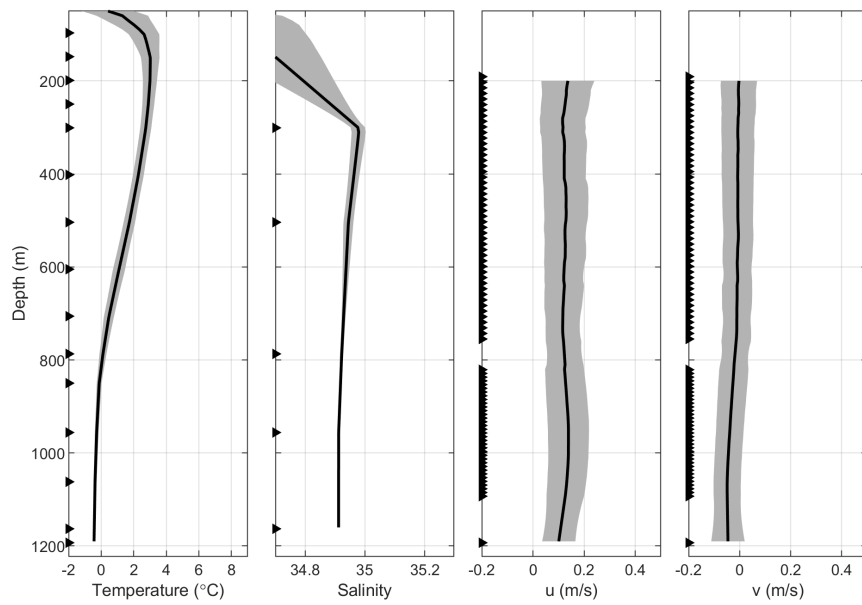


Figure 17: Same as figure 13 but for E3

6 Acknowledgements

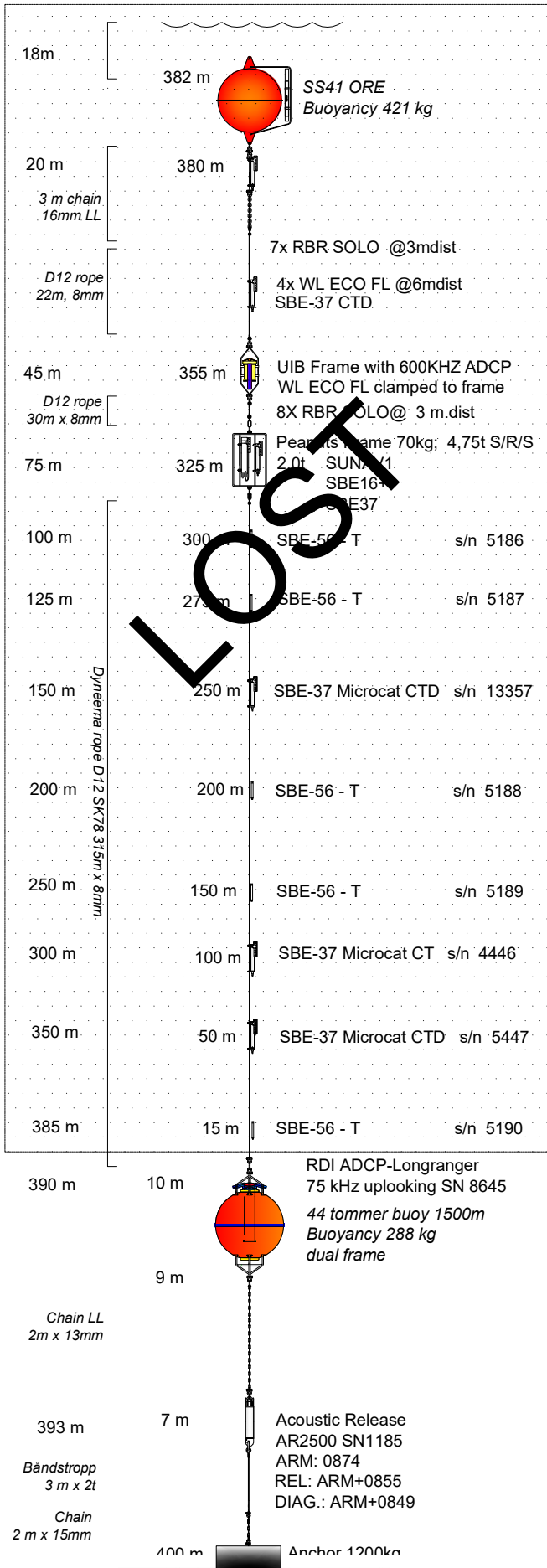
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References

- [1] I. Fer et al. *Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019*. 2022. DOI: 10.21335/NMDC-1852831792.
- [2] M. Jakobsson et al. “The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0”. In: *Geophys. Res. Lett.* 39, L12609 (2012). DOI: 10.1029/2012g1052219.

