CRUISE REPORT

Cruise HM 2015617
with R.V. Håkon Mosby

12 – 21 August 2015

Working Areas:
West Spitsbergen, Southern Yermak Plateau
Nordfjorden in Svalbard

Geophysical Institute, University of Bergen

Ilker Fer

1. Background

The cruise HM 2015617 onboard the Research Vessel *Håkon Mosby* is the second and last research cruise of the project ”*On Thin Ice (NICE): Role of Ocean Heat Flux in Sea Ice Melt*”. NICE is led at the Geophysical Institute, University of Bergen (PI: Ilker Fer) and is funded by the Research Council of Norway (project number 229786) for the period 01.01.2014-31.12.2017.

The overall objective of NICE is to study the role of diapycnal mixing for the heat budget of the Arctic Ocean, the role of ocean heat flux in modulating the ice thickness and area, and the associated feedbacks. In summer 2014 an array of 3 moorings were deployed near the ice edge. The primary aim of the present cruise is to recover these moorings. Additionally process studies of ocean mixing in response to wind and tide forcing are planned west and north of Spitsbergen. We have also attempted to coordinate the field work with the sampling scheme of the REOCIRC project lead by Frank Nilsen at UNIS.

This report provides an overview of the methods employed and the data collected.

2. Cruise participants

	Name	Institute[1]	Responsibility[2]
Scientists	Ilker Fer (cruise leader) Ilker.fer@uib.no	UIB	VMP & LADCP & VMADCP
	Mostafa Bakhoday Paskyabi	UIB	VMP & VMADCP
	Chuncheng Guo	UIB	CTD & LADCPs
	Eivind Kolås	UIB	CTD & LADCP
	Allison Einolf	OSU-USA	VMP
Technical personnel	Steinar Myking	UIB	Moorings and VMP winch
	Helge Bryhni	UIB	Moorings and VMP winch
	Geir Landa	HI	CTD

[1] UIB: University of Bergen; HI: Institute of Marine Research, Bergen; OSU-USA: Oregon State Univ.
[2] The instrument and acronyms are described in the report.

Captain : Tom Ole Drange **Chief Officer** : Rune Kleppe

3. Cruise Overview

A cruise narrative is given in Appendix A. The cruise track is shown in Figure 1. The cruise was conducted between 12 and 21 August 2015 (Longyearbyen / Longyearbyen). In total 60 CTD/LADCP (conductivity temperature depth / lowered acoustic Doppler current profiler) stations, and 100 microstructure casts (with data) were made using the microstructure profiler VMP2000. A complete list of CTD and VMP stations is tabulated in Appendix B. The vessel-mounted ADCP (VM-ADCP) sampled continuously throughout the cruise. Early in the cruise, 3 moorings were recovered. Shipboard instrument and mooring details are given in the following sections.

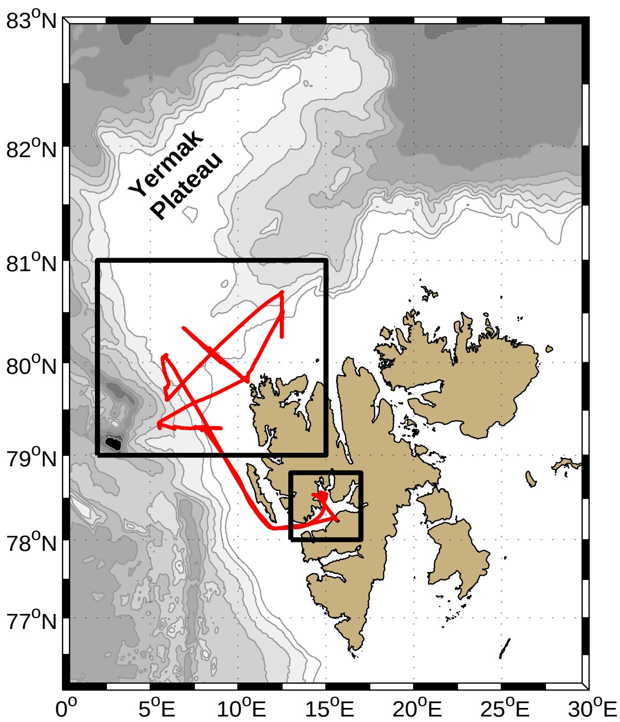


Figure 1. Cruise track of HM 2015617 and the seabed topography around the Svalbard archipelago. Isobaths are drawn at 500 m intervals. Domain of the enlarged stations maps shown in Figure 2 and Figure 3 are indicated.

The following maps show the stations together with the mooring locations. Figure 2 shows the sampling in the region north of Svalbard. In total, 3 Sections are taken. In Section A, both CTD/LADCP and VMP are deployed at each station. Section A ends with a 12-h repeat station, R1 (VMP only). Section B (CTD/LADCP only) is then taken followed by two 12-h repeat stations, R2 and R3. The aim of the repeat stations, in general, is to resolve the semidiurnal variability, obtain unbiased average profiles and to infer semidiurnal/near-inertial baroclinic energy fluxes. Subsequently, Section C is taken, starting from the offshore end; both the CTD/LADCP and the VMP are used. The section is concluded with the 12-h repeat station R4. Note that all repeat stations are VMP only, and we rely on the VM-ADCP for current measurements at the repeat stations. Finally, in Nordfjorden (Figure 3Figure 3), we occupy 6 stations (N0 to N5), where both CTD/LADCP and VMP are deployed. N0 is occupied only once. N1 to N3 are rotated continuously giving 4 occupations at each, spread in a 12 hour period. The sampling is completed by taking stations N4 and N5 close to the glacier front. The glacier station (N4) was closest to Sveabreen, approximately 500 m from the glacier front. Wahlenbergbreen is just south of Sveabreen with a point called Muslingodden separating these glacier fronts. Station N5, farther away from the front, is along the thalweg at approximately 86 m depth. A CTD/LADCP is taken at N4 and N5 before yo-yo repeat profiles using the VMP (5 profiles at N4 and 2 profiles at N5).

Time series of the meteorological conditions and depth from the ship's echo sounder are shown in Figure 4 together with the time of occupation of sections and repeat stations.

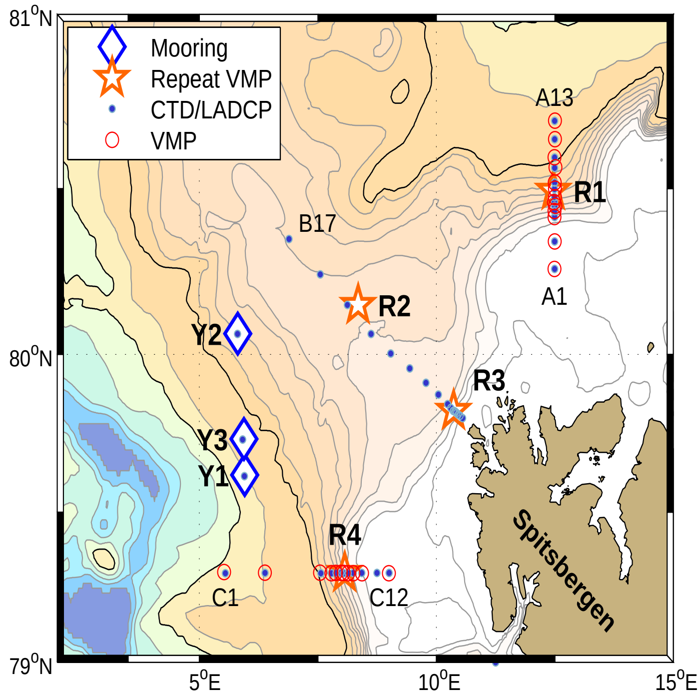


Figure 2. Station map, HM 2015617. (Nordfjord stations are shown separately in Figure 3). CTD/LADCP stations and VMP casts are shown with markers as indicated in the legend. During the repeat stations R1 to R4, only VMP is deployed. Moorings are labelled Y1 to Y3. Sections A, B and C are indicated by their edge stations with corresponding numbers. The southern part of Yermak Plateau is behind the legend. Isobaths are at 100-m interval to 1000 m and 500-m interval thereafter (1000 and 2000 m in black).

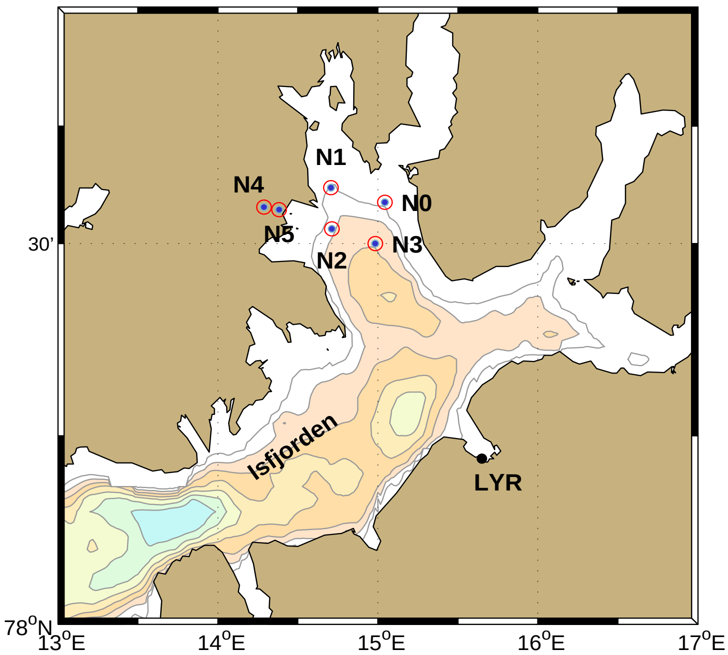


Figure 3. Station map, HM 2015617: Nordfjord stations N0 to N5. N0 is occupied only once, where N1 to N3 are occupied 4 times through approximately 12 hours. N4 and N5 are close to a glacier front. At each station CTD/LADCP and VMP are deployed. Isobaths are drawn at 50 m intervals. LYR is Longyearbyen.

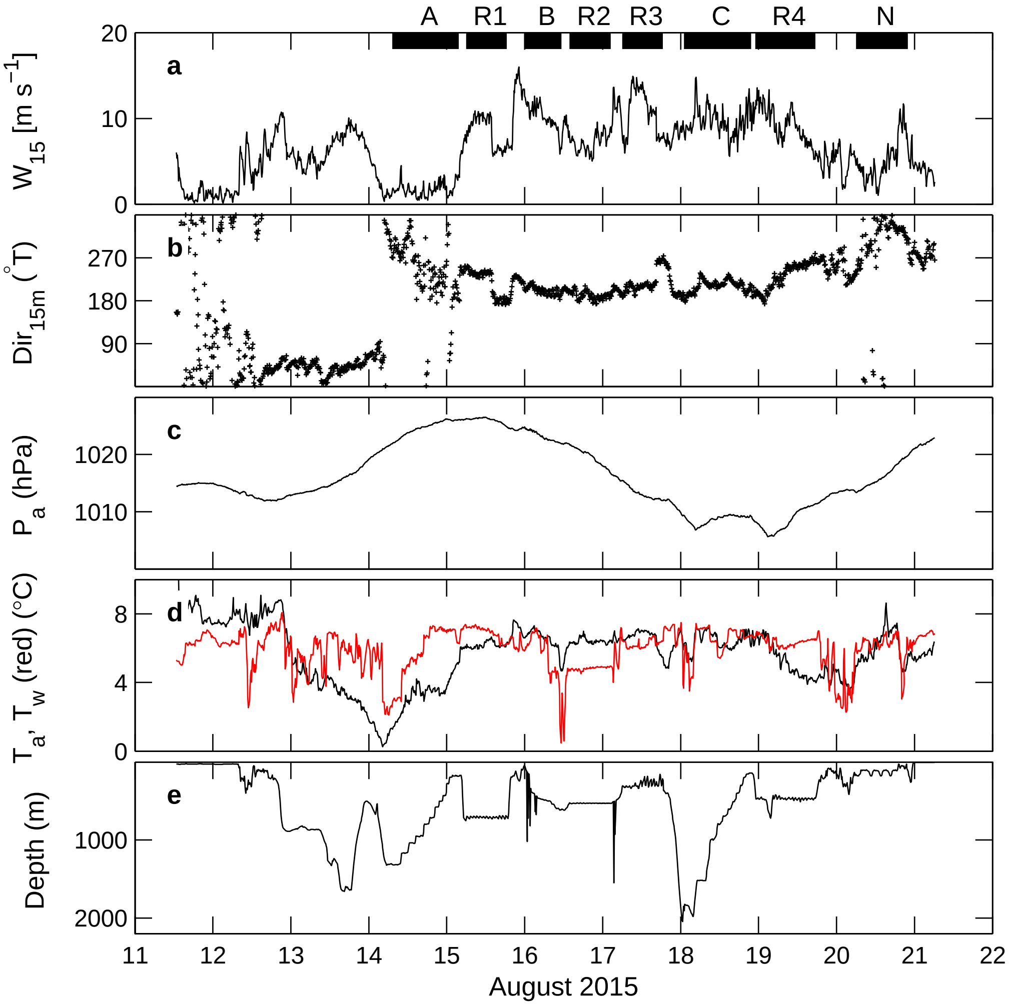


Figure 4. 10-minute averaged data from the ship's log: a) wind speed, b) direction, and c) atmospheric pressure measured at 15-m height, e) near-surface water (red) and 15-m height air temperature, depth from the ship's echo sounder. Duration of sections A-C, repeat stations R1-R4, and the Nordfjord stations are indicated at the top.

4. Mooring recovery

3 bottom anchored moorings were deployed during a cruise on board KV Svalbard in September 2014, near the ice edge north of Svalbard. The positions are detailed in Table 1 and shown in Figure 2. The details of the instrumentation are given in mooring diagrams in Appendix 3. All three moorings were successfully retrieved during the present cruise, on 13 August 2015.

Table 1. Mooring deployment and recovery details.

Mooring	Lon (E)	Lat (N)	Echo Depth (m)	Deployed (UTC)	Retrieved (UTC) (release time)
Y1	5E 57.541	79 N 37.209	1535	10.09.2014 18:55	13.08.2015 17:00
Y2	5E 48.733	80N 03.876	850	10.09.2014 09:05	13.08.2015 08:00
Y3	5E 56.333	79N 44.093	1209	11.09.2014 10:47	13.08.2015 13:00

5. Hydrography

The hydrographic work was carried out using a CTD-water sampling package from SeaBird Inc., acquiring data during both down and upcast. The package consisted of a SBE 911plus CTD with sensors listed below. The Benthos altimeter (200 kHz) allowed profiling close to the bottom. The CTD was equipped with a 24 position SBE 32 Caroussel, fitted with a single 10 litre sampling bottle. The CTD rosette, together with the acoustic Doppler current profilers (Section 6), is shown in Figure 5. At selected stations, water samples for salinity calibration were collected at the deepest sampling level. In total 61 CTD-stations were taken, recorded in files sta0458to sta0518. Their locations are listed in Appendix B. Station positions are shown in Figure 2.

