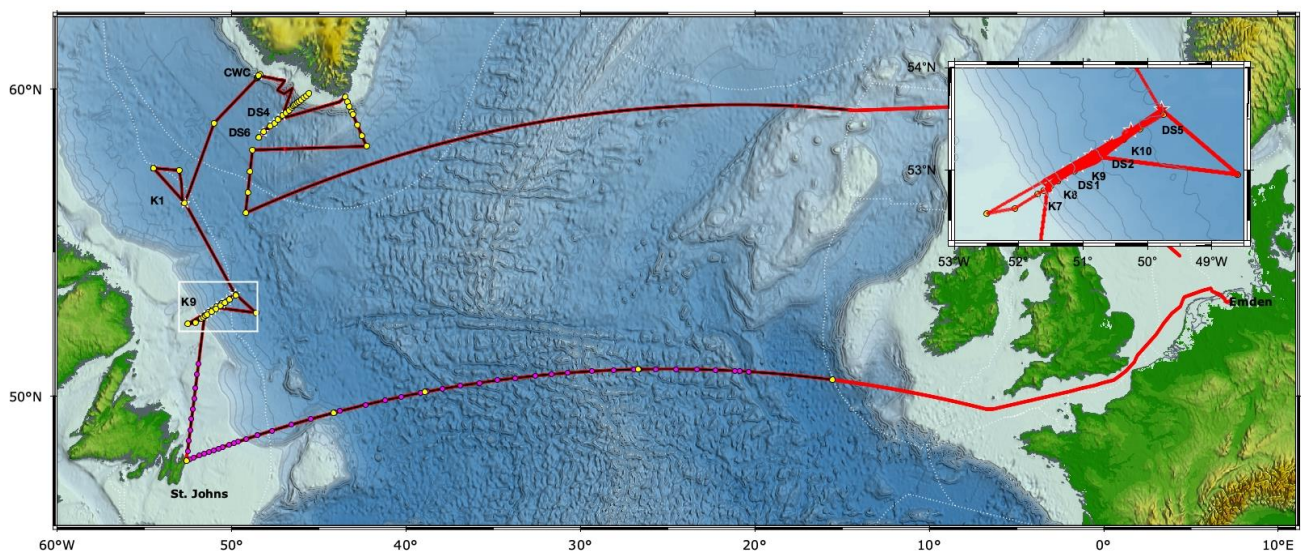


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**Short Cruise Report
R/V MARIA S. MERIAN
Cruise MSM94 (GPF 19-1_104)**

**Emden, Germany – Emden, Germany
02. August – 06. September 2020
Chief scientist: Johannes Karstensen
Captain: Björn Maaß**



RV Maria S. Merian MSM94 cruise track (red) and station overview. Black line: ADCP/TSG Underway data; red dots uCTD; yellow dots: CTD stations; cyan stars: Mooring location

Objectives

The aim of the MSM94 expedition was to collect observational data to study different aspects of water mass transformation and southward transport of water masses in the Deep Western Boundary Current (DWBC) of the western subpolar North Atlantic. The vertical distribution of temperature, salinity, density, oxygen, optical properties and flow velocity was measured along selected sections, the near surface salinity and temperature was continuously monitored with the thermosalinograph, meteorological data was recorded and the flow velocity down to depths exceeding 1000 m was acquired with the ships ADCPs throughout the cruise. Eleven long term steel wire moorings were recovered and redeployed. The expedition contributed to national projects (RACE Synthese), Hemholtz POF and international projects and programs (OSNAP, AtlantOS the program, OFI).