7 Appendices

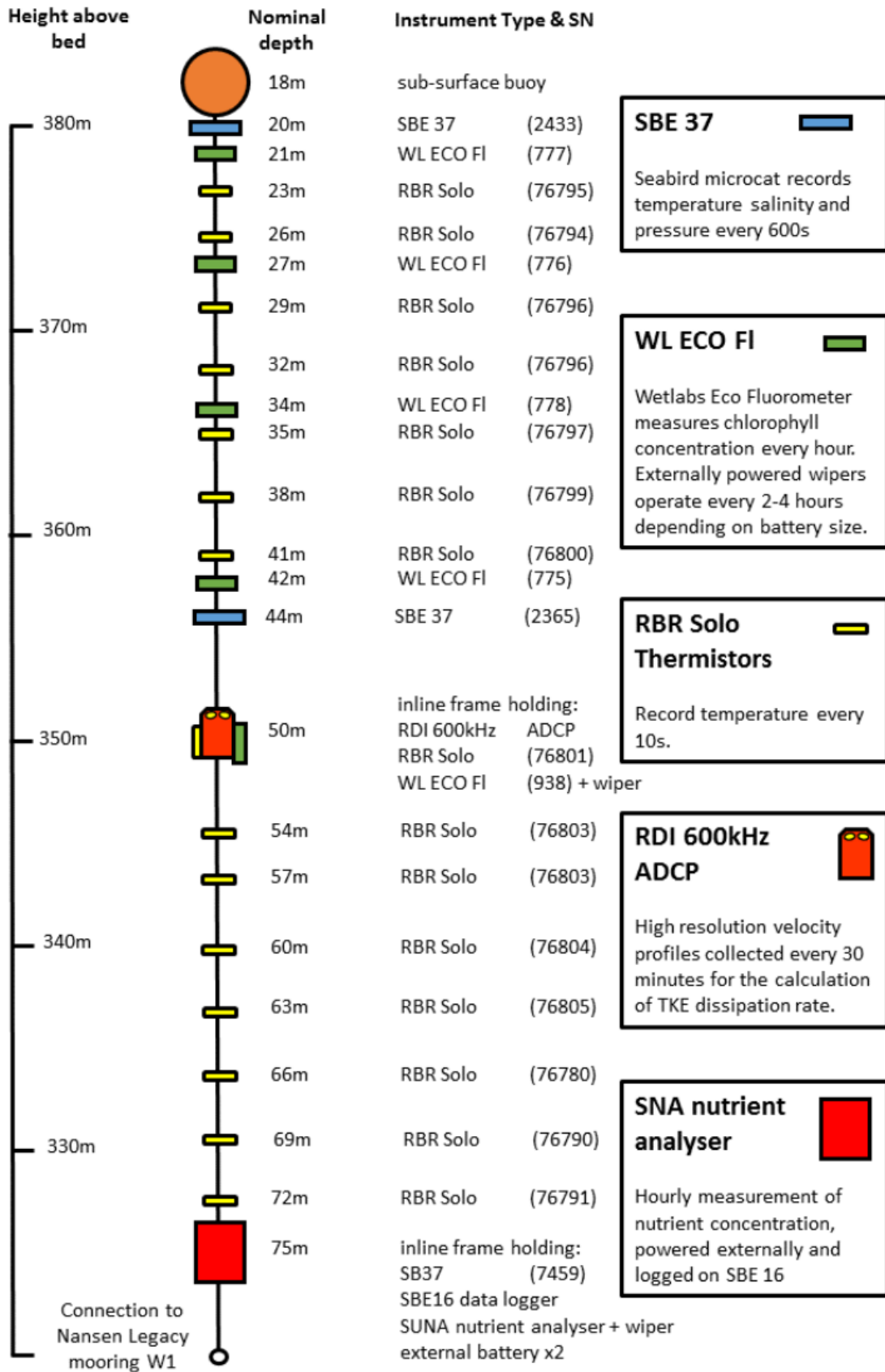
7.1 Mooring drawings

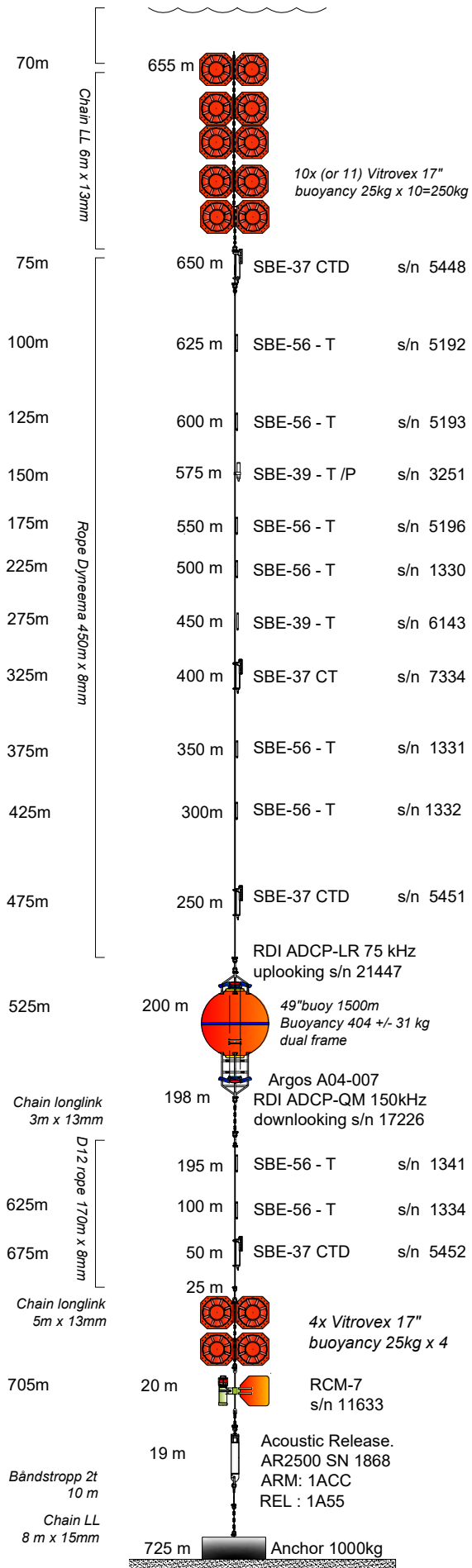


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Project: Arven etter Nansen
 Location: W1 Svalbard
 Position: Lat 81° 10.979' N
 Lon 18° 29.052' E
 Depth: 401m
 Deployed: 15 Sep 2018 18:19 UTC
 by RV Kronprins Haakon
 Recover: 21 Sep 2019 04:00 UTC
 by RV Kronprins Haakon

W1

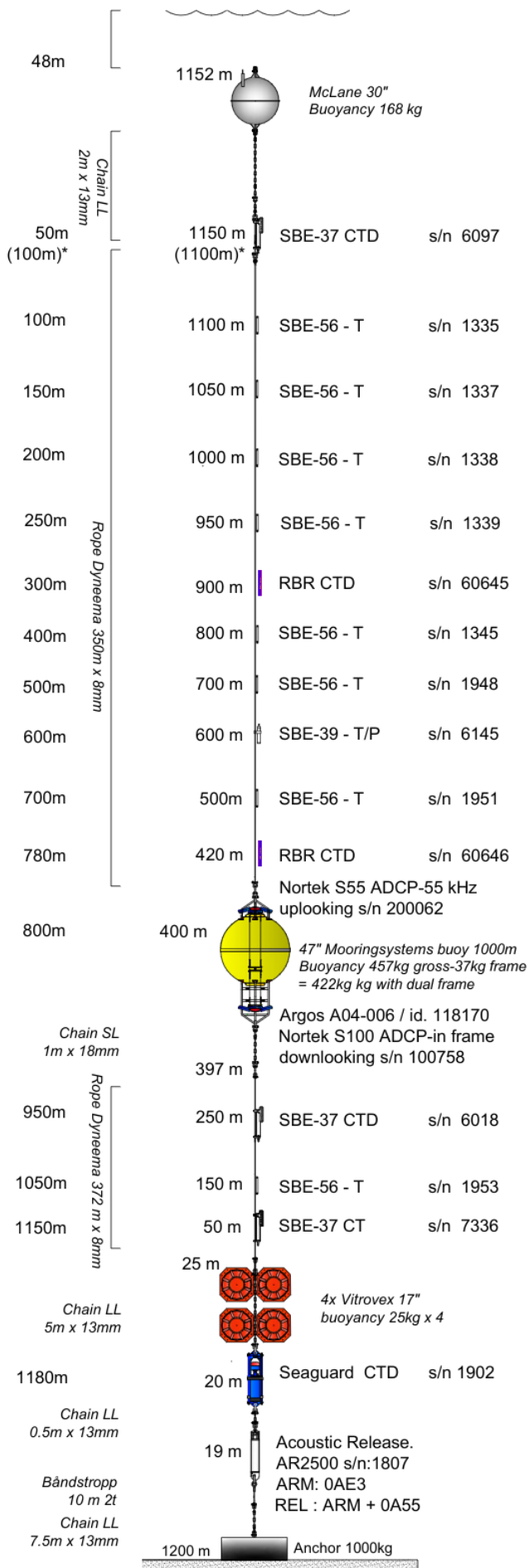




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Project: Arven etter Nansen
 Location: W2 Svalbard
 Position: Lat 81° 22.686' N
Lon 18° 23.789' E
 Depth: 730m
 Deployed: 15 Sep 2018 14:17 UTC
by RV Kronprins Haakon
 Recover: 21 Sep 2019 08:00 UTC
by RV Kronprins Haakon

W2



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Geofysisk Institutt

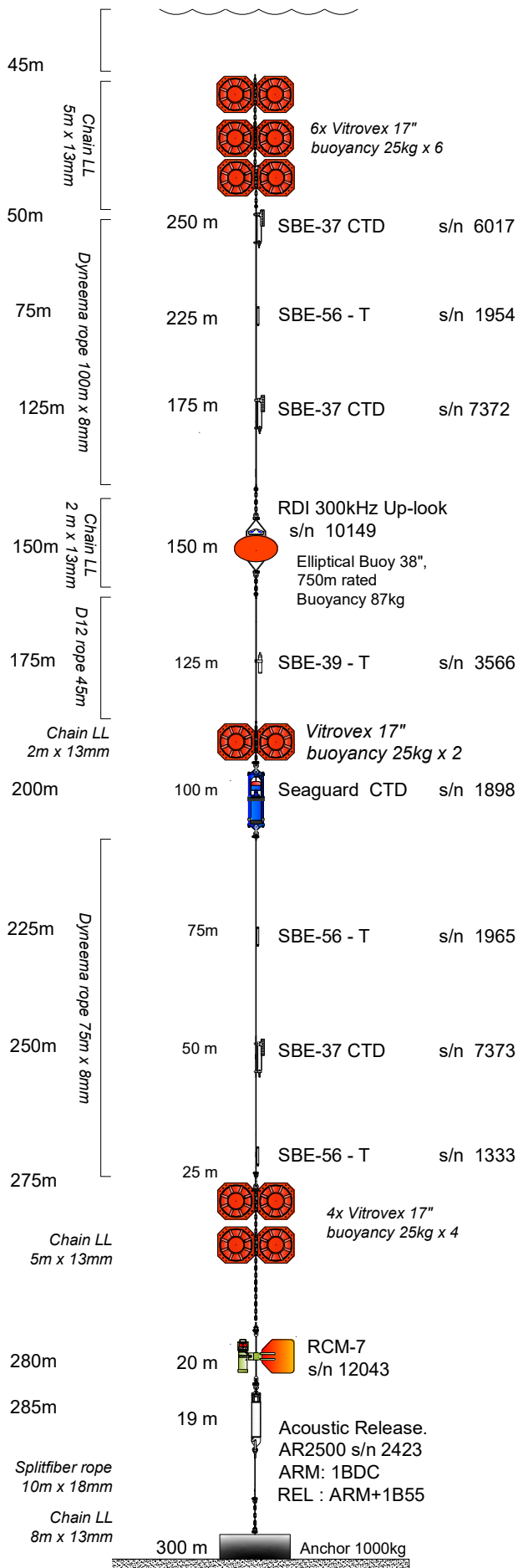
Project:	Arven etter Nansen
Location:	W3 Svalbard
Position:	Lat 81° 27.356' N
	Lon 18° 23.730' E
Depth:	1216m
Deployed:	20 Sep 2018 18:10 UTC
	by RV Kronprins Haakon
Recover:	21 Sep 2019 13:30 UTC
	by RV Kronprins Haakon

W3

Initially deployed on 15 Sep 2018, 09:15UTC
 In position: 81° 30.616' N
 18° 22.837' E
 Echo depth: 1885m

Top float imploded, and mooring was recovered on 20 Sep 2018 at 13:30 UTC. Mooring was redeployed at depth ~1200m on 20 Sep 2018 at 18:10 UTC.