SBEDataProcessing-Win32, standard Seabird Electronics software for Windows, is used for post-processing of the CTD data. Only data from downcasts are used to avoid turbulence caused by rosette package on the upcast. Raw data (pressure, temperature and conductivity from dual sensors) are converted to physical units using calibration files modified for air pressure and conductivity slope factor (DATCNV). Outliers, differing more than 2 and 20 standard deviations for the first and second pass, respectively, from the mean of 100 scan windows are flagged and excluded from analysis (WILDEDIT). WILDEDIT flags only the bad data point of each parameter, and does not flag the entire scan. The thermal mass effects in the conductivity cell are corrected for (CELLTM, with parameters alpha = 0.03 and 1/beta = 7.0). Pressure is low-pass filtered with a time constant of 0.15 s. Both conductivity signals were low-pass filtered with a time constant of 0.03 s. Auxiliary sensors (oxygen, flC, Trans) were not filtered. Scans when the CTD package moved less than the set minimum fall rate of 0.25 m s^{-1} are flagged to remove pressure reversals due to ship heave (LOOPEDIT). Data are then averaged (BINAVG) into 1-dbar vertical bins and 1-s temporal bins (the latter is for the LADCP data processing). The 1-s processing is done for the entire profile (both down and upcasts). In the final (converted and bin-averaged) data files, temperature is saved using the ITS-068 scale, and salinity on the practical salinity scale (PSS-78). Pressure, temperature, and salinity data are accurate to ±0.5 dbar, $\pm 2\times10^{-3}$ °C, and $\pm 3\times10^{-3}$, respectively. Further conversions were made to ITS-90 scale, and Conservative Temperature and absolute Salinity, using the Gibbs Seawater Library Matlab package.

A total of 20 salinity bottle samples are analyzed at IMR with a Guildline Portasal 8410 salinometer. 1 reading appears erroneous and is excluded from the analysis. Using the 19 salinity calibration samples, and excluding one outlier, a slope correction of 1.00001 on the conductivity was inferred. However, the effect on the salinity result is not better than the measurement accuracy. After applying conductivity slope correction to the 19 samples, the RMS difference between bottle and CTD salinity before correction is 0.00177, and improves slightly to 0.00174. In conclusion, the salinity measurements are deemed accurate and no further correction is applied.

Table 2. Sensor details installed on the CTD rosette.

Sensor	SN	Calibration/Service date
Temperature	5127	29-Oct-14
Conductivity	3771	17-Oct-14
Pressure	0365	070406
Temperature, 2	2491	29-Oct-14
Conductivity, 2	3848	17-Oct-14
Altimeter, Benthos	1186	Aug 2015
Oxygen, SBE 43	0365	13-Mar-14
Fluorometer, Chelsea Aqua 3	11-8393-001	17-11-2011
Transmissometer, Chelsea/Seatech/Wetlab CStar	CST-996DR	21-sept-2006
PAR/Irradiance, Biospherical/Licor	70140	27-aug-2007
RDI WH300 L-ADCP ,downlooker	10012	
RDI WH300 L-ADCP ,uplooker	10151	

Figure 5. The CTD rosette together with the CTD sensors, one 10-liter Niskin bottle, a down and uplooker ADCP, and a benthos altimeter installed. The transducers of both ADCPs and the altimeter have a non-obstructed path. The position of the lead weights and the ADCPs are adjusted to have a negligible tilt of the entire system.

6. Current Profiling

6.1. Lowered-ADCP (LADCP)

Two LADCP-profilers (RD Instruments) were mounted on the CTD rosette in order to obtain current profiles (Figure 5). The ADCPs are 6000 m-rated 300 kHz Sentinel Workhorses with internal batteries. Each ADCP has the L-ADCP option installed and has the firmware v16.3. The ADCPs were configured to sample in master/slave mode to ensure synchronization. The master ADCP pointed downward (SN 10012) and the slave ADCP pointed upward (SN 10151). Communication with the instruments, start & stop of data acquisition and data download were done using BBTalk software. PC time (UTC) was transferred to each instrument before each cast. The vertical bin size (and pulse length) was set to 8 m for each ADCP. Single ping data were recorded in narrow bandwidth (to increase range), in beam coordinates, with blank distance set to zero. The data from the first bin are discarded during post processing. In order to mitigate a possible influence of previous pinging, especially close to steep slopes, staggered pinging with alternating sampling intervals of 0.8 s and 1.2 s were used. The altimeter worked reliably and no sign of degradation of LADCP data quality was observed. The command files for the master and slave LADCPs are given in Appendix D.

The LADCP data are processed using the LDEO software version IX.8. For each master/slave profile data, synchronized time series of CTD and navigation is used. For the purpose, NMEA GPS stream is added to each scan of the ship CTD and the data files are processed as 1-s bin averages, similar to the ADCP ping rate. LADCP-relevant processing of the CTD data included the following steps in the SBE-Data Processing software: DatCnv, WildEdit, CellTm, Filter, Binavg (1 s) and Derive.

At the time of writing (on board), the VM-ADCP is not yet processed; hence the data set from the VM-ADCP is not used for additional constraint on the inversion of the LADCP data. The data will be re-processed as soon as VM-ADCP data set is ready.

6.2. Vessel-mounted ADCP (VMADCP)

The Vessel Mounted Acoustic Doppler Velocity Profiler (VMADCP) is a 75 kHz RDI ADCP on board the RV *Håkon Mosby*, and continuously collected velocity profiles below the ship. Deployment file 2015617_BB_BT_on_1000m_8m_bins.txt is used throughout. Because most of the stations are shallower than 1000 m, we used a single deployment with bottom track on, and in broadband mode (with higher accuracy, compromising on a larger range). Blank distance is 8 m, bin size is 8 m and te number of bins is 100. Half second between bottom and water pings. Selected duration of averaging for STA and LTA files are 60 s and 300 s, respectively.

Note: To get the PRDID string sent to VmDas and written to a file, make sure the COM port is set properly: in Options -> edit data options -> communications, click on NMEA2 input, enable serial, choose COM3, baud rate 9600, no parity, 8 data bits, 1 stop bit. This will give a N2R file consisting of PADCP and PRDID strings.

During sampling, VmDAS crashed several times (unknown reason). Data acquisition is simply restarted with unit increment on file number. The VMADCP data will be post processed (not reported here) using the CODAS software maintained at University of Hawaii.

7. Microstructure Profiling

Ocean microstructure measurements were made using the vertical microstructure profiler (VMP2000, VMP hereafter) manufactured by Rockland Scientific International (http://www.rocklandscientific.com). VMP is a loosely tethered microstructure profiler for the measurement of dissipation-scale turbulence to depths down to 2000 m. During the cruise VMP SN009 was deployed. It is equipped with high-accuracy conductivity temperature depth (CTD) sensors (P Keller, T, SBE-3F, C, SBE-4C with pump SBE-5T), microstructure velocity probes (shear probes), one high-resolution temperature sensor (FP07-38-1 thermistor), one high-resolution micro-conductivity sensor (SBE7-38-1 micro-C), and three accelerometers. VMP samples signal-plus-signal-derivative on thermistor, micro-conductivity and pressure transducer, and derivative for shear signals, which is crucial for turbulence measurements, especially for the temperature microstructure. Data are transmitted in real time to a ship-board data acquisition system. VMP has an overall length of 2 m with 40/3.5 kg weight in air/water and with a nominal fall rate of 0.6 m/s.

Deployments were made using a Sytech Research Ltd. CMK-2 Hydraulic winch with Linepuller (an active line payout system that makes it possible to perform rapid repeated profiles) and 2500 m deployment cable. With proper adapters, we used the ship's hydraulics for the VMP winch, bypassing the hydraulic/electric motor. The pressure on the ship's hydraulics is adjustable, and we obtained ca. 50 bar, slightly above the recommended working pressure for the winch. During recovery, however, pressure was 80-100 bar; this did not lead to any problems. The winch and line puller system was designed to feed cable over the side of the ship, allowing the profiler to free-fall through the water column.

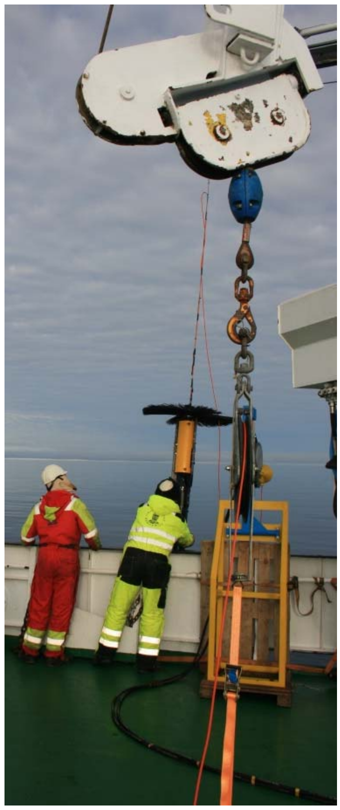


Figure 6. The set-up, on deck, of the VMP microstructure profiling system. The hydraulic winch (above); the cable is fed through a block supported by the crane in the middle. The block is fastened by straps to the deck to avoid swings due to wind and ship's roll. The tether then is fed into the line-puller (right) fastened to the ships' railing. In addition to the winch operator, a second person observes the cable in water during the deployment, and assists with deployment and recovery.

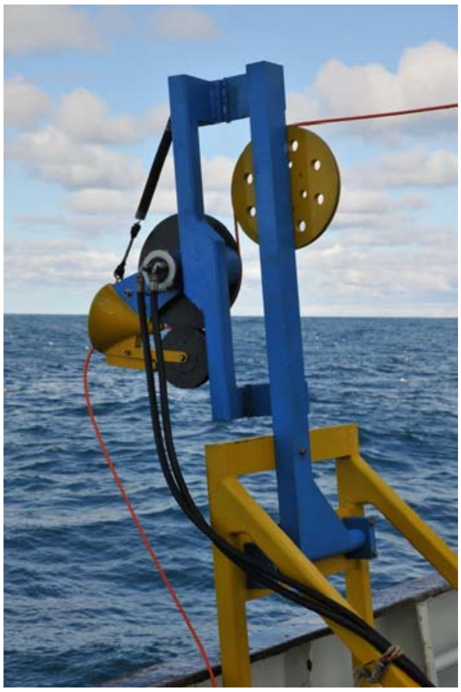


Figure 7. (Left) The VMP profiler during deployment. The brushes provide the drag for the profiler. Drag, together with the buoyancy elements (yellow) set the nominal sink velocity of the profiler. Note the recovery line attached to the cable which allows recovery by a crane without damaging the cable. (Right) The hydraulic line-puller.

Sampling was made from the starboard side, while drifting. We placed a block between the winch and the linepuller. The block is suspended from the main crane. The block is slightly (10-30 cm) above the linepuller level, ensuring that the cable does not jump off the linepuller. The block is strapped to the deck. Additionally the block is tied (by rope) to the winch, to avoid excessive wagging. The setup worked very well.

The VMP is deployed and recovered using the secondary (smaller) crane, behind the main crane (holding the block). Rope is attached to the upper end of the VMP and strapped (using cable ties and tape) approx. 2 m along the bottom part of the VMP cable. The rope ends with an eye, which is used to lift the VMP. The instrument is guided directly to its stand, secured close to the railing. The operation worked well.

The summary of the sensors used:

casts	Sh1	Sh2	mT1	mT2	mC1
0-1	M462	M546	T1018	T1019	C148
3-26	M951	M1293	T1018	T1019	C148
27-105	M462	M546	T1018	T1019	C148

The dissipation rate of TKE was calculated using the isotropic relation $\varepsilon = 7.5\nu \left\langle u_z'^2 \right\rangle$, where ν is the viscosity of seawater. Small scale shear variance $\left\langle u_z'^2 \right\rangle$ was obtained by iteratively integrating the low wavenumber portion of the shear spectrum of half-overlapping 1-second segments. Unresolved shear variance in the noise-affected high wavenumber portions was corrected using the empirical theoretical shape (Oakey 1982). The profiles of ε were produced as 1-m vertical averages to a noise level of 10^{-10} W kg^{-1}. The processed data is screened onboard, profile by profile, for eventual manual flagging of bad data from any sensor. Particularly the SBE-C sensor needed manual flagging.

8. Sampling Summary

In the following the station details are given together with corresponding contour plots from the CTD, LADCP and the VMP.

8.1. Section A.

CTD/LADCP followed by a VMP cast. Before each deployment (CTD and VMP), the ship is repositioned. The station ended approx. 15.08.2015 03:40 UTC.

Edge Stations	Start (UTC)	CTD/LADCP	VMP	VMADCP
A13	14.08 07:17	Sta 461	Cast 001	001
A1	15.08 03:11	Sta 473	Cast 015	001

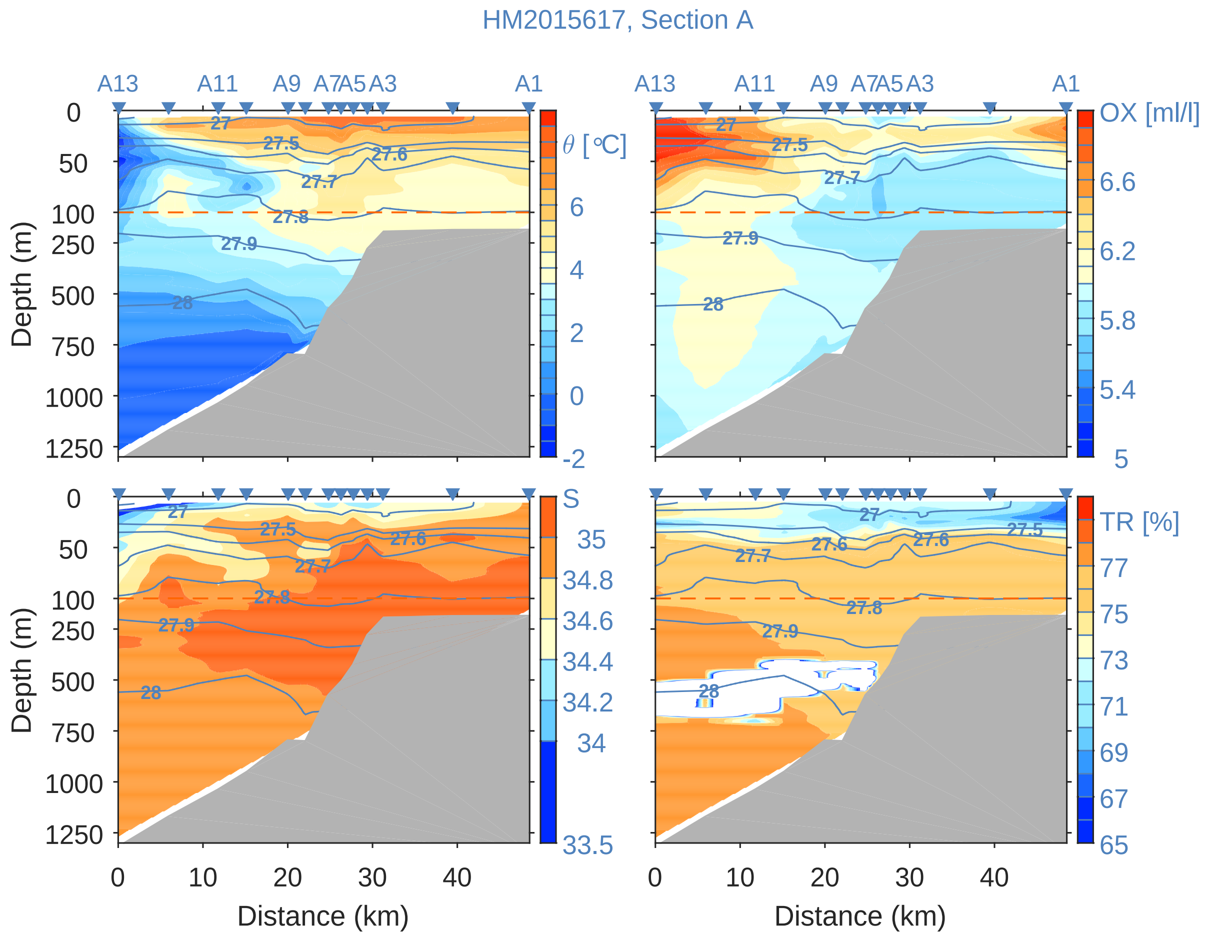


Figure 8. Contours of potential temperature (θ), salinity (S), dissolved oxygen (OX) and transmissivity (TR) for Section A. Isolines of potential density anomaly (σ_θ) are also shown (black) on each panel. Note the change in scale in the vertical axis. A band of very low and noisy (varying between 0 to 80%, but mainly < 65%) transmissivity appears in white.