Narrative (all times are Local Time, LT, if not otherwise stated)

R/V MARIA S. MERIAN departed from Emden on Sunday, August 2nd, 2020 08:30 LT. Given that in Emden we moored directly next to the R/V METEOR, the colleagues of the METEOR crew were helping while unmooring the ship. We passed the lock in Emden with many spectators watching us and headed towards the North Sea and the Strait of Dover. The time was used for setting up our equipment in the labs and at deck. The routine ship-familiarization by the 2nd officer was done, also with a safety drill that included entering the life boat. On 3rd August we passed the narrowest part of the Strait of Dover and could watch the famous “White Cliffs of Dover” - well illuminated by the sun. Setting up the equipment continued and in particular the CTD with its multiple sensors was made ready. Weather was fine – calm seas, partly sunny. On August 5th we finally reached international waters and the underway systems (TSG, ADCP, EM122) were started. A shallow (2000m) CTD was done to test the CTD but also to test releaser for the mooring operations and a couple of instruments which had a 2000m depth rating (underway CTD probes, GEOMAR Kiel oxygen logger). Dolphins and whale were spotted. On the 6th August at 13:00 the underway CTD (uCTD) program was started with acquiring a profile every 4 hrs. On the 7th August the second CTD cast was done with many instruments for calibration attached. The uCTD program continued, but failed at one stage because the winch was not running free. The device was cleaned but still it was very difficult to turn in free mode. Throughout the transit preparation for the upcoming mooring work continued. Finally, on the 7th of August we received the diplomatic clearance for the science operations in Canadian Waters and for entering St. Johns for bunkering. The uCTD operations continued to be difficult because of winch and associated rope problems. A meeting was held on the 11th of August between crew and technicians to discuss the general strategy for the station work ahead. In the afternoon a “tour through the engine room” took place. Throughout the cruise we held a daily meeting at 6:30pm.

We arrived on the 12th of August at 7:00 at “Station 27” just in front of St. Johns and did a CTD cast and the data was shortly after shared with F. Cyr (DFO, St. Johns, Canada). At 08:00am the Pilot for St. Johns came on board. During the bunkering operation nobody left the ship for reason of COVID precaution measures. Besides bunkering fuel, some goods were delivered to the ship (pCO₂ sensors from URI, oxygen sensors and a GTD from Dalhousie; Seabird package; Vemko from OTN). We left the port of St. Johns at 12:30 and headed for the 53°N-Array. On the way the uCTD operations continued until the 13th of August, 08:00am. We arrived at the K7 mooring position from the 53°N-Array but low visibility prevented us from mooring recovery. We started CTD operations at selected mooring positions (1nm off positions) during the night. On the 14th of August we recovered the first 3 moorings of the 53°N Array. At night the CTD program continued and also included carbon/nutrient sampling (for OFI, GOSNAP and BSH floats).

After deployment of K9 on the 15th of August we headed southeast for a carbon system calibration cast for an EuroArgo pilot pH/oxygen float (WMO# 3901669) that did profiling shortly before we arrived at the position. The outer most mooring of the 53°N Array (DSOW5) was recovered and directly deployed and also the neighbouring K10 was recovered. The weather conditions were exceptional good during all the operations, calm seas and good visibility. Following the K10 recovery we moved to the southwest part of the section and recovered the last remaining mooring on the 53N Array to recover – K7. This mooring has been composed from German (GEOMAR) and Canadian (DFO) instruments. Starting on the shelf, at about 150m water depth, we did a CTD section across all the 53°N-Array. On-route we deployed K8 and K10 and completed the re-deployment of the 53°N array, as well as occupying a full CTD section across the array.