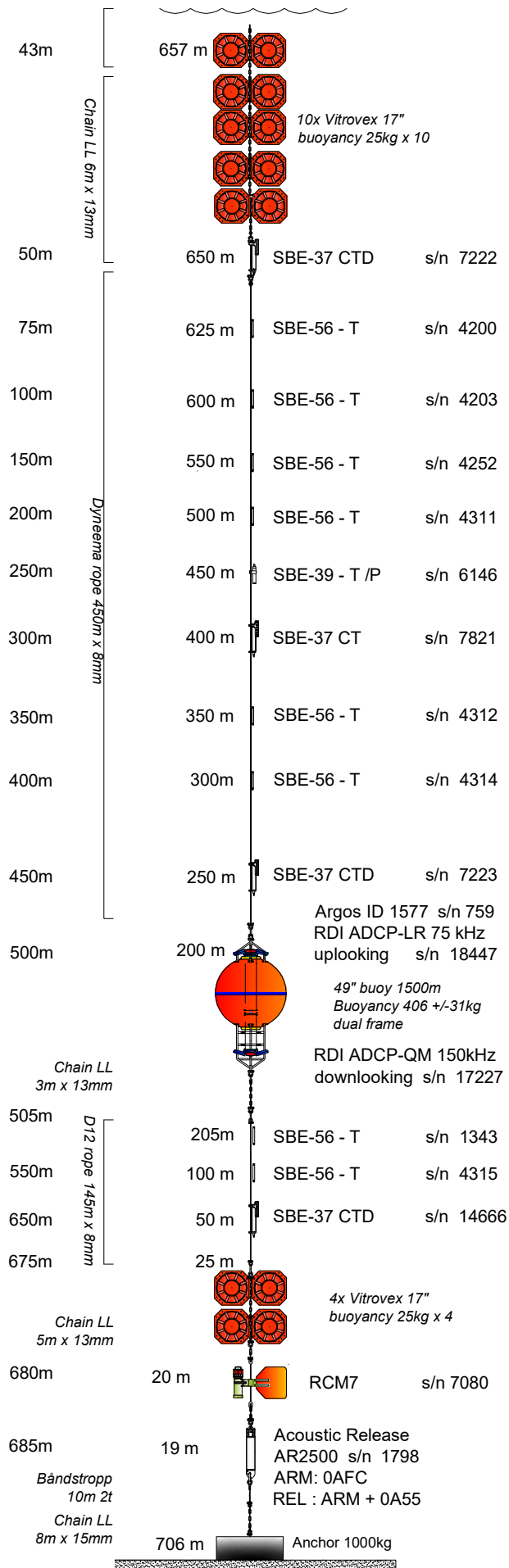
*SBE37 sn. 6097 slid down to 100m depth one week after deployment.



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Project: Arven etter Nansen
 Location: E1 Svalbard
 Position: Lat 81° 24.925' N
Lon 24° 00.000' E
 Depth: 300m
 Deployed: 16 Sep 2018 07:43 UTC
by RV Kronprins Haakon
 Recover: 23. Nov 2019 14:30 UTC
by RV Kronprins Haakon

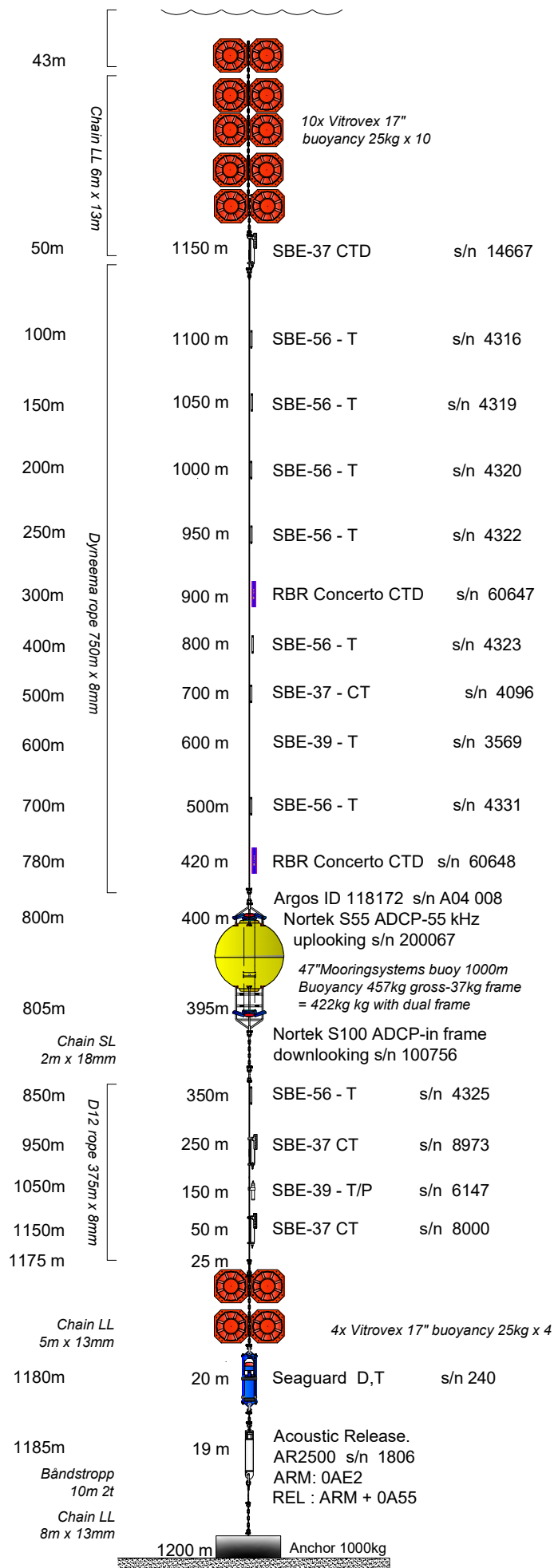
E1



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Project: Arven etter Nansen
 Location: E2 Svalbard
 Position: Lat 81° 30.813' N
 Lon 23° 59.853' E
 Depth: 706m
 Deployed: 16 Sep 2018 11:21 UTC
 by RV Kronprins Haakon
 Recover: 23 Nov 2019 19:04 UTC
 by RV Kronprins Haakon

E2



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Project:	Arven etter Nansen
Location:	E3 Svalbard
Position:	Lat 81° 35.453' N Lon 23° 59.982' E
Depth:	1222m
Deployed:	16 Sep 2018 14:45 UTC by RV Kronprins Haakon
Recover:	23 Nov 2019 21:50 UTC by RV Kronprins Haakon

E3

7.2 Metadata and attributes for each netCDF file (ncdisp output)


```

1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_E1.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the onshore mooring in the eastern array (E1), at 81.42 N, 24 E, at 300 m
21 water depth.
22
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of temperature, salinity and horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR, VCUR,
26 TEMP, PSAL). The second set as time series at time-variable measurement level because of mooring motion
27 (variables TEMP_ins, PRES_ins etc., with corresponding depth records zTEMP_ins, zPRES_ind and so on).
28 See the variable names for details. The dimensions follow the number of sensors on the mooring.
29 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
30 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
31 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
32
33 comment = 'Data from pressure sensors are used to correct for the mooring motion.
34 Magnetic declination (17degE) is corrected for. Gappy segments with record length less than 5 days
35 are filled with NaN in the gridded data set.
36 The initial accuracy of the SBE sensors are 2x10-3C for temperature, 3x10-4 S/m for
37 conductivity, and 1 dbar for pressure. The compass direction is accurate to 2deg.
38 Error estimates are 1 cm/s for velocity, 0.01C for temperature and 0.01 for practical salinity.
39 The distribution of the instruments on this mooring is as follows.
40 (Parameter legend: T=TEMP; S=PSAL; V=horizontal currents; P=PRES)
41 Target Depth (m) || Parameter || Instrument
42 40,111,241 || T, S, P || SBE37 6017, 7372, 7373
43 64,166,217,276 || T || SBE56 1954, SBE39 3566, SBE56 1965, 1333
44 139 || P || RDI 300kHz Workhorse Sentinel, SN10149
45 21:4:133 || V || --- upward pointing profile ---
46 192 || P, V, S, T || AADI SG SN1898
47 283 || P, V || AADI RCM-7, SN12043
48
49 Offset corrections applied to various sensors are described in the attached report.
50 Salinity records from the following instruments are corrected using constant salinity offsets:
51 SBE37 SN7372 : + 0.01
52 Seaguard SN1898 : -0.1
53 Direction of the currents were corrected using constant offset:
54 RCM-7 SN12043 : -25
55 RDI300 10149 : -10 '
56
57 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
58 creation_time = '2022-02-17T20:09:45Z'
59 date_update = '2022-02-17T20:09:45Z'
60 Conventions = 'CF-1.6, ACDD-1.3'
61 data_mode = 'D'
62 platform_type = 'mooring'
63 source = 'moored instruments'
64 area = 'Arctic Ocean, North of Svalbard'
65 latitude = 81.4154
66 longitude = 24
67 sea_floor_depth_below_sea_level = 300
68 geospatial_lat_min = 81.4154
69 geospatial_lat_max = 81.4154
70 geospatial_lon_min = 24
71 geospatial_lon_max = 24
72 time_coverage_start = '2018-09-16T09:00:00Z'
73 time_coverage_end = '2019-11-23T12:00:00Z'
74 institution = 'University of Bergen'
75 principal_investigator = 'Fer, Ilker'
76 principal_investigator_ORCID = '0000-0002-2427-2532'
77 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
78 contact = 'ilker.fer@uib.no'
79 project_name = 'The Nansen Legacy'
80 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
81 Atlantic Water properties, transport and variability from mooring observations
82 north of Svalbard., J. Geophys. Res. Oceans, submitted.
83
84 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
85 measurements from moorings north of Svalbard: September 2018 - November 2019,
86 Tech. Report, doi: 10.21335/NMDC-1075977612.'
87
88 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
89 creator_name = 'Ilker Fer'
90 creator_email = 'ilker.fer@uib.no'
91 creator_url = 'https://www.uib.no/gfi'
92 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
93 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
94 deployment and recovery cruises.'
95
96 date_created = '2022-02-17'
97 license = 'http://creativecommons.org/licenses/by/4.0/'
98 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
99 data from moorings north of Svalbard, September 2018 - September 2019
100 https://doi.org/10.21335/NMDC-1852831792'
101
102 Dimensions:
103 TIME = 10396
104 DEPTH = 26
105 ZP = 4
106 ZT = 8
107 ZS = 4
108 ZU = 31
109
110 Variables:
111 TIME
112 Size: 10396x1
113 Dimensions: TIME
114 Datatype: double
115 Attributes:
116 standard_name = 'time'
117 long_name = 'time of measurement'
118 units = 'days since 2018-01-01T00:00:00Z'
119 axis = 'T'
120
121 DEPTH
122 Size: 26x1
123 Dimensions: DEPTH
124 Datatype: double
125 Attributes:
126 standard_name = 'Z'
127 units = 'm'
128 long_name = 'vertical distance below the sea surface'
129 axis = 'Z'