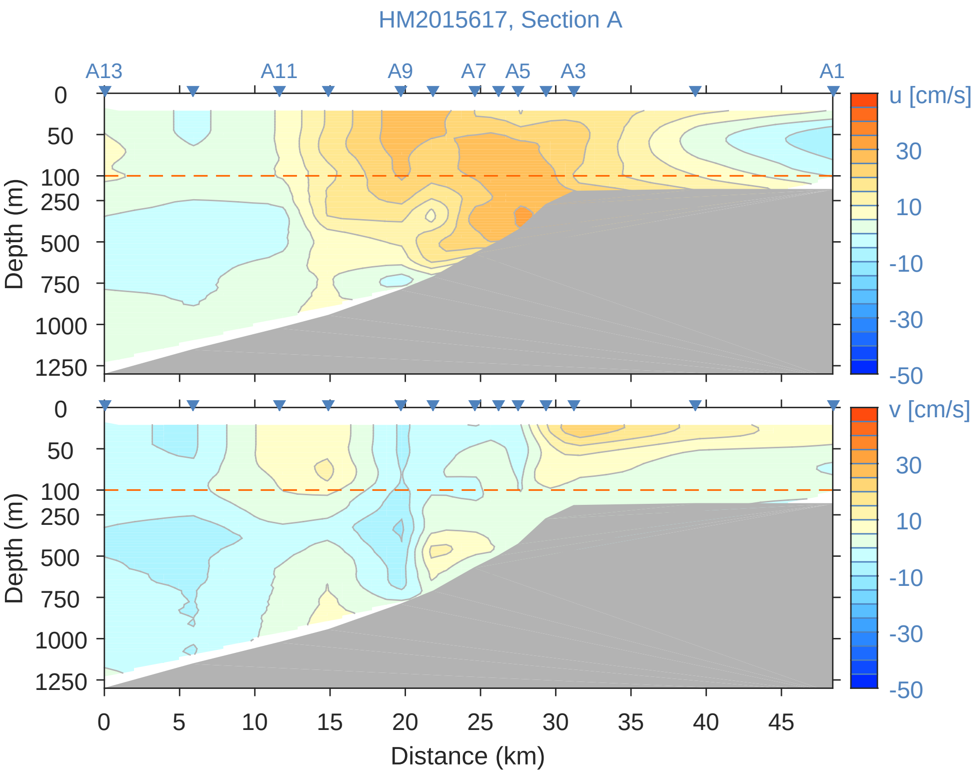


Figure 9. Contours of the east (u) and north (v) component of the velocity measured by the LADCP at Section A. Note the change in scale in the vertical axis.

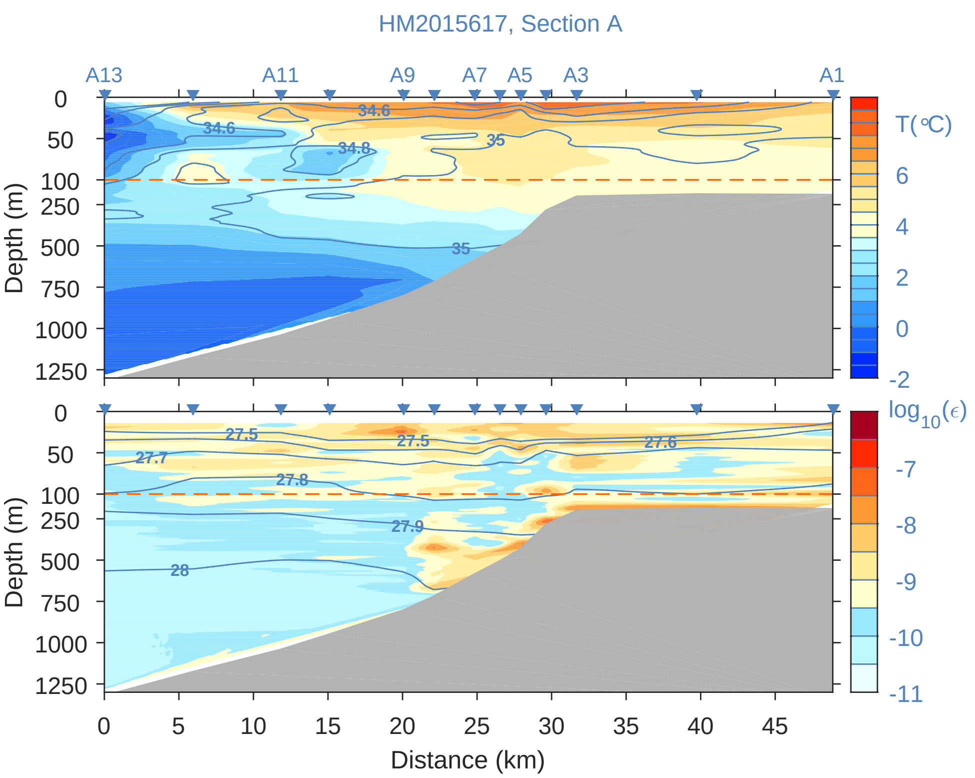


Figure 10. Section A sampled by the VMP. Upper panel shows the temperature and salinity measured by the VMP's pumped SBE CT sensors. Lower panel shows the dissipation rate averaged over the two shear probes. Black contours are the isopycnals. Note the change in scale in the vertical axis.

8.2. Repeat Station R1

A 12-hour repeat station, R1 is occupied near A8. Only VMP is deployed. The water depth is approximately 690 m. A downcast takes approximately 20 min. Ship is re-positioned before each profile.

Start (UTC)	CTD/LADCP	VMP	VMADCP
15.08 06:10	-	Cast 016	002
15.08 18:17	-	Cast 028	005

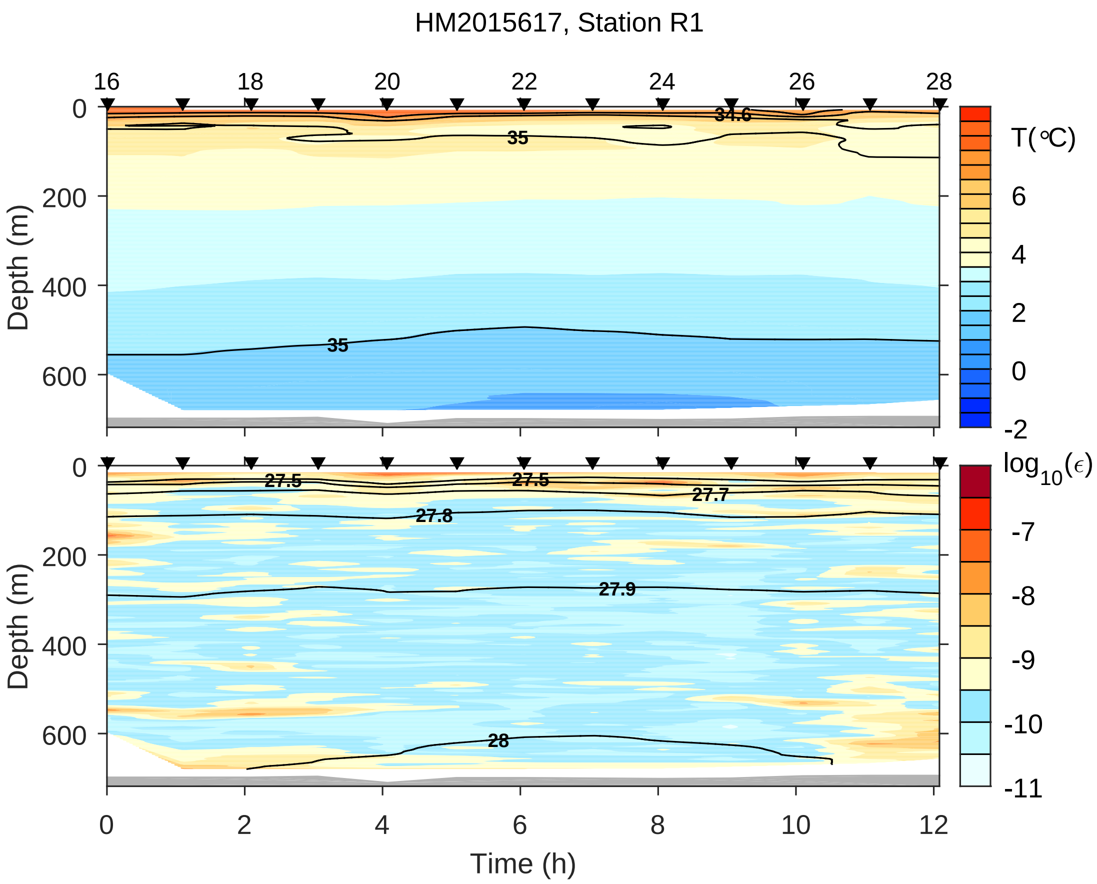


Figure 11. VMP measurements at Station R1. Parameters are as in Figure 10.

8.3. Section B

CTD/LADCP only. This section is identical to the Yermak Section of the REOCIRC project (PI, Frank Nilsen). The section is started from the southern side, on 16 August, at approximately 00:00 UTC.

Edge Stations	Start (UTC)	CTD/LADCP	VMP	VMADCP
B1	15.08 23:59	Sta 474	-	005
B17	16.08 13:12	Sta 490	-	006

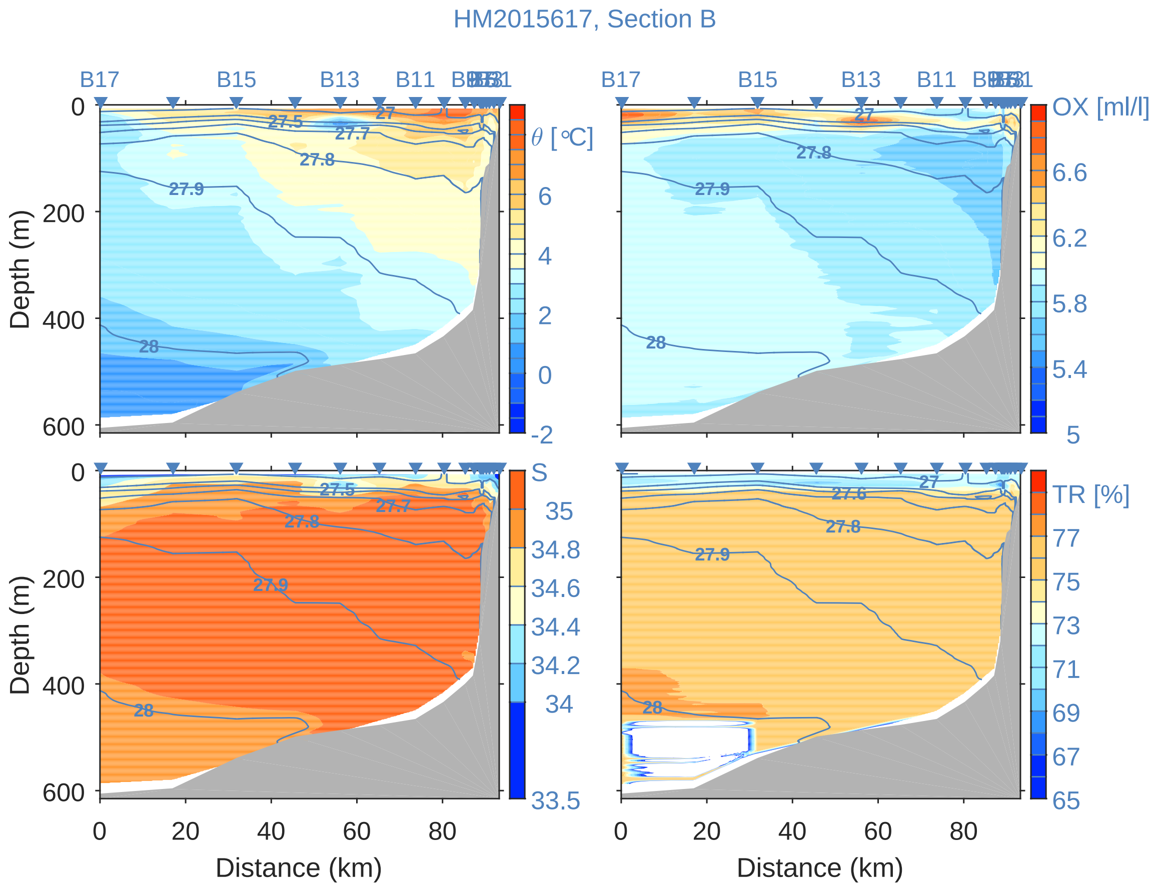


Figure 12. CTD measurements at Section B. Parameters are as in Figure 8.