```

```

119         positive      = 'down'
120     TEMP
121         Size:          26x10396
122         Dimensions:   DEPTH,TIME
123         Datatype:     double
124         Attributes:
125             standard_name = 'sea_water_temperature'
126             units         = 'degree_Celsius'
127             long_name     = 'sea water temperature in-situ ITS-90 scale'
128     PSAL
129         Size:          26x10396
130         Dimensions:   DEPTH,TIME
131         Datatype:     double
132         Attributes:
133             standard_name = 'sea_water_practical_salinity'
134             units         = '1'
135             long_name     = 'Practical salinity on the PSS-78 scale'
136     UCUR
137         Size:          26x10396
138         Dimensions:   DEPTH,TIME
139         Datatype:     double
140         Attributes:
141             standard_name = 'eastward_sea_water_velocity'
142             units         = 'm s-1'
143             long_name     = 'absolute eastward sea water velocity'
144     VCUR
145         Size:          26x10396
146         Dimensions:   DEPTH,TIME
147         Datatype:     double
148         Attributes:
149             standard_name = 'northward_sea_water_velocity'
150             units         = 'm s-1'
151             long_name     = 'absolute northward sea water velocity'
152     zPRES_ins
153         Size:          4x10396
154         Dimensions:   ZP,TIME
155         Datatype:     double
156         Attributes:
157             units         = 'm'
158             long_name     = 'vertical distance below sea surface of pressure sensor at time-varying measurement level (not gridded)'
159     zTEMP_ins
160         Size:          8x10396
161         Dimensions:   ZT,TIME
162         Datatype:     double
163         Attributes:
164             units         = 'm'
165             long_name     = 'vertical distance below sea surface of temperature sensor at time-varying measurement level (not gridded)'
166     zPSAL_ins
167         Size:          4x10396
168         Dimensions:   ZS,TIME
169         Datatype:     double
170         Attributes:
171             units         = 'm'
172             long_name     = 'vertical distance below sea surface of conductivity sensor at time-varying measurement level (not gridded)'
173     zUCUR_ins
174         Size:          31x10396
175         Dimensions:   ZU,TIME
176         Datatype:     double
177         Attributes:
178             units         = 'm'
179             long_name     = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
180     PRES_ins
181         Size:          4x10396
182         Dimensions:   ZP,TIME
183         Datatype:     double
184         Attributes:
185             units         = 'decibar'
186             long_name     = 'sea water pressure at time-varying measurement level (not gridded), equals 0 at sea-level'
187     TEMP_ins
188         Size:          8x10396
189         Dimensions:   ZT,TIME
190         Datatype:     double
191         Attributes:
192             units         = 'degree_Celsius'
193             long_name     = 'sea water temperature at time-varying measurement level (not gridded), in-situ ITS-90 scale'
194     PSAL_ins
195         Size:          4x10396
196         Dimensions:   ZS,TIME
197         Datatype:     double
198         Attributes:
199             units         = '1'
200             long_name     = 'practical salinity at time-varying measurement level (not gridded), PSS-78 scale'
201     UCUR_ins
202         Size:          31x10396
203         Dimensions:   ZU,TIME
204         Datatype:     double
205         Attributes:
206             units         = 'm s-1'
207             long_name     = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
208     VCUR_ins
209         Size:          31x10396
210         Dimensions:   ZU,TIME
211         Datatype:     double
212         Attributes:
213             units         = 'm s-1'
214             long_name     = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
215     >>

```

```

1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_E2.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the middle mooring in the eastern array (E2), at 81.51 N, 23.998 E, at 706 m
21 water depth.
22
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of temperature, salinity and horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR, VCUR,
26 TEMP, PSAL). The second set as time series at time-variable measurement level because of mooring motion
27 (variables TEMP_ins, PRES_ins etc., with corresponding depth records zTEMP_ins, zPRES_ind and so on).
28 See the variable names for details. The dimensions follow the number of sensors on the mooring.
29 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
30 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
31 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
32
33 comment = 'Data from pressure sensors are used to correct for the mooring motion.
34 Magnetic declination (17degE) is corrected for. Gappy segments with record length less than 5 days
35 are filled with NaN in the gridded data set.
36 The initial accuracy of the SBE sensors are 2x10-3C for temperature, 3x10-4 S/m for
37 conductivity, and 1 dbar for pressure. The compass direction is accurate to 2deg.
38 Error estimates are 1 cm/s for velocity, 0.01C for temperature and 0.01 for practical salinity.
39 The distribution of the instruments on this mooring is as follows.
40 (Parameter legend: T=TEMP; S=PSAL; V=horizontal currents; P=PRES)
41 Target Depth (m) || Parameter || Instrument
42 21,449,654 || T, S, P || SBE37 7222, 7223, 14666
43 246 || T, P || SBE39 6146
44 297 || T, S || SBE37 7821
45 49, 77, 134 || T || SBE56 4200, 4203, 4252
46 190,348,398 || T || SBE56 4311, 4312, 4314
47 511, 555 || T || SBE56 1343, 4315
48 505 || P || RDI 75kHz Longranger, SN18447
49 52:8:484 || V || --- upward pointing profile ---
50 510 || P || RDI 150kHz Quartermaster, SN17227
51 519:4:689 || V || --- downward pointing profile ---
52 710 || P, V || RCM-7, SN7080
53
54 Offset corrections applied to various sensors are described in the attached report.
55 Some microcats required corrections with the following constant salinity offsets:
56 SBE37 SN7821 : + 0.005
57 SBE37 SN7223 : + 0.005
58 SBE37 SN14666 : + 0.005
59
60 Temperature of SN4315 required correction with the constant temperature offset: +0.25
61
62 Direction of the RCM7 SN7080 was corrected by -27
63 RDI150 SN17227 direction measurements were adjusted to the direction
64 of the last/first bin of the RDI75 SN18447 respectively.'
65
66 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
67 creation_time = '2022-02-17T20:12:24Z'
68 date_update = '2022-02-17T20:12:24Z'
69 Conventions = 'CF-1.6, ACDD-1.3'
70 data_mode = 'D'
71 platform_type = 'mooring'
72 source = 'moored instruments'
73 area = 'Arctic Ocean, North of Svalbard'
74 latitude = 81.5135
75 longitude = 23.9976
76 sea_floor_depth_below_sea_level = 706
77 geospatial_lat_min = 81.5135
78 geospatial_lat_max = 81.5135
79 geospatial_lon_min = 23.9976
80 geospatial_lon_max = 23.9976
81 time_coverage_start = '2018-09-16T12:30:00Z'
82 time_coverage_end = '2019-11-23T16:30:00Z'
83 institution = 'University of Bergen'
84 principal_investigator = 'Fer, Ilker'
85 principal_investigator_ORCID = '0000-0002-2427-2532'
86 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
87 contact = 'ilker.fer@uib.no'
88 project_name = 'The Nansen Legacy'
89 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
90 Atlantic Water properties, transport and variability from mooring observations
91 north of Svalbard., J. Geophys. Res. Oceans, submitted.
92
93 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
94 measurements from moorings north of Svalbard: September 2018 - November 2019,
95 Tech. Report, doi: 10.21335/NMDC-1075977612.'
96
97 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
98 creator_name = 'Ilker Fer'
99 creator_email = 'ilker.fer@uib.no'
100 creator_url = 'https://www.uib.no/gfi'
101 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
102 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
103 deployment and recovery cruises.'
104
105 date_created = '2022-02-17'
106 license = 'http://creativecommons.org/licenses/by/4.0/'
107 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
108 data from moorings north of Svalbard, September 2018 - September 2019
109 https://doi.org/10.21335/NMDC-1852831792'
110
111 Dimensions:
112 TIME = 10397
113 DEPTH = 66
114 ZP = 4
115 ZT = 13
116 ZS = 4
117 ZU = 98
118
119 Variables:
120 TIME
121 Size: 10397x1
122 Dimensions: TIME
123 Datatype: double
124 Attributes:
125 standard_name = 'time'
126 long_name = 'time of measurement'
127 units = 'days since 2018-01-01T00:00:00Z'
128 axis = 'T'