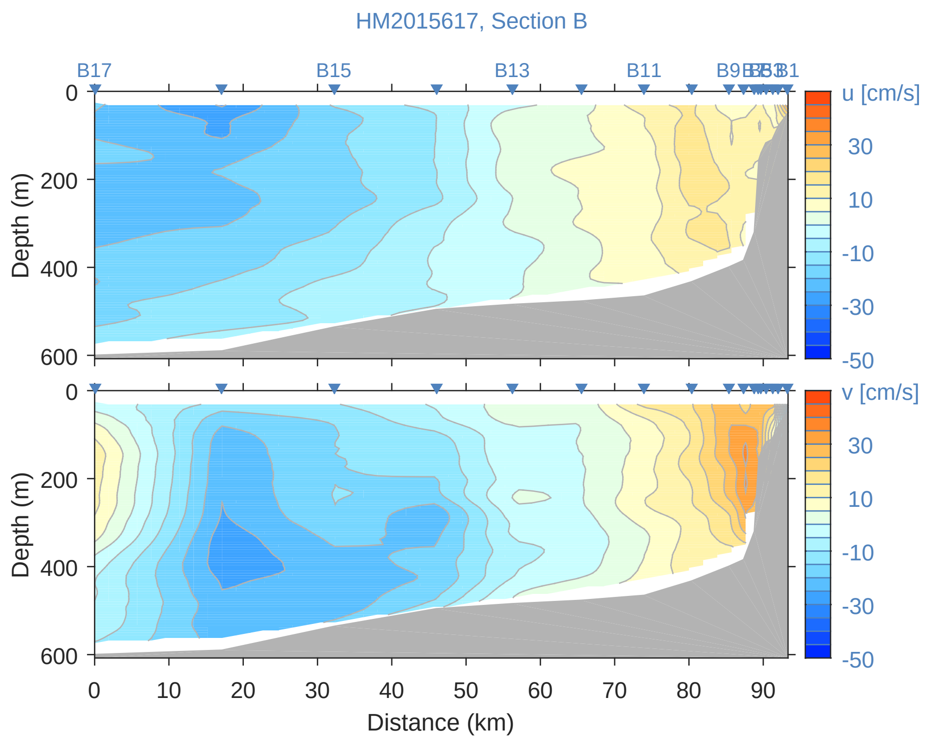


Figure 13. LADCP measurements at Section B. Parameters as in Figure 9.

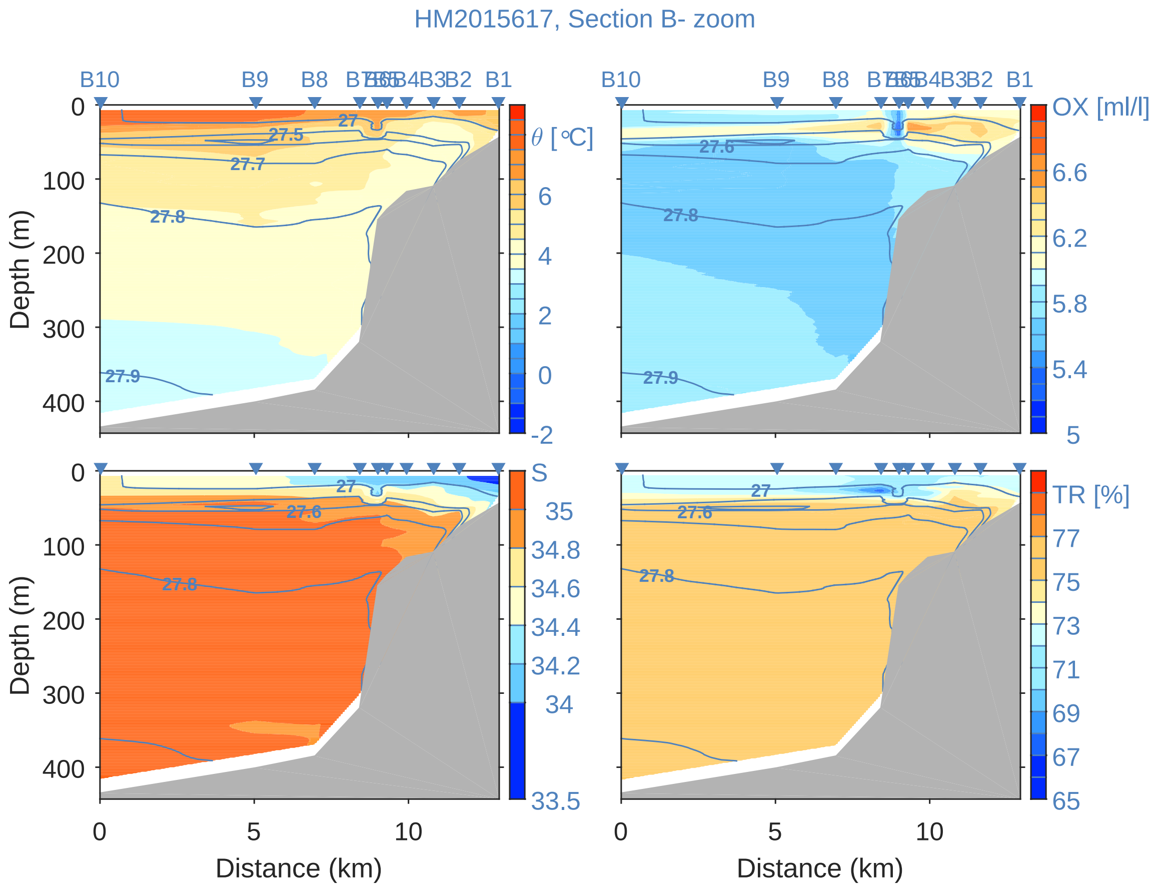


Figure 14. As in Figure 12, but zoom in to the slope stations.

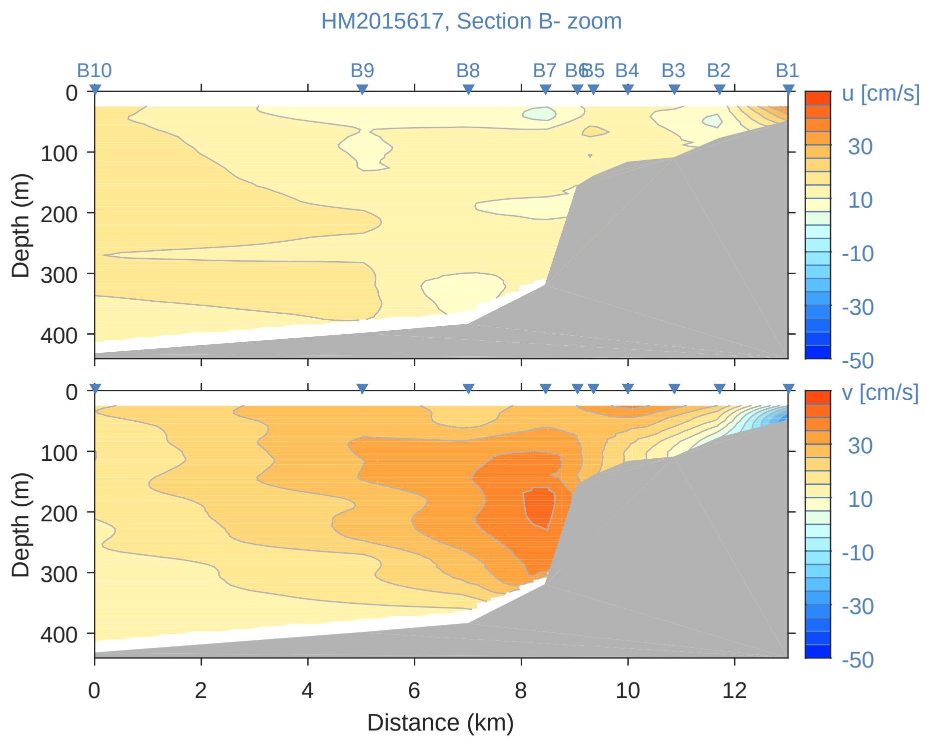


Figure 15. As in Figure 13, but zoom in to the slope stations.

Repeat Station R2. A 12-hour repeat station, R2 is occupied near B14. Only VMP is deployed. The water depth is approximately 525 m. Profiling interval is approximately 1 hour. Ship is re-positioned before each profile.

Start (UTC)	CTD/LADCP	VMP	VMADCP
16.08 13:53	-	Cast 029	006
17.08 02:15	-	Cast 041	006

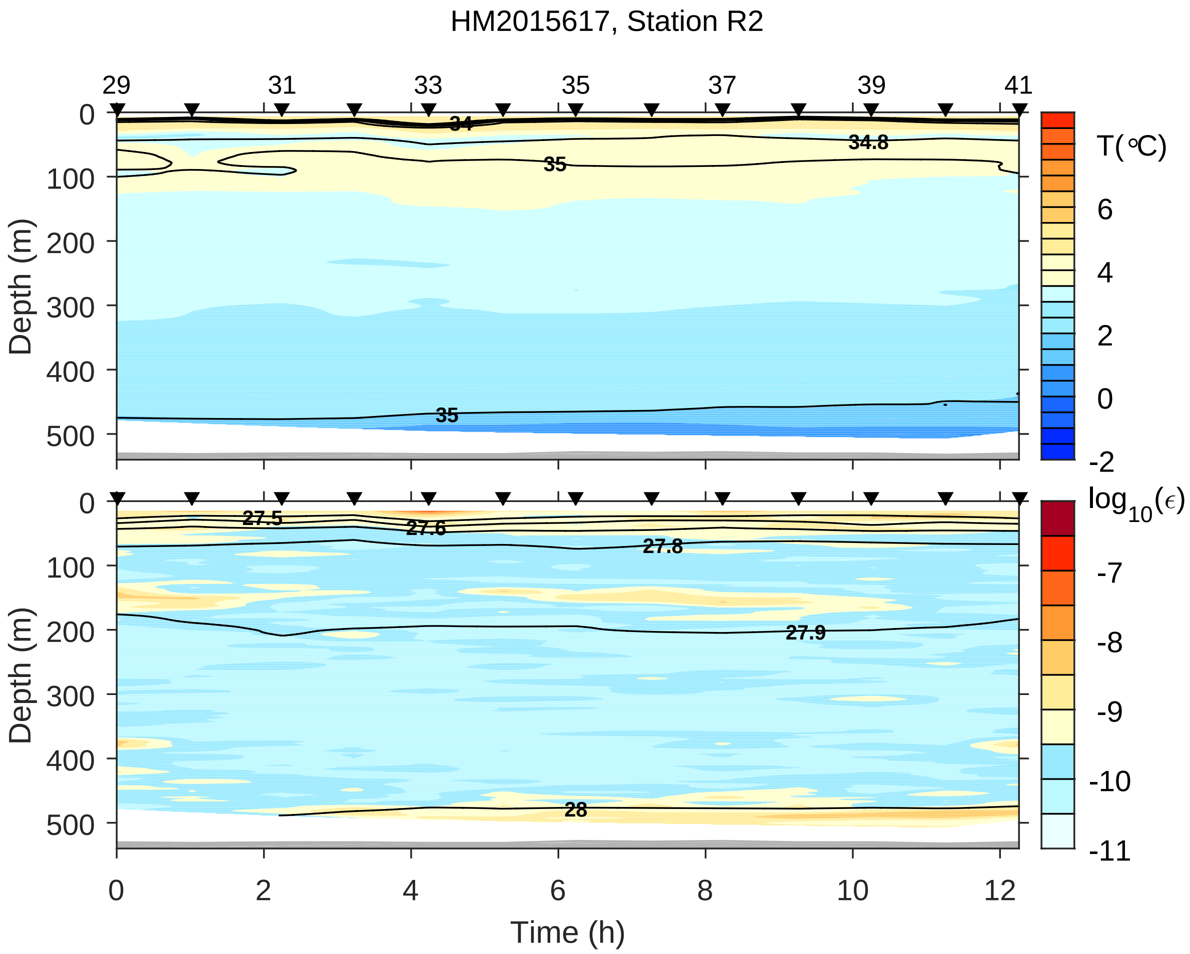


Figure 16. VMP measurements at Station R2. Parameters are as in Figure 10.

Repeat Station R3. The 12-hour repeat station R3 is occupied near B7. Only VMP is deployed, at hourly intervals. The water depth is approximately 305 m. Ship is re-positioned before each profile. We took one CTD station during R3: sta491.

Start (UTC)	CTD/LADCP	VMP	VMADCP
17.08 06:15	-	Cast 042	007
17.08 18:12	-	Cast 054	007

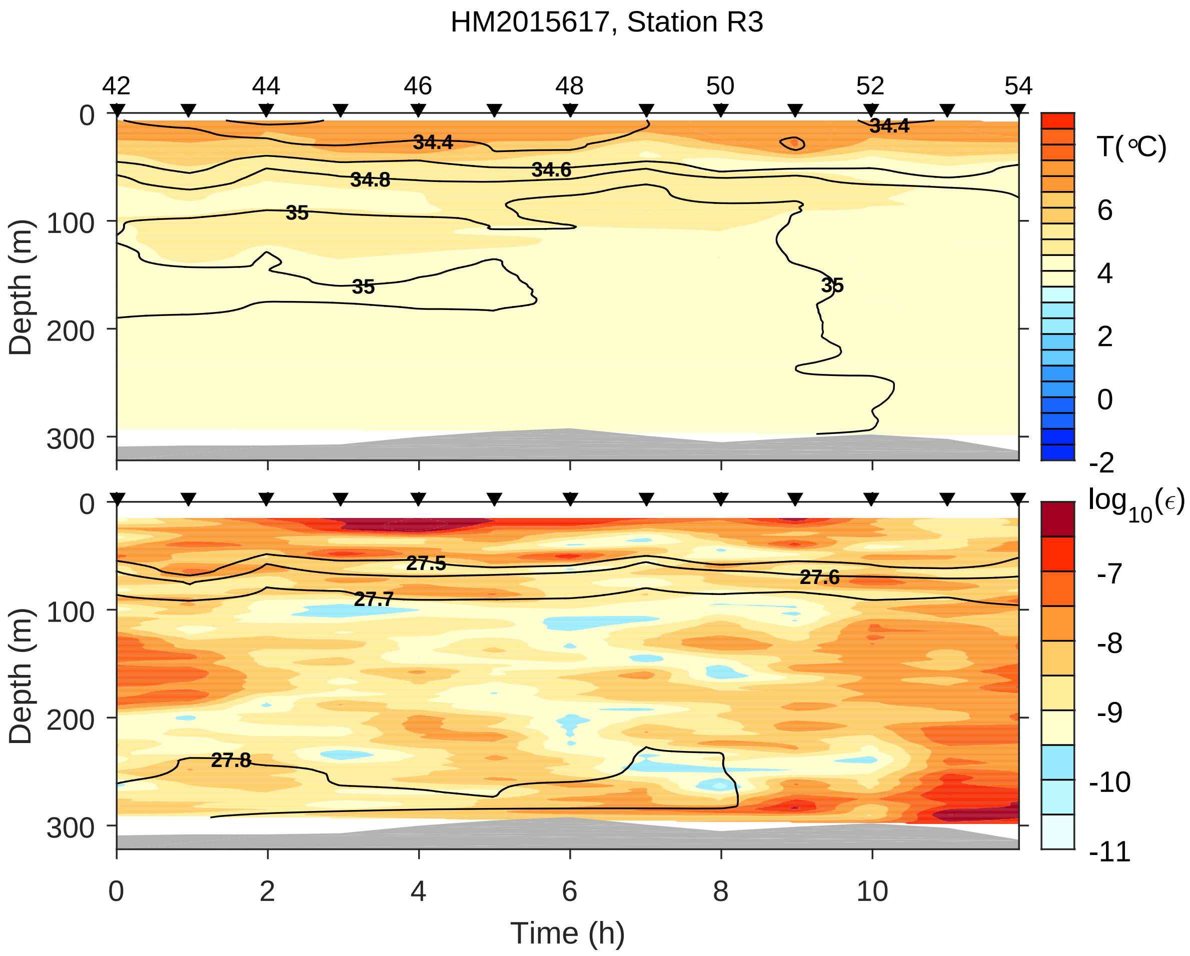


Figure 17. VMP measurements at Station R3. Parameters are as in Figure 10.