```

```

119 DEPTH
120   Size:      66x1
121   Dimensions: DEPTH
122   Datatype:  double
123   Attributes:
124             standard_name = 'Z'
125             units         = 'm'
126             long_name     = 'vertical distance below the sea surface'
127             axis         = 'Z'
128             positive      = 'down'
129
130 TEMP
131   Size:      66x10397
132   Dimensions: DEPTH,TIME
133   Datatype:  double
134   Attributes:
135             standard_name = 'sea_water_temperature'
136             units         = 'degree_Celsius'
137             long_name     = 'sea water temperature in-situ ITS-90 scale'
138
139 PSAL
140   Size:      66x10397
141   Dimensions: DEPTH,TIME
142   Datatype:  double
143   Attributes:
144             standard_name = 'sea_water_practical_salinity'
145             units         = '1'
146             long_name     = 'Practical salinity on the PSS-78 scale'
147
148 UCUR
149   Size:      66x10397
150   Dimensions: DEPTH,TIME
151   Datatype:  double
152   Attributes:
153             standard_name = 'eastward_sea_water_velocity'
154             units         = 'm s-1'
155             long_name     = 'absolute eastward sea water velocity'
156
157 VCUR
158   Size:      66x10397
159   Dimensions: DEPTH,TIME
160   Datatype:  double
161   Attributes:
162             standard_name = 'northward_sea_water_velocity'
163             units         = 'm s-1'
164             long_name     = 'absolute northward sea water velocity'
165
166 zPRES_ins
167   Size:      4x10397
168   Dimensions: ZP,TIME
169   Datatype:  double
170   Attributes:
171             units         = 'm'
172             long_name     = 'vertical distance below sea surface of pressure sensor at time-varying measurement level (not gridded)'
173
174 zTEMP_ins
175   Size:      13x10397
176   Dimensions: ZT,TIME
177   Datatype:  double
178   Attributes:
179             units         = 'm'
180             long_name     = 'vertical distance below sea surface of temperature sensor at time-varying measurement level (not gridded)'
181
182 zPSAL_ins
183   Size:      4x10397
184   Dimensions: ZS,TIME
185   Datatype:  double
186   Attributes:
187             units         = 'm'
188             long_name     = 'vertical distance below sea surface of conductivity sensor at time-varying measurement level (not gridded)'
189
190 zUCUR_ins
191   Size:      98x10397
192   Dimensions: ZU,TIME
193   Datatype:  double
194   Attributes:
195             units         = 'm'
196             long_name     = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
197
198 PRES_ins
199   Size:      4x10397
200   Dimensions: ZP,TIME
201   Datatype:  double
202   Attributes:
203             units         = 'decibar'
204             long_name     = 'sea water pressure at time-varying measurement level (not gridded), equals 0 at sea-level'
205
206 TEMP_ins
207   Size:      13x10397
208   Dimensions: ZT,TIME
209   Datatype:  double
210   Attributes:
211             units         = 'degree_Celsius'
212             long_name     = 'sea water temperature at time-varying measurement level (not gridded), in-situ ITS-90 scale'
213
214 PSAL_ins
215   Size:      4x10397
216   Dimensions: ZS,TIME
217   Datatype:  double
218   Attributes:
219             units         = '1'
220             long_name     = 'practical salinity at time-varying measurement level (not gridded), PSS-78 scale'
221
222 UCUR_ins
223   Size:      98x10397
224   Dimensions: ZU,TIME
225   Datatype:  double
226   Attributes:
227             units         = 'm s-1'
228             long_name     = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
229
230 VCUR_ins
231   Size:      98x10397
232   Dimensions: ZU,TIME
233   Datatype:  double
234   Attributes:
235             units         = 'm s-1'
236             long_name     = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
237
238 >>

```

```

1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_E3.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the offshore mooring in the eastern array (E3), at 81.59 N, 24.00 E, at 1222 m
21 water depth.
22
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of temperature, salinity and horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR, VCUR,
26 TEMP, PSAL). The second set as time series at time-variable measurement level because of mooring motion
27 (variables TEMP_ins, PRES_ins etc., with corresponding depth records zTEMP_ins, zPRES_ins and so on).
28 See the variable names for details. The dimensions follow the number of sensors on the mooring.
29 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
30 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
31 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
32
33 comment = 'Data from pressure sensors are used to correct for the mooring motion.
34 Magnetic declination (17degE) is corrected for. Gappy segments with record length less than 5 days
35 are filled with NaN in the gridded data set.
36 The initial accuracy of the SBE sensors are 2x10-3C for temperature, 3x10-4 S/m for
37 conductivity, and 1 dbar for pressure. The compass direction is accurate to 2deg.
38 Error estimates are 1 cm/s for velocity, 0.01C for temperature and 0.01 for practical salinity.
39 The distribution of the instruments on this mooring is as follows.
40 (Parameter legend: T=TEMP; S=PSAL; V=horizontal currents; P=PRES)
41 Target Depth (m) || Parameter || Instrument
42 46, 30L, 787 || T, S, P || SBE37 14667, RBR 60647, RBR 60648
43 504, 956, 1163 || T, S || SBE37 4096, 8973, 8000
44 1062 || T, P || SBE39 6147
45 97, 148, 199 || T || SBE56 4316, 4319, 4320
46 250, 402, 605 || T || SBE56 4322, 4323, SBE39 3569
47 706, 850, || T || SBE56 4331, 4325
48 812 || P || Nortek S55, SN200067
49 185:12:773 || V || --- upward pointing profile ---
50 814 || P || Nortek S100, SN100756
51 827:8:1139 || V || --- downward pointing profile ---
52 1193 || T, P, V || AADI SG SN240
53
54 Offset corrections applied to various sensors are described in the attached report.
55 Some SBE37 or RBR CTDs required corrections with the following constant salinity offsets:
56 SN60647: -0.02
57 SN4096 : 0.02
58 SN60648: 0.008
59 SN8000 : 0.008
60
61 Salinity from AADI SG SN1902 is not used. The SG SN1902 velocity direction was corrected by +5 degrees.
62
63
64 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
65 creation_time = '2022-02-17T20:13:17Z'
66 date_update = '2022-02-17T20:13:17Z'
67 Conventions = 'CF-1.6, ACDD-1.3'
68 data_mode = 'D'
69 platform_type = 'mooring'
70 source = 'moored instruments'
71 area = 'Arctic Ocean, North of Svalbard'
72 latitude = 81.5909
73 longitude = 23.9997
74 sea_floor_depth_below_sea_level = 1222
75 geospatial_lat_min = 81.5909
76 geospatial_lat_max = 81.5909
77 geospatial_lon_min = 23.9997
78 geospatial_lon_max = 23.9997
79 time_coverage_start = '2018-09-16T18:00:00Z'
80 time_coverage_end = '2019-11-23T20:00:00Z'
81 institution = 'University of Bergen'
82 principal_investigator = 'Fer, Ilker'
83 principal_investigator_ORCID = '0000-0002-2427-2532'
84 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
85 contact = 'ilker.fer@uib.no'
86 project_name = 'The Nansen Legacy'
87 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
88 Atlantic Water properties, transport and variability from mooring observations
89 north of Svalbard., J. Geophys. Res. Oceans, submitted.
90
91 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
92 measurements from moorings north of Svalbard: September 2018 - November 2019,
93 Tech. Report, doi: 10.21335/NMDC-1075977612.'
94
95 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
96 creator_name = 'Ilker Fer'
97 creator_email = 'ilker.fer@uib.no'
98 creator_url = 'https://www.uib.no/gfi'
99 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
100 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
101 deployment and recovery cruises.'
102
103 date_created = '2022-02-17'
104 license = 'http://creativecommons.org/licenses/by/4.0/'
105 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
106 data from moorings north of Svalbard, September 2018 - September 2019
107 https://doi.org/10.21335/NMDC-1852831792'
108
109 Dimensions:
110 TIME = 10395
111 DEPTH = 115
112 ZP = 5
113 ZT = 16
114 ZS = 6
115 ZU = 84
116
117 Variables:
118 TIME
119 Size: 10395x1
120 Dimensions: TIME
121 Datatype: double
122 Attributes:
123 standard_name = 'time'
124 long_name = 'time of measurement'
125 units = 'days since 2018-01-01T00:00:00Z'
126 axis = 'T'
127
128 DEPTH
129 Size: 115x1
130 Dimensions: DEPTH
131 Datatype: double

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119     Attributes:
120         standard_name = 'Z'
121         units          = 'm'
122         long_name     = 'vertical distance below the sea surface'
123         axis          = 'Z'
124         positive      = 'down'
125
126     TEMP
127     Size:          115x10395
128     Dimensions:   DEPTH, TIME
129     Datatype:     double
130     Attributes:
131         standard_name = 'sea_water_temperature'
132         units          = 'degree_Celsius'
133         long_name     = 'sea water temperature in-situ ITS-90 scale'
134
135     PSAL
136     Size:          115x10395
137     Dimensions:   DEPTH, TIME
138     Datatype:     double
139     Attributes:
140         standard_name = 'sea_water_practical_salinity'
141         units          = '1'
142         long_name     = 'Practical salinity on the PSS-78 scale'
143
144     UCUR
145     Size:          115x10395
146     Dimensions:   DEPTH, TIME
147     Datatype:     double
148     Attributes:
149         standard_name = 'eastward_sea_water_velocity'
150         units          = 'm s-1'
151         long_name     = 'absolute eastward sea water velocity'
152
153     VCUR
154     Size:          115x10395
155     Dimensions:   DEPTH, TIME
156     Datatype:     double
157     Attributes:
158         standard_name = 'northward_sea_water_velocity'
159         units          = 'm s-1'
160         long_name     = 'absolute northward sea water velocity'
161
162     zPRES_ins
163     Size:          5x10395
164     Dimensions:   ZP, TIME
165     Datatype:     double
166     Attributes:
167         units          = 'm'
168         long_name     = 'vertical distance below sea surface of pressure sensor at time-varying measurement level (not gridded)'
169
170     zTEMP_ins
171     Size:          16x10395
172     Dimensions:   ZT, TIME
173     Datatype:     double
174     Attributes:
175         units          = 'm'
176         long_name     = 'vertical distance below sea surface of temperature sensor at time-varying measurement level (not gridded)'
177
178     zPSAL_ins
179     Size:          6x10395
180     Dimensions:   ZS, TIME
181     Datatype:     double
182     Attributes:
183         units          = 'm'
184         long_name     = 'vertical distance below sea surface of conductivity sensor at time-varying measurement level (not gridded)'
185
186     zUCUR_ins
187     Size:          84x10395
188     Dimensions:   ZU, TIME
189     Datatype:     double
190     Attributes:
191         units          = 'm'
192         long_name     = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
193
194     PRES_ins
195     Size:          5x10395
196     Dimensions:   ZP, TIME
197     Datatype:     double
198     Attributes:
199         units          = 'decibar'
200         long_name     = 'sea water pressure at time-varying measurement level (not gridded), equals 0 at sea-level'
201
202     TEMP_ins
203     Size:          16x10395
204     Dimensions:   ZT, TIME
205     Datatype:     double
206     Attributes:
207         units          = 'degree_Celsius'
208         long_name     = 'sea water temperature at time-varying measurement level (not gridded), in-situ ITS-90 scale'
209
210     PSAL_ins
211     Size:          6x10395
212     Dimensions:   ZS, TIME
213     Datatype:     double
214     Attributes:
215         units          = '1'
216         long_name     = 'practical salinity at time-varying measurement level (not gridded), PSS-78 scale'
217
218     UCUR_ins
219     Size:          84x10395
220     Dimensions:   ZU, TIME
221     Datatype:     double
222     Attributes:
223         units          = 'm s-1'
224         long_name     = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
225
226     VCUR_ins
227     Size:          84x10395
228     Dimensions:   ZU, TIME
229     Datatype:     double
230     Attributes:
231         units          = 'm s-1'
232         long_name     = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
233
234 >>