8.4. Section C

CTD/LADCP / VMP profiles. After CTD, the ship is repositioned and a VMP cast is made.

Edge Stations	Start (UTC)	CTD/LADCP	VMP	VMADCP
C1	18.08 01:09	Sta 492	Cast 055	007
C12	18.08 21:36	Sta 503	Cast 068	007

In VMP Section C (Figure 21), note that there is no data at C11. SBE-C occasionally returned bad data (due to pump failure) and some contours are thus an effect of linear interpolation. Also the gridded/interpolated portion in the bottom triangle between C3 and C2 must be interpreted with caution. Apparently unstable portions are also not natural (artefact of tentative processing).

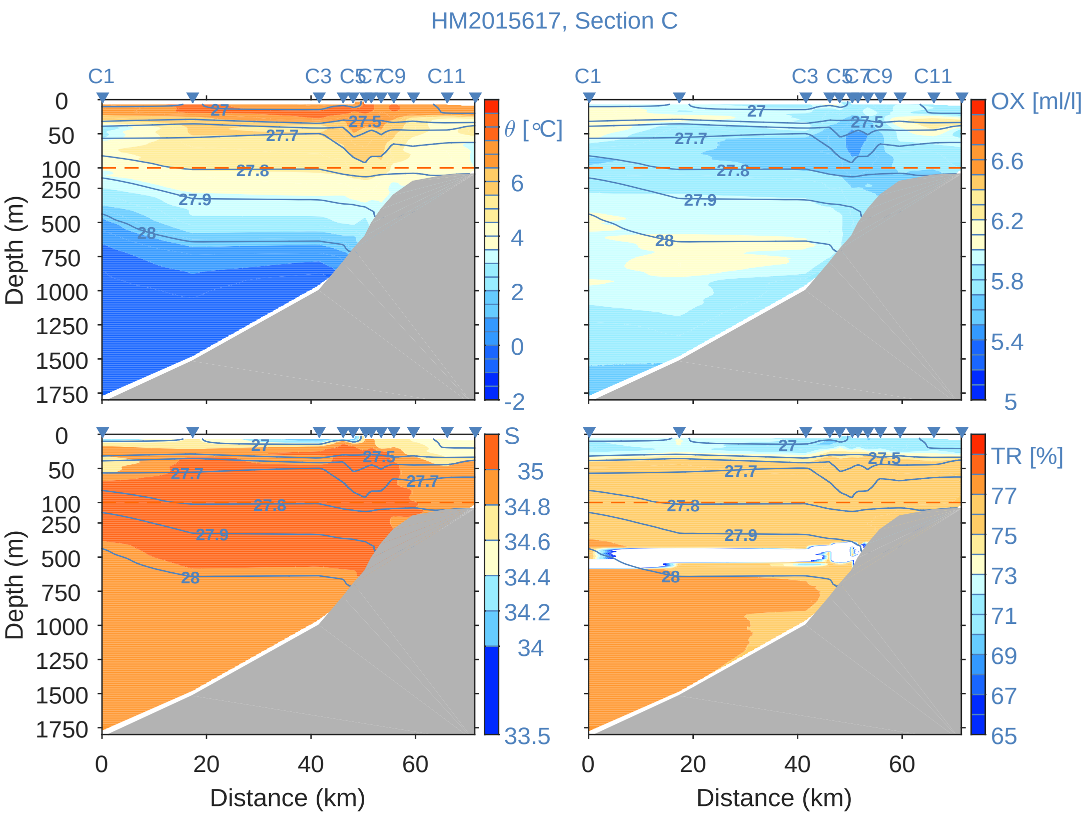


Figure 18. CTD measurements at Section C. Parameters are as in Figure 8.

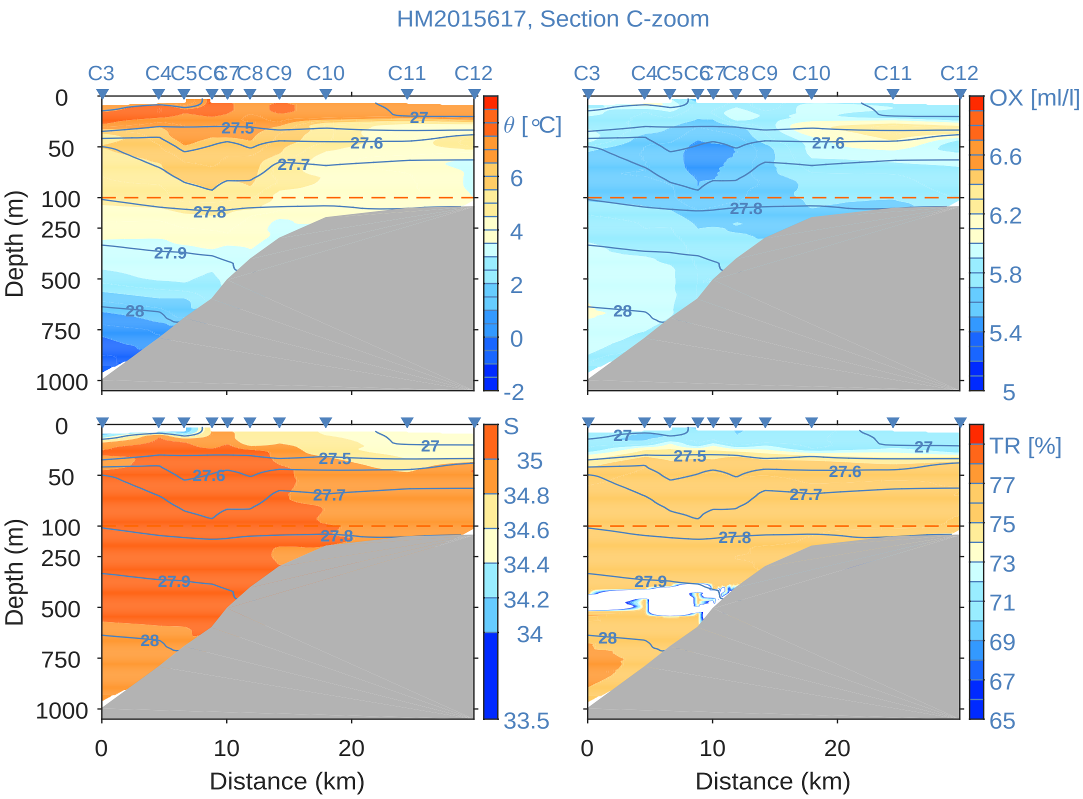


Figure 19. As in Figure 18, but zoom in to the slope stations.

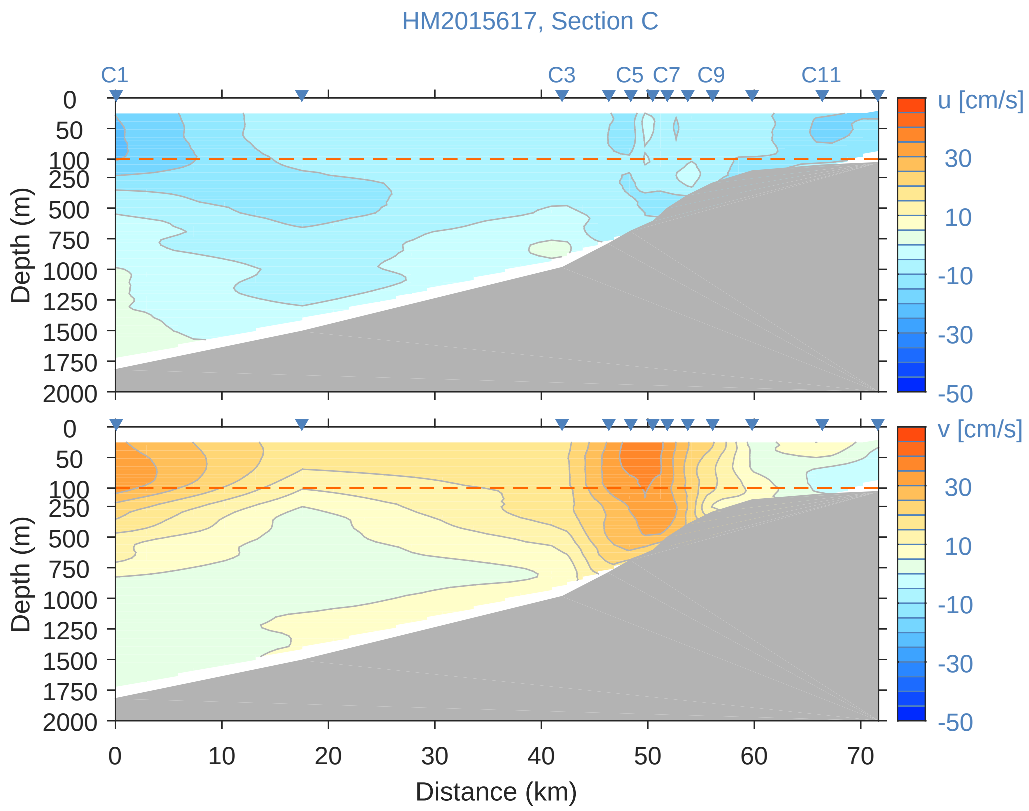


Figure 20. LADCP measurements at Section C. Parameters as in Figure 9.

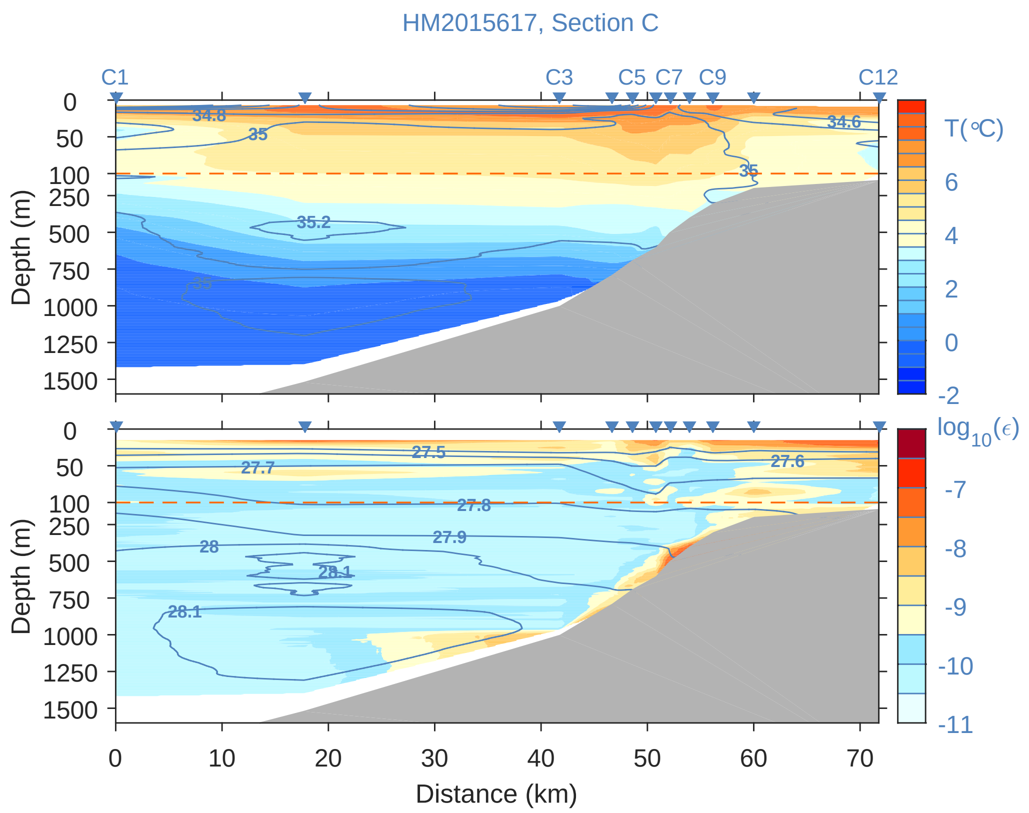


Figure 21. VMP measurements at Section C. Parameters are as in Figure 10.

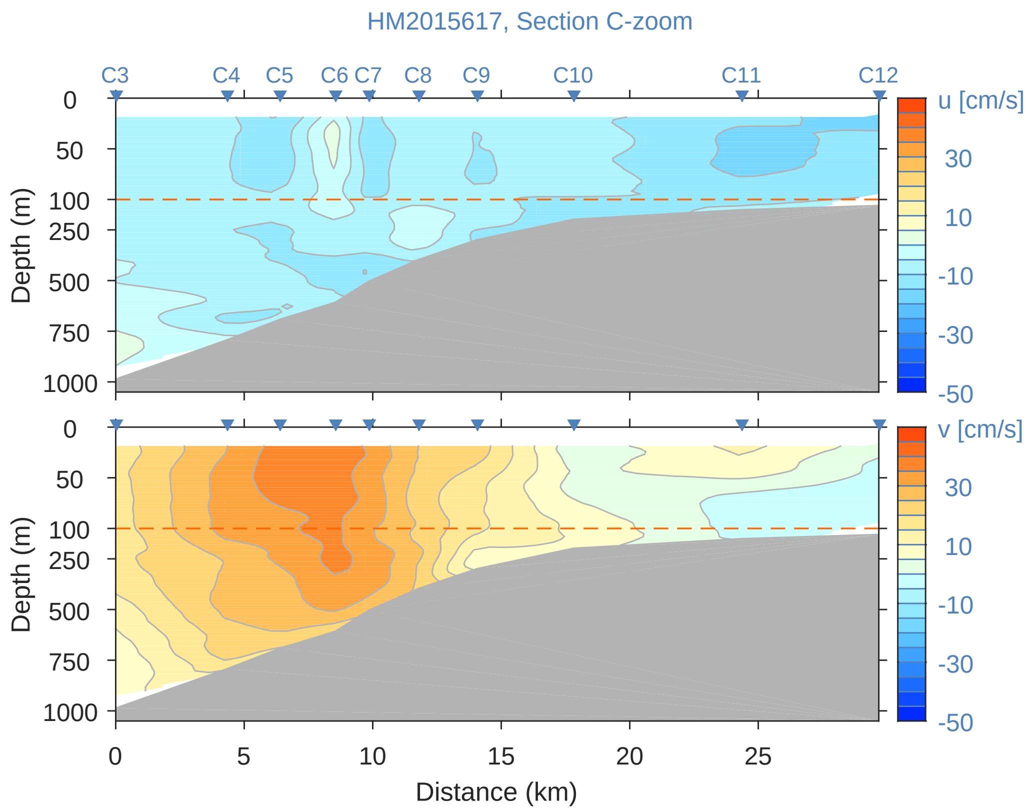


Figure 22. As in Figure 20, but zoom in to the slope stations.

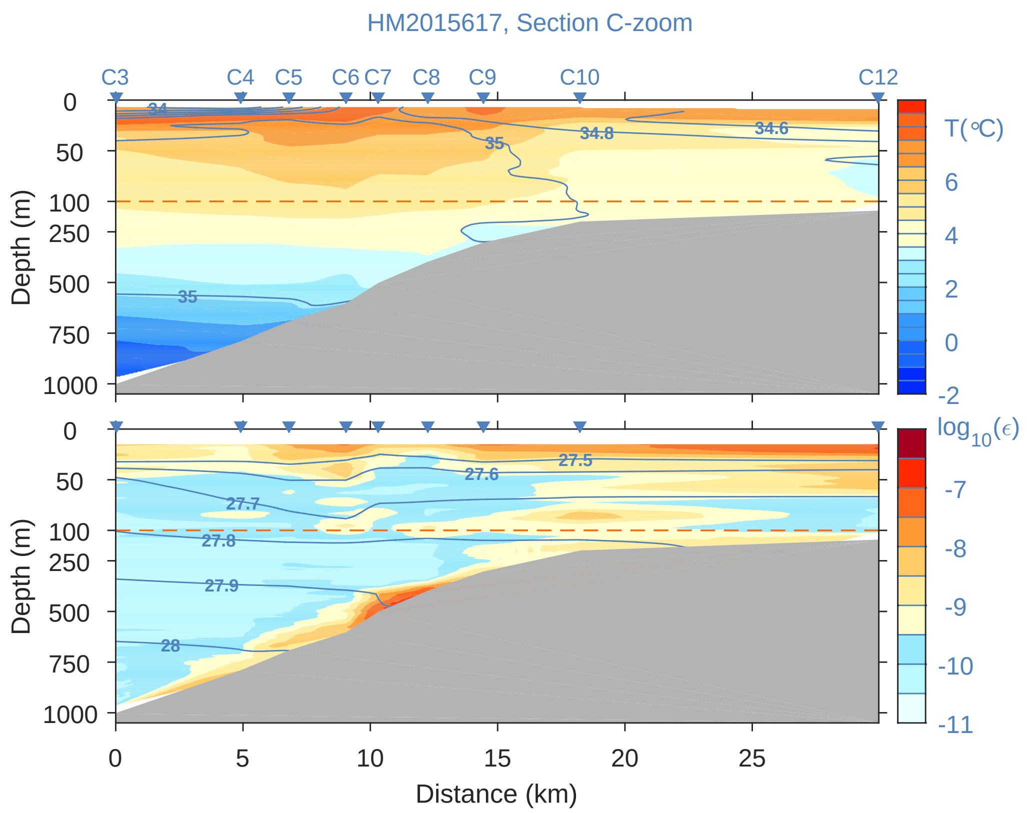


Figure 23. As in Figure 21, but zoom in to the slope stations.

Repeat Station R4. The 17-hour repeat station R4 is occupied near C7. Only VMP is deployed, at hourly intervals. The water depth is approximately 475 m. Ship is re-positioned before each profile. We did not take a CTD station during R4.

Start (UTC)	CTD/LADCP	VMP	VMADCP
18.08 23:11	-	Cast 069	007
19.08 17:01	-	Cast 085	007

VMP cable is terminated between cast 70 and 73 (hence the gap). VMP SBE-C has no data at cast 80 and in the upper 180 m at casts 78 and 86 (the gaps are linearly interpolated in the MATLAB griddata function).

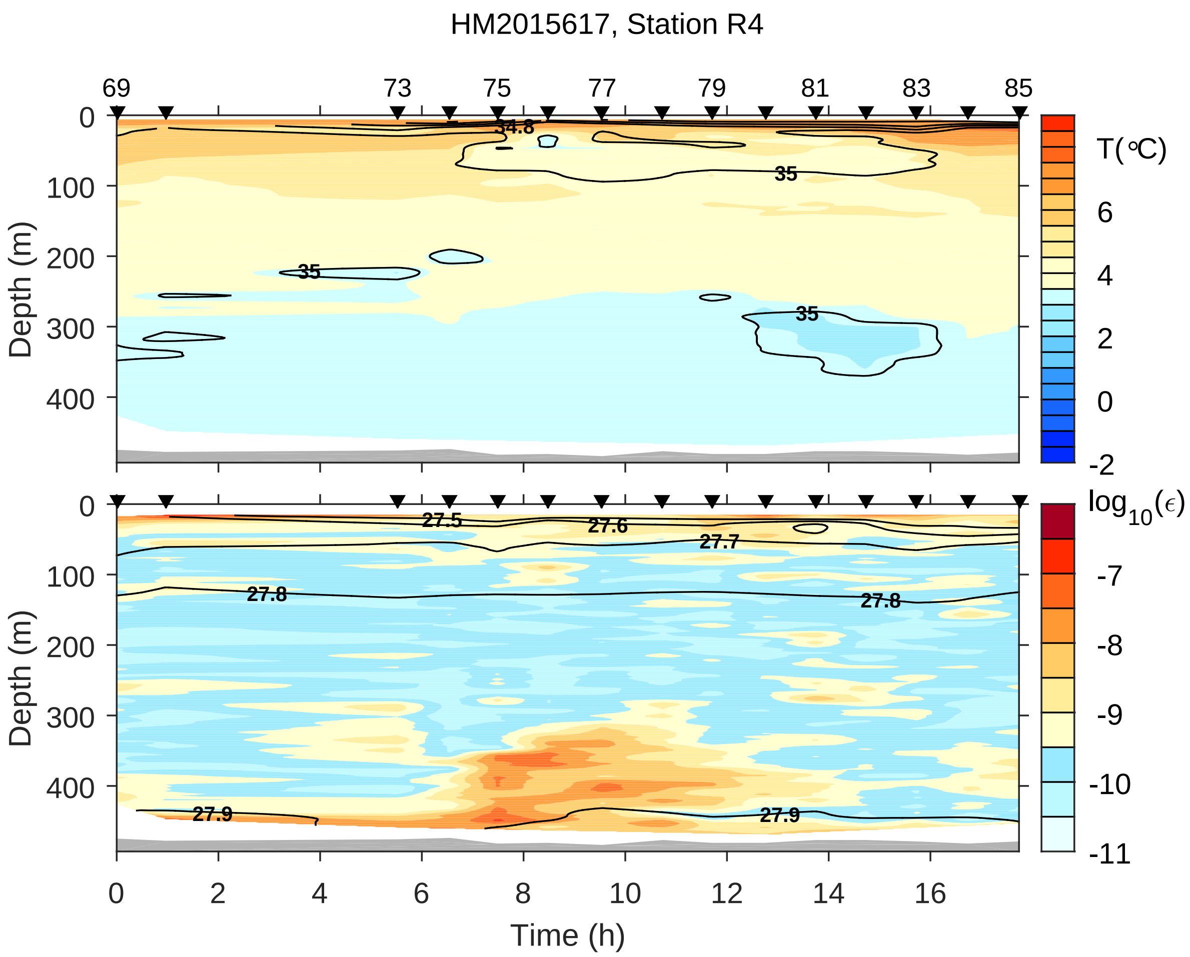


Figure 24. VMP measurements at Station R4. Parameters are as in Figure 10.

9. Appendix A: Cruise Narrative

12 August 2015, Wednesday

RV Håkon Mosby (HM hereafter) departed from Longyearbyen at 10:00 local time (LT = UTC+2h). Transit toward the Yermak Plateau. Calm and sunny day; no waves.

VMP winch is assembled. Using adaptor connectors for the ship's hydraulic we utilize ship's hydraulic and bypass the hydraulic/electric motor which is not properly wired for HM.

The drum of the winch was wagging because of a few loose screws on the slip ring part, on the right side when looking from the driver's view. Too difficult to reach, and we had to partly disassemble the winch, fix and assemble again.

VMP2000 is assembled. Connection confirmed using lab cable and also through the winch cable.

VM-ADCP started logging after 09:14 UTC. Deployment setup is 2015617_BB_BT_on_1000m_8m_bins.txt.

LADCPs installed on rosette. Downward pointing: SN10012 Upward pointing: SN10151

13 August 2015,Thursday

Y2 Mooring recovery: Reached the location of mooring Y2 at 08:50 LT. Took a CTD/LADCP profile prior to recovery (sta0458). All instruments are on deck by 11:05 LT. All instruments are in good shape and their position in the mooring line agrees with the drawing as deployed.

Y3 Mooring recovery: started at 15:00 LT. Took CTD/LADCP (sta0459) before recovery. All on deck at 16:15. All instruments in good shape but note: SBE37 7821 was 1 m above the RDI150 18505 (not 50 m above as in the drawing). The bottom part of the mooring RCM 11064 to release tangled during retrieval.

Y1 Mooring recovery: started at 19:00 LT. Took CTD/LADCP sta0460 before recovery. All on deck by 20:30 LT. All instruments are in good shape and in accord with the drawing as deployed.

14 August 2015, Friday

The entire winch-VMP system is assembled and connected to the ship's hydraulic.

Took a test station at approx. 0700 UTC (vmp cast000)

Started section A from the northern (offshore) end, proceeding southward. At each station ship's CTD is followed by a VMP cast.

Replaced both shear probes after cast 001. (sh1 : M951; sh2: M1293)

Started downloading data from moored RDI ADCP's.

Started downloading data from SBE56's.

15 August 2015, Saturday

Section A completed at 04 UTC

Repeat Station R1 started (near A8) at 06:10 UTC. Only VMP, starting with cast016. Station completed at 18:17 (cast028). Water depth is 690 m. Profiling at hourly intervals.

Downloaded data from 3 Seaguards (all) and 4 RCMs (all, except a fifth which leaked).

Completed downloading data from RDI ADCPs. All ADCPs returned data. In all 4xWH300, 3xWH150 and 3xWH75.

Completed downloading SBE56 data. All but two returned data (SN01342 (Y2) and 01317 (Y1) did not start logging).

16 August 2015, Sunday

Started downloading SBE37 data.

Started Section B (identical to UNIS, REOCIRC Yermak Section) at approx.. 00:00. Started from the onshore end (B1, sta474).

Section B completed (B17, sta490), ca. 13:10.

Repeat Station R2 started at 13:53, near B14. Only VMP is deployed (start with cast029).

17 August 2015, Monday

Repeat Station R2 completed (cast041) at 02:30 UTC

Transit to Section C

18 August 2015, Tuesday

Started Section C (at 01:30 UTC) long 79N18 from the deep / offshore end. CTD/LADCP is followed by VMP. Between CTD and VMP ship is repositioned.

Section C completed at 21:45 UTC (cast068; sta503)

VMP signal shows bad buffers during recovery in the upper 20-30 m, particularly when in air. Too much tension on the cable leading to comm error. Started around cast060.

19 August 2015, Wednesday

Started repeat station R4. VMP only (cast069)

After 2 casts we lose contact with the VMP. We disassemble the instrument and terminate the cable (03-06 LT). We detected a small hole in the cable near where the stress relief ends; apparently too much load at that spot. We applied more protection in the newly terminated cable. Chopped off about 5 m.

Resumed R4 at 4:50 UTC. From and on cast073 is re-terminated cable.

R4 completed at 17:30 UTC. (cast085); Transit toward Isfjord / Nordfjord.

20 August 2015, Thursday

We occupy three stations in Nordfjord, one near its mouth and two along 100 m isobaths close to the two glaciers. We continuously rotate and sample these 3 stations (CTD and then VMP).

Replaced the VMP C-pump with the spare pump.

Completed the 12-h sampling of 3 stations (cast98, 18:37 UTC).

Approached the front of the Sveabreen. The glacier station (N4) was closest to Sveabreen. Wahlenbergbreen is just south of Sveabreen with a point called Muslingodden separating these glacier fronts.

Took station N4 approximately 500 m from the glacier front, and station N5 farther away, along the thalweg at approx. 86 m depth.

Completed the sampling at 23:00 LT; Transit to LYR

21 August 2015, Friday

Arrived at LYR; packing, cleaning etc….; Leave the boat 12:00 LT.

10. Appendix B: List of CTD and VMP stations

Table 3. List of CTD stations. Echo depth is from the ship's echo sounder (corrected for transducer depth and local speed of sound). Each cast has corresponding master/slave LADCP profiles.

Cast	Station Name	Date (UTC)	Time (UTC)	LAT	LON	E. Depth (m)
458	Y2	2015-08-13	06:50	80N03.82	05E48.48	863
459	Y3	2015-08-13	12:31	79N43.70	05E51.10	1327
460	Y1	2015-08-13	15:22	79N37.10	05E55.60	1609
461	A13	2015-08-14	07:17	80N41.88	12E29.70	1317
462	A12	2015-08-14	10:03	80N38.70	12E29.93	1169
463	A11	2015-08-14	12:27	80N35.52	12E29.38	1035
464	A10	2015-08-14	14:35	80N33.57	12E29.12	949
465	A9	2015-08-14	17:05	80N31.08	12E29.59	795
466	A8	2015-08-14	18:52	80N29.95	12E29.50	713
467	A7	2015-08-14	20:30	80N28.49	12E29.54	573
468	A6	2015-08-14	21:45	80N27.64	12E29.42	503
469	A5	2015-08-14	22:53	80N26.93	12E29.55	425
470	A4	2015-08-14	23:59	80N26.03	12E29.52	278
471	A3	2015-08-15	00:51	80N24.96	12E29.71	193
472	A2	2015-08-15	02:02	80N20.61	12E29.74	185
473	A1	2015-08-15	03:11	80N15.64	12E29.61	184
474	B1	2015-08-15	23:59	79N48.12	10E33.07	46
475	B2	2015-08-16	00:08	79N48.48	10E29.93	76
476	B3	2015-08-16	00:23	79N48.70	10E27.86	110
477	B4	2015-08-16	00:41	79N48.99	10E25.61	117
478	B5	2015-08-16	00:58	79N49.20	10E23.97	141
479	B6	2015-08-16	01:12	79N49.30	10E23.39	155
480	B7	2015-08-16	01:30	79N49.40	10E21.65	320
481	B8	2015-08-16	01:59	79N49.92	10E18.35	385
482	B9	2015-08-16	02:31	79N50.67	10E14.23	401
483	B10	2015-08-16	03:17	79N52.46	10E02.59	435
484	B11	2015-08-16	04:14	79N54.75	09E46.83	467
485	B12	2015-08-16	05:11	79N57.42	09E26.16	478
486	B13	2015-08-16	06:13	80N00.22	09E02.08	488
487	B14	2015-08-16	07:17	80N03.83	08E37.32	500
488	B15	2015-08-16	08:30	80N09.13	08E07.31	540
489	B16	2015-08-16	09:49	80N14.71	07E33.01	597
490	B17	2015-08-16	11:12	80N21.01	07E54.05	607
491	R3	2015-08-17	09:44	79N49.44	10E21.81	311
492	C1	2015-08-18	01:09	79N17.95	05E32.82	1822
493	C2	2015-08-18	05:07	79N18.04	06E23.14	1516
494	C3	2015-08-18	09:09	79N18.02	07E33.48	998
495	C4	2015-08-18	12:05	79N18.02	07E46.57	799
496	C5	2015-08-18	13:11	79N18.04	07E52.90	693
497	C6	2015-08-18	14:42	79N18.01	07E59.31	599
498	C7	2015-08-18	16:08	79N17.95	08E02.81	505
499	C8	2015-08-18	17:20	79N17.99	08E08.18	402
500	C9	2015-08-18	18:29	79N18.05	08E14.91	300
501	C10	2015-08-18	19:25	79N18.07	08E25.75	199
502	C11	2015-08-18	20:29	79N18.04	08E44.68	153
503	C12	2015-08-18	21:23	79N18.03	09E00.13	145