```

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1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_W1.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the onshore mooring in the western array (W1), at 81.18 N, 18.49 E, at 401 m
21 water depth.
22 The hydrography part of the mooring line was lost and only the ADCP was recovered.
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR and
26 VCUR).
27 The second set as time series at time-variable measurement level because of mooring motion
28 (variables UCUR_ins and VCUR_ins), with corresponding depth records zUCUR_ins.
29 See the variable names for details. The dimensions follow the number of sensors on the mooring.
30 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
31 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
32 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
33
34 comment = 'Data from pressure sensors are used to correct for the mooring motion.
35 Magnetic declination (13degE) is corrected for. Gappy segments with record length less than 5 days
36 are filled with NaN in the gridded data set.
37 Error estimates are 1 cm/s for velocity and 2dec for direction.
38 This mooring is only composed of one RDI 75kHz Longranger SN 8645
39 at 390m depth. The upper line with the hydrographic instruments
40 was lost
41 '
42
43 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
44 creation_time = '2022-02-17T20:14:10Z'
45 date_update = '2022-02-17T20:14:10Z'
46 Conventions = 'CF-1.6, ACDD-1.3'
47 data_mode = 'D'
48 platform_type = 'mooring'
49 source = 'moored instruments'
50 area = 'Arctic Ocean, North of Svalbard'
51 latitude = 81.183
52 longitude = 18.4842
53 sea_floor_depth_below_sea_level = 401
54 geospatial_lat_min = 81.183
55 geospatial_lat_max = 81.183
56 geospatial_lon_min = 18.4842
57 geospatial_lon_max = 18.4842
58 time_coverage_start = '2018-09-15T19:30:00Z'
59 time_coverage_end = '2019-09-17T23:30:00Z'
60 institution = 'University of Bergen'
61 principal_investigator = 'Fer, Ilker'
62 principal_investigator_ORCID = '0000-0002-2427-2532'
63 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
64 contact = 'ilker.fer@uib.no'
65 project_name = 'The Nansen Legacy'
66 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
67 Atlantic Water properties, transport and variability from mooring observations
68 north of Svalbard., J. Geophys. Res. Oceans, submitted.
69
70 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
71 measurements from moorings north of Svalbard: September 2018 - November 2019,
72 Tech. Report, doi: 10.21335/NMDC-1075977612.'
73
74 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
75 creator_name = 'Ilker Fer'
76 creator_email = 'ilker.fer@uib.no'
77 creator_url = 'https://www.uib.no/gfi'
78 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
79 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
80 deployment and recovery cruises.'
81
82 date_created = '2022-02-17'
83 license = 'http://creativecommons.org/licenses/by/4.0/'
84 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
85 data from moorings north of Svalbard, September 2018 - September 2019
86 https://doi.org/10.21335/NMDC-1852831792'
87
88 Dimensions:
89 TIME = 8813
90 DEPTH = 34
91 ZU = 43
92
93 Variables:
94 TIME
95 Size: 8813x1
96 Dimensions: TIME
97 Datatype: double
98 Attributes:
99 standard_name = 'time'
100 long_name = 'time of measurement'
101 units = 'days since 2018-01-01T00:00:00Z'
102 axis = 'T'
103
104 DEPTH
105 Size: 34x1
106 Dimensions: DEPTH
107 Datatype: double
108 Attributes:
109 standard_name = 'Z'
110 units = 'm'
111 long_name = 'vertical distance below the sea surface'
112 axis = 'Z'
113 positive = 'down'
114
115 UCUR
116 Size: 34x8813
117 Dimensions: DEPTH, TIME
118 Datatype: double
119 Attributes:
120 standard_name = 'eastward_sea_water_velocity'
121 units = 'm s-1'
122 long_name = 'absolute eastward sea water velocity'
123
124 VCUR
125 Size: 34x8813
126 Dimensions: DEPTH, TIME
127 Datatype: double
128 Attributes:
129 standard_name = 'northward_sea_water_velocity'
130 units = 'm s-1'
131 long_name = 'absolute northward sea water velocity'

```

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118 zUCUR_ins
119     Size:      43x8813
120     Dimensions: ZU,TIME
121     Datatype:  double
122     Attributes:
123         units      = 'm'
124         long_name = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
125
126 UCUR_ins
127     Size:      43x8813
128     Dimensions: ZU,TIME
129     Datatype:  double
130     Attributes:
131         units      = 'm s-1'
132         long_name = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
133
134 VCUR_ins
135     Size:      43x8813
136     Dimensions: ZU,TIME
137     Datatype:  double
138     Attributes:
139         units      = 'm s-1'
140         long_name = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
141
142 >>
```



```

1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_W2.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the middle mooring in the western array (W2), at 81.38 N, 18.397 E, at 730 m
21 water depth.
22
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of temperature, salinity and horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR, VCUR,
26 TEMP, PSAL). The second set as time series at time-variable measurement level because of mooring motion
27 (variables TEMP_ins, PRES_ins etc., with corresponding depth records zTEMP_ins, zPRES_ins and so on).
28 See the variable names for details. The dimensions follow the number of sensors on the mooring.
29 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
30 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
31 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
32
33 comment = 'Data from pressure sensors are used to correct for the mooring motion.
34 Magnetic declination (13degE) is corrected for. Gappy segments with record length less than 5 days
35 are filled with NaN in the gridded data set.
36 The initial accuracy of the SBE sensors are 2x10-3C for temperature, 3x10-4 S/m for
37 conductivity, and 1 dbar for pressure. The compass direction is accurate to 2deg.
38 Error estimates are 1 cm/s for velocity, 0.01C for temperature and 0.01 for practical salinity.
39 The distribution of the instruments on this mooring is as follows.
40 (Parameter legend: T=TEMP; S=PSAL; V=horizontal currents; P=PRES)
41 Target Depth (m) || Parameter || Instrument
42 53, 461, 670 || T, S, P || SBE37 544B, 5451, 5452
43 310 || T, S || SBE37 7334
44 79,105,156,208 || T || SBE56 5192, 5193, 5196, 1330
45 259, 360, 411 || T || SBE56 6143, 1331, 1332
46 528, 621 || T || SBE56 1341, 1334
47 523 || P || RDI 75kHz Longranger, SN21447
48 62:8:502 || V || --- upward pointing profile ---
49 525 || P || RDI 150kHz Quartermaster, SN17226
50 538:4:710 || V || --- downward pointing profile ---
51 710 || P, V || AADI RCM-7, SN11633
52
53 Offset corrections applied to various sensors are described in the attached report.
54 Salinity record from the SBE37 SN5452 was corrected with a constant salinity offset +0.015.
55 The RCM7 SN11633 and RDI 75kHz SN21447 compass (direction measurements) were adjusted to
56 the direction of the last/first bin of the RDI150kHz SN17226 respectively.
57
58 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
59 creation_time = '2022-02-17T20:14:43Z'
60 date_update = '2022-02-17T20:14:43Z'
61 Conventions = 'CF-1.6, ACDD-1.3'
62 data_mode = 'D'
63 platform_type = 'mooring'
64 source = 'moored instruments'
65 area = 'Arctic Ocean, North of Svalbard'
66 latitude = 81.3781
67 longitude = 18.3965
68 sea_floor_depth_below_sea_level = 730
69 geospatial_lat_min = 81.3781
70 geospatial_lat_max = 81.3781
71 geospatial_lon_min = 18.3965
72 geospatial_lon_max = 18.3965
73 time_coverage_start = '2018-09-15T16:00:00Z'
74 time_coverage_end = '2019-09-21T07:00:00Z'
75 institution = 'University of Bergen'
76 principal_investigator = 'Fer, Ilker'
77 principal_investigator_ORCID = '0000-0002-2427-2532'
78 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
79 contact = 'ilker.fer@uib.no'
80 project_name = 'The Nansen Legacy'
81 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
82 Atlantic Water properties, transport and variability from mooring observations
83 north of Svalbard., J. Geophys. Res. Oceans, submitted.
84
85 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
86 measurements from moorings north of Svalbard: September 2018 - November 2019,
87 Tech. Report, doi: 10.21335/NMDC-1075977612.'
88
89 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
90 creator_name = 'Ilker Fer'
91 creator_email = 'ilker.fer@uib.no'
92 creator_url = 'https://www.uib.no/gfi'
93 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
94 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
95 deployment and recovery cruises.'
96
97 date_created = '2022-02-17'
98 license = 'http://creativecommons.org/licenses/by/4.0/'
99 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
100 data from moorings north of Svalbard, September 2018 - September 2019
101 https://doi.org/10.21335/NMDC-1852831792'
102
103 Dimensions:
104 TIME = 8896
105 DEPTH = 65
106 ZP = 3
107 ZT = 13
108 ZS = 4
109 ZU = 101
110
111 Variables:
112 TIME
113 Size: 8896x1
114 Dimensions: TIME
115 Datatype: double
116 Attributes:
117 standard_name = 'time'
118 long_name = 'time of measurement'
119 units = 'days since 2018-01-01T00:00:00Z'
120 axis = 'T'
121
122 DEPTH
123 Size: 65x1
124 Dimensions: DEPTH
125 Datatype: double
126 Attributes:
127 standard_name = 'Z'
128 units = 'm'