Cast	Station Name	Date (UTC)	Time (UTC)	LAT	LON	E. Depth (m)
504	N3	2015-08-20	06:33	78N30.00	14E58.93	178
505	N0	2015-08-20	07:28	78N33.16	15E02.67	102
506	N1	2015-08-20	08:35	78N34.29	14E42.36	105
507	N2	2015-08-20	09:34	78N31.12	14E42.74	114
508	N3	2015-08-20	10:29	78N30.00	14E59.04	179
509	N1	2015-08-20	11:29	78N34.31	14E42.36	104
510	N2	2015-08-20	12:29	78N31.14	14E42.73	113
511	N3	2015-08-20	13:30	78N29.99	14E59.01	179
512	N1	2015-08-20	14:31	78N34.28	14E42.27	106
513	N2	2015-08-20	15:29	78N31.12	14E42.69	114
514	N3	2015-08-20	16:29	78N30.01	14E58.97	179
515	N1	2015-08-20	17:29	78N34.29	14E42.25	106
516	N2	2015-08-20	18:28	78N31.10	14E42.53	113
517	N4	2015-08-20	20:13	78N32.79	14E17.28	46
518	N5	2015-08-20	20:54	78N32.57	14E22.99	87

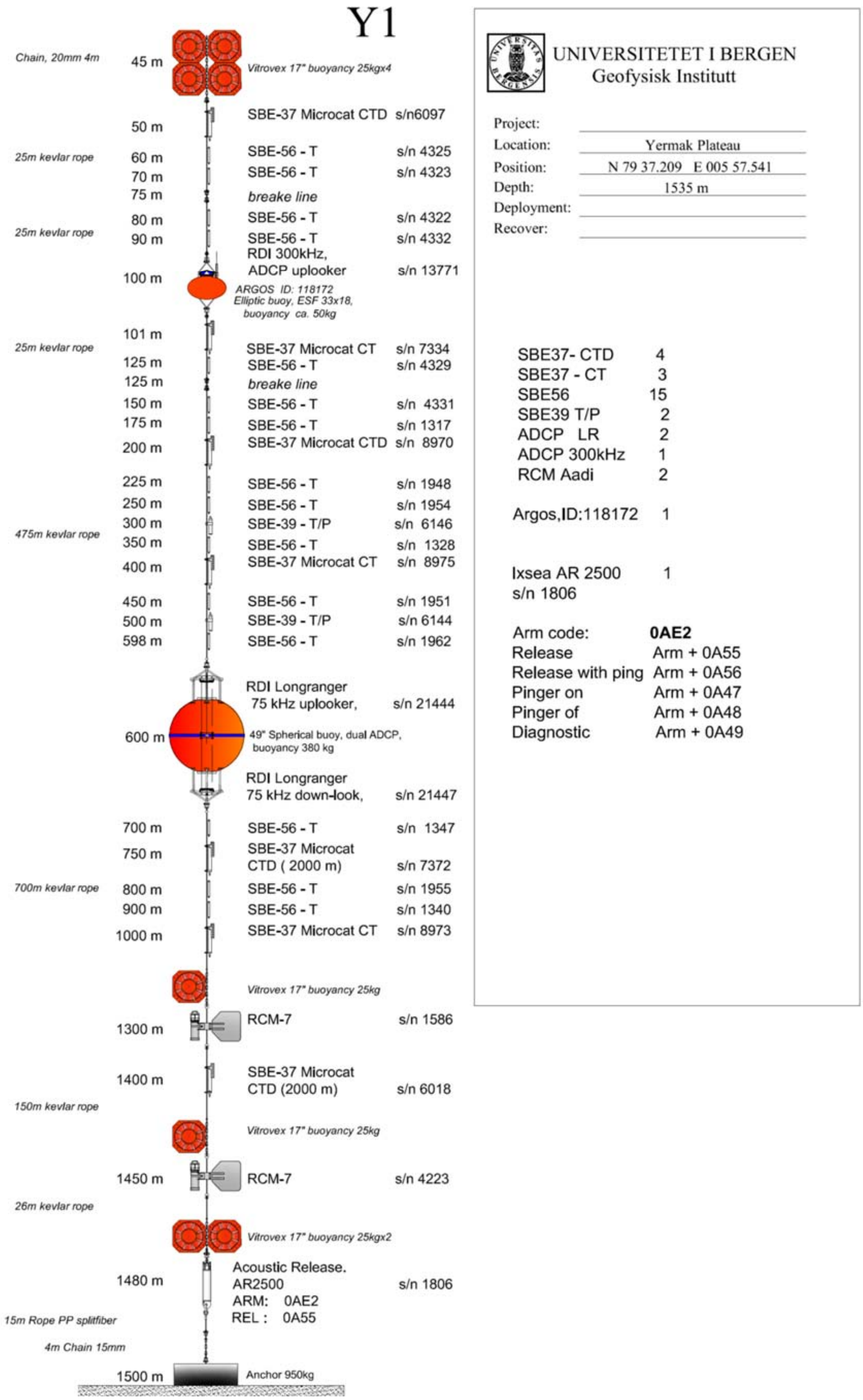
Table 4. List of the VMP deployments. Echo depth is from the ship's echo sounder. Start and end pressures mark the reading on the VMP data acquisition software when started and stopped logging. CTD file is the corresponding ship CTD cast taken before the VMP deployment.

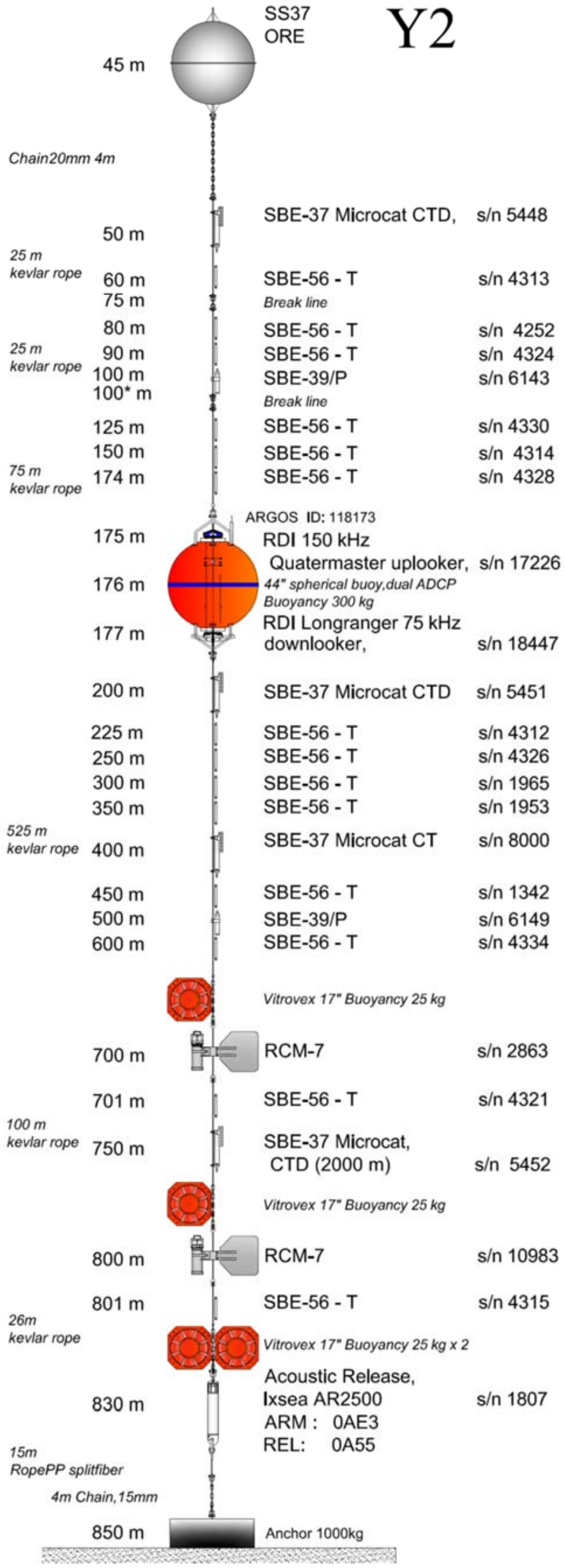
VMP Cast	Station Name	Date (UTC)	Time (UTC)	LAT	LON	E. Depth (m)	Start (dbar)	End (dbar)	CTD File
0	test	2015-08-14	06:54	80N41.59	12E29.09	1306	2.0	110	-
1	A13	2015-08-14	08:28	80N41.91	12E30.06	1315	1.2	1320	461
2	-	-	-	-	-	-	-	-	-
3	A12	2015-08-14	11:26	80N38.70	12E30.16	1170	1.7	881	462
4	A11	2015-08-14	13:25	80N35.52	12E29.35	1035	0.9	947	463
5	A10	2015-08-14	16:00	80N33.77	12E30.77	942	1.3	881	464
6	A9	2015-08-14	17:54	80N31.11	12E29.75	797	1.0	720	465
7	A8	2015-08-14	19:34	80N30.00	12E30.00	713	1.0	719	466
8	A7	2015-08-14	21:02	80N28.50	12E30.00	576	1.0	500	467
9	-	-	-	-	-	-	-	-	-
10	A6	2015-08-14	22:21	80N27.62	12E28.81	498	1.0	422	468
11	A5	2015-08-14	23:25	80N26.97	12E30.86	426	1.5	408	469
12	A4	2015-08-15	00:23	80N26.07	12E29.45	278	0.9	273	470
13	A3	2015-08-15	01:13	80N24.97	12E29.53	194	0.5	189	471
14	A2	2015-08-15	02:16	80N20.62	12E29.64	180	0.4	176	472
15	A1	2015-08-15	03:29	80N15.69	12E29.52	184	1.0	179	473
16	R1	2015-08-15	06:12	80N29.67	12E28.65	693	1.0	612	-
17	R1	2015-08-15	07:17	80N29.67	12E28.84	693	1.4	696	-
18	R1	2015-08-15	08:17	80N29.64	12E28.36	693	1.4	680	-
19	R1	2015-08-15	09:15	80N29.65	12E28.27	691	2.1	662	-
20	R1	2015-08-15	10:17	80N29.65	12E27.98	705	0.5	696	-
21	R1	2015-08-15	11:17	80N29.64	12E27.77	694	0.5	653	-
22	R1	2015-08-15	12:14	80N29.65	12E27.90	694	1.0	661	-
23	R1	2015-08-15	13:15	80N29.64	12E27.78	695	0.5	653	-
24	R1	2015-08-15	14:16	80N29.65	12E27.62	696	0.7	695	-
25	R1	2015-08-15	15:15	80N29.66	12E27.67	695	0.6	671	-
26	R1	2015-08-15	16:17	80N29.62	12E28.94	690	1.5	662	-
27	R1	2015-08-15	17:16	80N29.61	12E28.90	689	1.6	681	-
28	R1	2015-08-15	18:17	80N29.62	12E28.81	689	1.6	672	-
29	R2	2015-08-16	13:53	80N08.37	08E21.39	525	0.5	493	-

VMP Cast	Station Name	Date (UTC)	Time (UTC)	LAT	LON	E. Depth (m)	Start (dbar)	End (dbar)	CTD File
30	R2	2015-08-16	15:01	80N08.16	08E21.17	526	0.5	472	-
31	R2	2015-08-16	16:15	80N08.13	08E20.93	525	1.0	502	-
32	R2	2015-08-16	17:13	80N08.08	08E21.47	525	1.0	499	-
33	R2	2015-08-16	18:13	80N08.16	08E21.11	526	1.3	509	-
34	R2	2015-08-16	19:14	80N08.12	08E21.33	526	1.5	510	-
35	R2	2015-08-16	20:13	80N08.06	08E21.13	523	1.5	513	-
36	R2	2015-08-16	21:15	80N08.07	08E21.23	524	1.0	511	-
37	R2	2015-08-16	22:12	80N21.14	08E19.95	523	0.6	482	-
38	R2	2015-08-16	23:13	80N08.11	08E20.90	525	0.3	509	-
39	R2	2015-08-17	00:12	80N08.10	08E21.13	525	0.5	508	-
40	R2	2015-08-17	01:15	80N08.15	08E21.19	527	0.3	521	-
41	R2	2015-08-17	02:15	80N08.11	08E21.05	525	0.3	509	-
42	R3	2015-08-17	06:15	79N49.49	10E21.90	305	1.5	303	-
43	R3	2015-08-17	07:15	79N49.40	10E21.90	304	2.0	270	-
44	R3	2015-08-17	08:14	79N49.46	10E21.97	304	1.5	287	-
45	R3	2015-08-17	09:13	79N49.46	10E21.90	303	1.2	292	-
46	R3	2015-08-17	10:16	79N49.41	10E21.88	296	0.6	264	491
47	R3	2015-08-17	11:15	79N49.41	10E21.94	291	0.4	285	-
48	R3	2015-08-17	12:12	79N49.43	10E22.11	288	0.2	279	-
49	R3	2015-08-17	13:15	79N49.37	10E21.71	295	0.5	292	-
50	R3	2015-08-17	14:15	79N49.37	10E21.86	301	0.5	292	-
51	R3	2015-08-17	15:13	79N49.39	10E21.96	297	0.4	294	-
52	R3	2015-08-17	16:14	79N49.41	10E21.95	294	1.0	306	-
53	R3	2015-08-17	17:15	79N49.43	10E21.98	298	1.7	302	-
54	R3	2015-08-17	18:12	79N49.39	10E21.78	309	1.0	310	-
55	C1	2015-08-18	02:26	79N18.20	05E31.32	1850	0.2	1460	492
56	-	-	-	-	-	-	-	-	-
57	-	-	-	-	-	-	-	-	-
58	C2	2015-08-18	06:27	79N18.10	06E22.96	1517	1.8	1444	493
59	C3	2015-08-18	10:03	79N18.11	07E32.86	1000	0.7	1004	494
60	C4	2015-08-18	12:11	79N18.00	07E47.19	788	0.5	745	495
61	C5	2015-08-18	13:48	79N18.04	07E52.69	690	0.1	665	496
62	C6	2015-08-18	15:21	79N18.01	07E59.18	601	1.3	588	497
63	C7	2015-08-18	16:37	79N18.03	08E02.88	500	1.9	492	498
64	C8	2015-08-18	17:47	79N18.00	08E08.40	398	2.0	396	499
65	C9	2015-08-18	18:47	79N18.00	08E14.80	302	1.0	293	500
66	C10	2015-08-18	19:39	79N18.00	08E25.89	198	1.9	182	501
67	C11	2015-08-18	20:43	79N17.97	08E44.71	153	1.7	142	502
68	C12	2015-08-18	21:36	79N17.96	09E00.00	144	5.0	135	503
69	R4	2015-08-18	23:11	79N18.15	08E03.50	471	0.5	438	-
70	R4	2015-08-19	00:14	79N17.98	08E03.90	474	0.9	461	-
71	-	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	-	-	-
73	R4	2015-08-19	04:48	79N18.10	08E04.40	472	2.0	472	-
74	R4	2015-08-19	05:50	79N18.00	08E04.02	470	2.0	468	-
75	R4	2015-08-19	06:46	79N17.95	08E03.96	478	1.6	462	-
76	R4	2015-08-19	07:45	79N17.97	08E03.91	477	2.0	474	-
77	R4	2015-08-19	08:50	79N17.97	08E03.84	480	1.6	474	-
78	R4	2015-08-19	10:00	79N17.95	08E03.98	473	7.0	465	-
79	R4	2015-08-19	10:59	79N17.98	08E03.56	477	0.5	465	-
80	R4	2015-08-19	12:01	79N18.00	08E03.91	477	0.5	482	-
81	R4	2015-08-19	13:02	79N18.04	08E03.94	473	0.6	462	-
82	R4	2015-08-19	13:59	79N18.03	08E03.95	473	0.6	465	-