```

```

119         long_name = 'vertical distance below the sea surface'
120         axis = 'Z'
121         positive = 'down'
122     TEMP
123         Size: 65x8896
124         Dimensions: DEPTH, TIME
125         Datatype: double
126         Attributes:
127             standard_name = 'sea_water_temperature'
128             units = 'degree_Celsius'
129             long_name = 'sea water temperature in-situ ITS-90 scale'
130     PSAL
131         Size: 65x8896
132         Dimensions: DEPTH, TIME
133         Datatype: double
134         Attributes:
135             standard_name = 'sea_water_practical_salinity'
136             units = '1'
137             long_name = 'Practical salinity on the PSS-78 scale'
138     UCUR
139         Size: 65x8896
140         Dimensions: DEPTH, TIME
141         Datatype: double
142         Attributes:
143             standard_name = 'eastward_sea_water_velocity'
144             units = 'm s-1'
145             long_name = 'absolute eastward sea water velocity'
146     VCUR
147         Size: 65x8896
148         Dimensions: DEPTH, TIME
149         Datatype: double
150         Attributes:
151             standard_name = 'northward_sea_water_velocity'
152             units = 'm s-1'
153             long_name = 'absolute northward sea water velocity'
154     zPRES_ins
155         Size: 3x8896
156         Dimensions: ZP, TIME
157         Datatype: double
158         Attributes:
159             units = 'm'
160             long_name = 'vertical distance below sea surface of pressure sensor at time-varying measurement level (not gridded)'
161     zTEMP_ins
162         Size: 13x8896
163         Dimensions: ZT, TIME
164         Datatype: double
165         Attributes:
166             units = 'm'
167             long_name = 'vertical distance below sea surface of temperature sensor at time-varying measurement level (not gridded)'
168     zPSAL_ins
169         Size: 4x8896
170         Dimensions: ZS, TIME
171         Datatype: double
172         Attributes:
173             units = 'm'
174             long_name = 'vertical distance below sea surface of conductivity sensor at time-varying measurement level (not gridded)'
175     zUCUR_ins
176         Size: 101x8896
177         Dimensions: ZU, TIME
178         Datatype: double
179         Attributes:
180             units = 'm'
181             long_name = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
182     PRES_ins
183         Size: 3x8896
184         Dimensions: ZP, TIME
185         Datatype: double
186         Attributes:
187             units = 'decibar'
188             long_name = 'sea water pressure at time-varying measurement level (not gridded), equals 0 at sea-level'
189     TEMP_ins
190         Size: 13x8896
191         Dimensions: ZT, TIME
192         Datatype: double
193         Attributes:
194             units = 'degree_Celsius'
195             long_name = 'sea water temperature at time-varying measurement level (not gridded), in-situ ITS-90 scale'
196     PSAL_ins
197         Size: 4x8896
198         Dimensions: ZS, TIME
199         Datatype: double
200         Attributes:
201             units = '1'
202             long_name = 'practical salinity at time-varying measurement level (not gridded), PSS-78 scale'
203     UCUR_ins
204         Size: 101x8896
205         Dimensions: ZU, TIME
206         Datatype: double
207         Attributes:
208             units = 'm s-1'
209             long_name = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
210     VCUR_ins
211         Size: 101x8896
212         Dimensions: ZU, TIME
213         Datatype: double
214         Attributes:
215             units = 'm s-1'
216             long_name = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
217     >>

```

```

1
2 cit =
3
4 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography data from moorings north of Svalbard,
5 September 2018 - September 2019
6 https://doi.org/10.21335/NMDC-1852831792'
7
8 Source:
9 C:\Users\ngfif\OneDrive - University of Bergen\LEGACY\Moorings_NSvalbard2018\DataSubmit_NMDC\NL_W3.nc
10
11 Format:
12 netcdf4_classic
13
14 Global Attributes:
15 title = 'Physical oceanography data from moorings north of Svalbard, September 2018 - September 2019'
16 history = 'Version 1'
17 summary = 'As a part of the Nansen Legacy Project, a set of 6 moorings distributed in 2 arrays were deployed
18 across the continental slope, north of Svalbard.
19 The observations cover a 12 to 14-month period from September 2018 to September or November 2019.
20 This data set is from the offshore mooring in the western array (W3), at 81.46 N, 18.396 E, at 1216 m
21 water depth.
22
23 All time series are averaged into a common, uniform 1-hour resolution time stamp.
24 Two sets of hourly-averaged time series of temperature, salinity and horizontal currents are provided.
25 One set is 10-m vertically gridded (interpolated) after mooring motion correction (variables UCUR, VCUR,
26 TEMP, PSAL). The second set as time series at time-variable measurement level because of mooring motion
27 (variables TEMP_ins, PRES_ins etc., with corresponding depth records zTEMP_ins, zPRES_ind and so on).
28 See the variable names for details. The dimensions follow the number of sensors on the mooring.
29 These records are used to produce the gridded set. Details on the data processing, mooring drawings and a
30 detailed list of instrumentation are provided in the attached report. A brief overview is given in the
31 comment. The Nansen Legacy was supported by the Research Council of Norway (project number 276730).'
```

comment = 'Data from pressure sensors are used to correct for the mooring motion.
Magnetic declination (13degE) is corrected for. Gappy segments with record length less than 5 days are filled with NaN in the gridded data set.
The initial accuracy of the SBE sensors are 2x10-3C for temperature, 3x10-4 S/m for conductivity, and 1 dbar for pressure. The compass direction is accurate to 2deg.
Error estimates are 1 cm/s for velocity, 0.01C for temperature and 0.01 for practical salinity.
The distribution of the instruments on this mooring is as follows.
(Parameter legend: T=TEMP; S=PSAL; V=horizontal currents; P=PRES)

Target Depth (m)	Parameter	Instrument
103, 304, 794,962	T, S, P	SBE37 6097, RBR 60645, RBR 60646, SBE37 6018
1165	T, S	SBE37 7336
610	T, P	SBE39 6145,
104, 153, 204	T	SBE56 1335, 1337, 1338
254, 406, 508	T	SBE56 1339, 1345, 1948
712,1064	T	SBE56 1951, 1953
812	P	Nortek S55, SN200062
185:12:773	V	--- upward pointing profile ---
814	P	Nortek S100, SN100758
827:8:1139	V	--- downward pointing profile ---
1196	T, P, V	AADI SG SN1902

Offset corrections applied to various sensors are described in the attached report.
Some SBE37 and RBR CTDs required corrections with the following constant salinity offsets:

SBE37 SN6018	: +0.008
SBE37 SN7336	: +0.013
RBR SN60646	: -0.026

Salinity from SG SN1902 is not used.
The SG SN1902 velocity direction was corrected by -10 after comparison with S100 SN100758. The Nortek S100 SN100758 direction measurements were adjusted to the direction of the first bin of the Nortek S55 SN20062.'

```

56 type = 'Hourly-averaged time series of temperature, salinity and horizontal velocity'
57 creation_time = '2022-02-17T20:15:33Z'
58 date_update = '2022-02-17T20:15:33Z'
59 Conventions = 'CF-1.6, ACDD-1.3'
60 data_mode = 'D'
61 platform_type = 'mooring'
62 source = 'moored instruments'
63 area = 'Arctic Ocean, North of Svalbard'
64 latitude = 81.4559
65 longitude = 18.3955
66 sea_floor_depth_below_sea_level = 1216
67 geospatial_lat_min = 81.4559
68 geospatial_lat_max = 81.4559
69 geospatial_lon_min = 18.3955
70 geospatial_lon_max = 18.3955
71 time_coverage_start = '2018-09-20T20:00:00Z'
72 time_coverage_end = '2019-09-21T12:00:00Z'
73 institution = 'University of Bergen'
74 principal_investigator = 'Fer, Ilker'
75 principal_investigator_ORCID = '0000-0002-2427-2532'
76 authors = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti'
77 contact = 'ilker.fer@uib.no'
78 project_name = 'The Nansen Legacy'
79 references = 'Koenig, Z., Kalhagen K., Kolås, E., Fer, I., Nilsen, F., and Cottier, F. (2002).
80 Atlantic Water properties, transport and variability from mooring observations
81 north of Svalbard., J. Geophys. Res. Oceans, submitted.
82
83 Koenig, Z., Kalhagen, K., and Fer, I. (2022). Ocean current, temperature and salinity
84 measurements from moorings north of Svalbard: September 2018 - November 2019,
85 Tech. Report, doi: 10.21335/NMDC-1075977612.'
86 keywords = 'Arctic Ocean, Svalbard, oceanography, currents, hydrography'
87 creator_name = 'Ilker Fer'
88 creator_email = 'ilker.fer@uib.no'
89 creator_url = 'https://www.uib.no/gfi'
90 acknowledgement = 'The Nansen Legacy project (276730) is supported by the Research Council of Norway.
91 We thank the officers, crew and scientists of the R/V Kronprins Haakon during the
92 deployment and recovery cruises.'
93 date_created = '2022-02-17'
94 license = 'http://creativecommons.org/licenses/by/4.0/'
95 citation = 'Fer, Ilker; Koenig, Zoe; Kolås, Eivind; Baumann, Till; Kalhagen, Kjersti (2022), Physical oceanography
96 data from moorings north of Svalbard, September 2018 - September 2019
97 https://doi.org/10.21335/NMDC-1852831792'
98
99 Dimensions:
100 TIME = 8777
101 DEPTH = 109
102 ZP = 6
103 ZT = 15
104 ZS = 5
105 ZU = 91
106
107 Variables:
108 TIME
109 Size: 8777x1
110 Dimensions: TIME
111 Datatype: double
112 Attributes:
113 standard_name = 'time'
114 long_name = 'time of measurement'
115 units = 'days since 2018-01-01T00:00:00Z'
116 axis = 'T'
117
118 DEPTH
119 Size: 109x1
120 Dimensions: DEPTH

```

```

118 Datatype: double
119 Attributes:
120     standard_name = 'Z'
121     units         = 'm'
122     long_name    = 'vertical distance below the sea surface'
123     axis         = 'Z'
124     positive     = 'down'
125
126 TEMP
127     Size:         109x8777
128     Dimensions:  DEPTH, TIME
129     Datatype:    double
130     Attributes:
131         standard_name = 'sea_water_temperature'
132         units         = 'degree_Celsius'
133         long_name    = 'sea water temperature in-situ ITS-90 scale'
134
135 PSAL
136     Size:         109x8777
137     Dimensions:  DEPTH, TIME
138     Datatype:    double
139     Attributes:
140         standard_name = 'sea_water_practical_salinity'
141         units         = '1'
142         long_name    = 'Practical salinity on the PSS-78 scale'
143
144 UCUR
145     Size:         109x8777
146     Dimensions:  DEPTH, TIME
147     Datatype:    double
148     Attributes:
149         standard_name = 'eastward_sea_water_velocity'
150         units         = 'm s-1'
151         long_name    = 'absolute eastward sea water velocity'
152
153 VCUR
154     Size:         109x8777
155     Dimensions:  DEPTH, TIME
156     Datatype:    double
157     Attributes:
158         standard_name = 'northward_sea_water_velocity'
159         units         = 'm s-1'
160         long_name    = 'absolute northward sea water velocity'
161
162 zPRES_ins
163     Size:         6x8777
164     Dimensions:  ZP, TIME
165     Datatype:    double
166     Attributes:
167         units         = 'm'
168         long_name    = 'vertical distance below sea surface of pressure sensor at time-varying measurement level (not gridded)'
169
170 zTEMP_ins
171     Size:         15x8777
172     Dimensions:  ZT, TIME
173     Datatype:    double
174     Attributes:
175         units         = 'm'
176         long_name    = 'vertical distance below sea surface of temperature sensor at time-varying measurement level (not gridded)'
177
178 zPSAL_ins
179     Size:         5x8777
180     Dimensions:  ZS, TIME
181     Datatype:    double
182     Attributes:
183         units         = 'm'
184         long_name    = 'vertical distance below sea surface of conductivity sensor at time-varying measurement level (not gridded)'
185
186 zUCUR_ins
187     Size:         91x8777
188     Dimensions:  ZU, TIME
189     Datatype:    double
190     Attributes:
191         units         = 'm'
192         long_name    = 'vertical distance below sea surface of horizontal velocity sensor at time-varying measurement level (not gridded)'
193
194 PRES_ins
195     Size:         6x8777
196     Dimensions:  ZP, TIME
197     Datatype:    double
198     Attributes:
199         units         = 'decibar'
200         long_name    = 'sea water pressure at time-varying measurement level (not gridded), equals 0 at sea-level'
201
202 TEMP_ins
203     Size:         15x8777
204     Dimensions:  ZT, TIME
205     Datatype:    double
206     Attributes:
207         units         = 'degree_Celsius'
208         long_name    = 'sea water temperature at time-varying measurement level (not gridded), in-situ ITS-90 scale'
209
210 PSAL_ins
211     Size:         5x8777
212     Dimensions:  ZS, TIME
213     Datatype:    double
214     Attributes:
215         units         = '1'
216         long_name    = 'practical salinity at time-varying measurement level (not gridded), PSS-78 scale'
217
218 UCUR_ins
219     Size:         91x8777
220     Dimensions:  ZU, TIME
221     Datatype:    double
222     Attributes:
223         units         = 'm s-1'
224         long_name    = 'absolute eastward sea water velocity at time-varying measurement level (not gridded)'
225
226 VCUR_ins
227     Size:         91x8777
228     Dimensions:  ZU, TIME
229     Datatype:    double
230     Attributes:
231         units         = 'm s-1'
232         long_name    = 'absolute northward sea water velocity at time-varying measurement level (not gridded)'
233
234 >>

```