VMP Cast	Station Name	Date (UTC)	Time (UTC)	LAT	LON	E. Depth (m)	Start (dbar)	End (dbar)	CTD File
83	R4	2015-08-19	15:02	79N18.02	08E04.01	475	0.7	472	-
84	R4	2015-08-19	16:01	79N18.01	08E03.87	478	1.5	466	-
85	R4	2015-08-19	17:01	79N18.01	08E04.01	475	2.7	465	-
86	N3	2015-08-20	06:46	78N30.00	14E58.94	178	2.0	175	504
87	N0	2015-08-20	07:37	78N33.15	15E02.65	103	2.0	95	505
88	N1	2015-08-20	08:37	78N34.29	14E42.39	105	1.6	92	506
89	N2	2015-08-20	09:37	78N31.12	14E42.73	112	1.5	104	507
90	N3	2015-08-20	10:43	78N30.01	14E59.05	178	0.5	173	508
91	N1	2015-08-20	11:45	78N34.30	14E42.27	104	0.5	93	509
92	N2	2015-08-20	12:43	78N31.14	14E42.73	111	2.6	98	510
93	N3	2015-08-20	13:43	78N29.99	14E59.04	179	1.9	166	511
94	N1	2015-08-20	14:42	78N34.26	14E42.15	106	1.9	94	512
95	N2	2015-08-20	15:38	78N31.11	14E42.70	114	1.5	107	513
96	N3	2015-08-20	16:40	78N29.98	14E59.07	179	0.7	169	514
97	N1	2015-08-20	17:39	78N34.28	14E42.23	106	1.0	91	515
98	N2	2015-08-20	18:37	78N31.07	14E42.54	113	1.5	102	516
99	N4	2015-08-20	20:21	78N32.79	14E17.30	45	2.0	41	517
100	N4	2015-08-20	20:24	78N32.76	14E17.50	46	2.0	43	-
101	N4	2015-08-20	20:27	78N32.73	14E17.70	50	2.0	43	-
102	N4	2015-08-20	20:30	78N32.71	14E17.95	55	2.0	45	-
103	N4	2015-08-20	20:33	78N32..67	14E18.18	58	2.0	53	-
104	N5	2015-08-20	21:05	78N32.56	14E23.04	86	2.0	81	518
105	N5	2015-08-20	21:10	78N32.51	14E23.20	82	2.0	78	-

11. Appendix C: Mooring drawings





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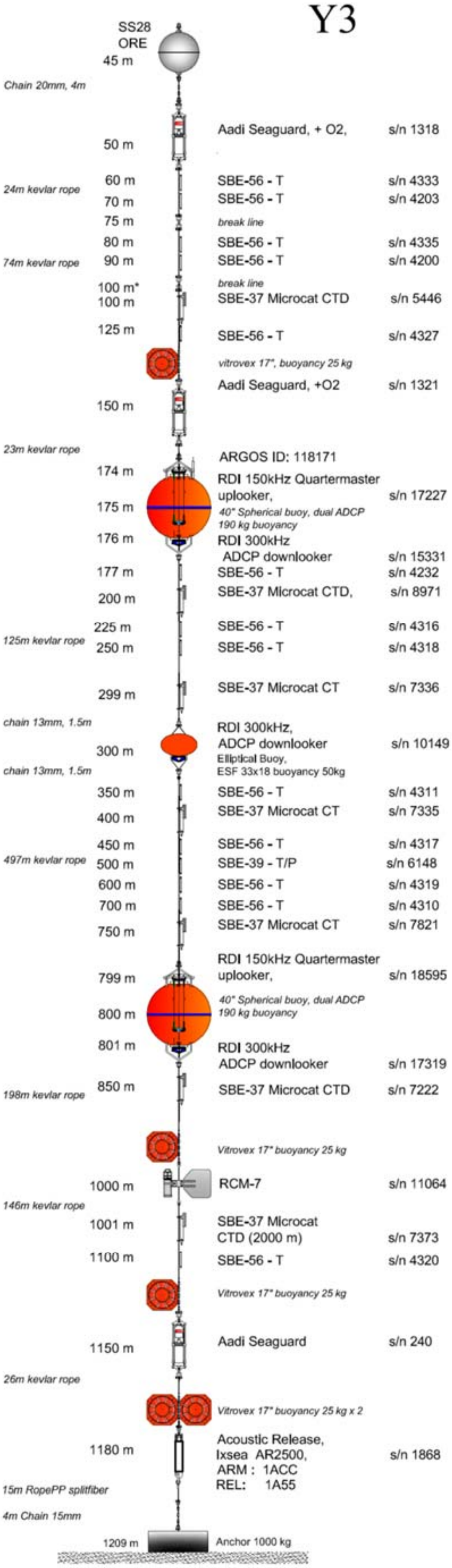
Project:	
Location:	Yermak Plateau
Position:	N 80 03.876 E 005 48.733
Depth:	850 m
Deployment:	
Recover:	

SBE37- CTD	3
SBE37 - CT	1
SBE56	16
ADCP LR	1
ADCP 150kHz	1
RCM Aadi	2
Argos,ID:118173	1
Ixsea AR 2500 s/n 1807	1

Arm code:	**0AE3**
Release	Arm + 0A55
Release with ping	Arm + 0A56
Pinger on	Arm + 0A47
Pinger of	Arm + 0A48
Diagnostic	Arm + 0A49

Y3



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Project:	
Location:	Yermak Plateau
Position:	N 79 44.093 E 005 56.333
Depth:	1209 m
Deployment:	
Recover:	

SBE37- CTD	4
SBE37 - CT	3
SBE56	13
SBE39 T/P	1
ADCP 150kHz	2
ADCP 300kHz	3
RCM-7 Aadi	1
Seaguard Aadi	3

Argos,ID:118171 1

Ixsea AR 2500 1
s/n 1868

Arm code:	1**ACC**
Release	Arm + 1A55
Release with ping	Arm + 1A56
Pinger on	Arm + 1A47
Pinger of	Arm + 1A48
Diagnostic	Arm + 1A49

12. Appendix D: LADCP and VMADCP Deployment Files

Master LADCP deployment file

```
; Append command to the log file
$LC:\HM2015617\ladcp\Mladcp_log.txt
$P *************************************************************************
$P ************** LADCP Master. Looking down (firmware v16.30) *************
$P ************* Master and Slave will ping at the same time ***************
$P ************ taggered single-ping ensembles every 0.8/1.2 s *************
$P *************************************************************************
; Send ADCP a BREAK
$B
; Wait for command prompt (sent after each command)
$W62
; Display real time clock setting
tt?
$W62
; Set to factory defaults
CR1
$W62
; use WM15 for firmware 16.3
; activates LADCP mode (BT from WT pings)
WM15
; Flow control (Record data internally):
; - automatic ensemble cycling (next ens when ready)
; - automatic ping cycling (ping when ready)
; - binary data output
; - disable serial output
; - enable data recorder
CF11101
$W62
; coordinate transformation:
; - radial beam coordinates (2 bits)
; - use pitch/roll (not used for beam coords?)
; - no 3-beam solutions
; - no bin mapping
EX00100
$W62
; Sensor source:
; - manual speed of sound (EC)
; - manual depth of transducer (ED = 0 [dm])
; - measured heading (EH)
; - measured pitch (EP)
; - measured roll (ER)
; - manual salinity (ES = 35 [psu])
; - measured temperature (ET)
EZ0011101
$W62
;
; - configure staggered ping-cycle
; ensembles per burst
TC2
$W62
; pings per ensemble
WP1
$W62
; time per burst
TB 00:00:01.20
$W62
; time per ensemble
TE 00:00:00.80
```

```
$W62
; time between pings
TP 00:00.00
$W62
;
; - configure no. of bins, length, blank
; number of bins
WN015
$W62
; bin length [cm]
WS0800
$W62
; blank after transmit [cm]
WF0000
$W62
; ambiguity velocity [cm]
WV250
$W62
; amplitude and correlation thresholds for bottom detection
LZ30,220
$W62
; Set ADCP to narrow bandwidth and extend range by 10%
LW1
$W62
; Name data file
RN MLADCP
$W62
;
; SET AS MASTER ADCP
SM1
$W62
; TRANSMITS SYNCHRONIZING PULSE BEFORE EACH ENSEMBLE
SA011
$W62
; WAIT .55 s after sending sync pulse
SW05500
$W62
; SYNCHRONIZING PULSE SENT ON EVERY PING
SI0
$W62
; keep params as user defaults (across power failures)
CK
$W62
; echo configuration
T?
$W62
W?
$W62
; start Pinging
CS
; Delay 3 seconds
$D3
$p ****************************************************************************
$P Please disconnect the ADCP from the computer.
$P ****************************************************************************
; Close the log file
$L
```

Slave LADCP deployment file

```
; Append command to the log file
$LC:\HM2015617\ladcp\Sladcp_log.txt
$P ***************************************************************************
$P ************** LADCP SLAVE. Looking UP (firmware v16.30) *************
$P ************* Master and Slave will ping at the same time ***************
$P ************ staggered single-ping ensembles every 0.8/1.2 s ************
$P ***************************************************************************
; Send ADCP a BREAK
$B
% Wait for the command promt; BBTalk needs this before each command
$W62
; Display real time clock setting
tt?
$W62
; Set to factory defaults
CR1
$W62
; use WM15 for firmware 16.3
; activates LADCP mode (BT from WT pings)
WM15
$W62
; Flow control (Record data internally):
; - automatic ensemble cycling (next ens when ready)
; - automatic ping cycling (ping when ready)
; - binary data output
; - disable serial output
; - enable data recorder
CF11101
$W62
; coordinate transformation:
; - radial beam coordinates (2 bits)
; - use pitch/roll (not used for beam coords?)
; - no 3-beam solutions
; - no bin mapping
EX00100
$W62
; Sensor source:
; - manual speed of sound (EC)
; - manual depth of transducer (ED = 0 [dm])
; - measured heading (EH)
; - measured pitch (EP)
; - measured roll (ER)
; - manual salinity (ES = 35 [psu])
; - measured temperature (ET)
EZ0011101
$W62
; - configure staggered ping-cycle
; ensembles per burst
TC2
$W62
; pings per ensemble
WP1
$W62
; time per burst
TB 00:00:01.20
$W62
; time per ensemble
TE 00:00:00.80
$W62
; time between pings
TP 00:00.00
```

```
$W62
;
; - configure no. of bins, length, blank
; number of bins
WN015
$W62
; bin length [cm]
WS0800
$W62
; blank after transmit [cm]
WF0000
$W62
; ambiguity velocity [cm]
WV250
$W62
; amplitude and correlation thresholds for bottom detection
LZ30,220
$W62
; Set ADCP to narrow bandwidth and extend range by 10%
LW1
$W62
; Name data file
RN SLADCP
$W62
;
; SET AS SLAVE ADCP
SM2
$W62
; TRANSMITS SYNCHRONIZING PULSE BEFORE EACH ENSEMBLE
SA011
$W62
; don't sleep
SS0
$W62
; WAIT UP TO 300 SECONDS FOR SYNCHRONIZING PULSE
ST0300
$W62
; keep params as user defaults (across power failures)
CK
$W62
; echo configuration
T?
$W62
W?
$W62
; start Pinging
CS
; Delay 3 seconds
$D3
$p ****************************************************************************
$P Please disconnect the ADCP from the computer.
$P ****************************************************************************
; Close the log file
$L
```

VMADCP deployment file

```
;----------------------------------------------------------------------------\
; ADCP Command File for use with VmDas software.
;
; ADCP type:     75 Khz Ocean Surveyor
; Setup name:    default
; Setup type:    High resolution, short range profile(broadband)
; NOTE:  Any line beginning with a semicolon in the first
;        column is treated as a comment and is ignored by
;        the VmDas software.
; NOTE:  This file is best viewed with a fixed-point font (e.g. courier).
; Modified Last: 20 July 2015 (CoralCarb, Håkon Mosby)
;--------------------------------------------------------------------------/
; Restore factory default settings in the ADCP
cr1
cx1,0    ; cx1,0 external input trigger on,  cx0,0 external input trigger off
; set the data collection baud rate to 38400 bps,
; no parity, one stop bit, 8 data bits
; NOTE:  VmDas sends baud rate change command after all other commands in
; this file, so that it is not made permanent by a CK command.
cb611
; Set for broadband single-ping profile mode (WP), hundred (WN) 8 meter bins (WS),
; 8 meter blanking distance (WF), 390 cm/s ambiguity vel (WV)
NP0
WP001
WN100
WS0800
WF0800
WV390
; Enable single-ping bottom track (BP),
; Set maximum bottom search depth to 1000 meters (BX) (decimeters)
BP001
BX10000
; output velocity, correlation, echo intensity, percent good
WD111100000
; Half second between bottom and water pings
TP000050
; Two seconds between ensembles
; Since VmDas uses manual pinging, TE is ignored by the ADCP.
; You must set the time between ensemble in the VmDas Communication options
TE00000200
; Set to calculate speed-of-sound, no depth sensor, external synchro heading
; sensor, no pitch or roll being used, no salinity sensor, use internal transducer
; temperature sensor
EZ1020001
; Output beam data (rotations are done in software)
EX00000
; Set transducer misalignment (hundredths of degrees)
EA04530
; Set transducer depth (decimeters)
ED00042
; Set Salinity (ppt)
ES35
; save this setup to non-volatile memory in the ADCP
CK
```