We then headed northwest and reached the K1 mooring area around mid-day 20th of August and did one full depth CTD for later calibration of moored instruments, and recovered the mooring. We moved northward to occupy a CTD calibration profile for another BSH Biogeochemical Argo float that we deployed in 2018, then we moved southeast and deployed a similar Argo Float. The ship returned to the K1 site and the mooring was deployed on the 21st of August 2020 along with two deep Argo float deployments. We headed northeast towards the position of a bottom lander that was deployed in 2018 (MSM74) off the Greenland coast, near Cape Desolation. On our way we did underway CTD stations and deployed another two deep Argo floats on the 22nd of August but more in the rim current area of the deep convection area. A full depth CTD was also occupied at the location. On the 23rd of August we reached the area where the bottom lander had been installed during MSM74 more than 2 years ago, in 2018. We first did a CTD section from deep waters (>2800m) to the coast aligned with a steep subsea canyon. The flanks of that canyon were further surveyed with the Parasound system before we turned to the lander site. At the site, the release unit was heard and the lander was recovered by noon. The weather conditions were very good, with calm seas and good visibility. For searching the lander drifting at the surface a drone was used. Preliminary inspection of the lander data revealed that the device maybe has fallen down by 25 m within less than 15 minutes (sampling time step of pressure sensor) a couple of months after deployment. Also it looked as if the lander has initially landed in only a marginally stable position as pitch and roll angle showed high frequency variability. We steamed towards the next mooring array, which comprises three short moorings as part of a field of eight more moorings all west of Greenland and part of the OSNAP array. On the way we did two section perpendicular to the topography to deployed in total 50 SVP surface drifter on the 23rd of August. In the morning of the 24th we arrived at the mooring array and recovered the three moorings within one day as the weather conditions were favourite. A CTD section towards Greenland was done and the mooring instruments were calibrated and prepared for the re-deployment of the moorings. We then steamed back to the mooring positions, deployed a last Deep Argo float pair for IFREMER at a position where the topography was 2500m – these floats were the counterparts to the two deep Argo floats deployed at the same depth along the 53°N Array section. In the evening of the 25th of August the DSOW4 mooring was deployed without any problems. During the following CTD cast (#54) electronic problems occurred and the cast was abandoned. As devices needed to be calibrated in deep water (3400m) the cast was repeated making use of a different conductor cable (which was the reason for the failure). After the cast the two remaining moorings were deployed on the 26th of August and three more CTD stations that belong to the OSNAP west section were occupied. We then steamed for a CTD section starting at the southern tip of Greenland, near Cape Farewell, and heading southeast. The sea was calm and we experienced only weak winds.

In the morning of the 27th of August we had good visibility and spotted a research vessel which turned out to be the Danish R/V Dana. We had marine radio contact. During the CTD section the wind and sea increased and hampered our operations. However, we finished the section and moved back to the OSNAP West section but wind and wave made progress rather slow so that, at the end, we could only occupy a part of the remaining CTD station from OSNAP West. On the 29th of August we had to stop the CTD program to start the transit back to Emden. Arrival was scheduled for the 06th of September 08:00am at the pilot station. We choose the northern and shorter route, crossing between Scotland and Shetland Islands before entering the North Sea. Underway recording was stopped on the 2nd of September 2020. The ship progressed well with mostly following seas and free wind. As planned, we arrived in Emden on the 06th of September. We entered the port together with the RV Meteor which arrived from the expedition M165. Our container operations were done on the 08th of September, and along with loading containers for the following cruise (MSM95).

Acknowledgement

We thank Captain Björn Maass, his officers and the crew of R/V MARIA S. MERIAN for their support of our observational program and the hospitality and friendliness on board. We also thank the crew on deck, in the engine rooms and the galley for providing and supporting an excellent working environment. The ship time was provided by the Deutsche Forschungsgemeinschaft within the METEOR/MERIAN core program. We benefited from financial contributions by the research institutions involved.

MSM 94 cruise participants (science crew)

Name	Discipline	Institution
Karstensen, Johannes, Dr.	Fahrtleiter/Chiefs scientist	GEOMAR
Begler, Christian	Mooring lead, telemetry	GEOMAR
Gerke, Lennart Frederik	Oxygen, nutrients respons.	GEOMAR
Handmann, Dr Patricia Vera Klara	Mooring data respons.; CTD respons.	GEOMAR
Hans, Anna Christina	Floats and drifter, uCTD respons.	CAU Kiel
Lösel, Christiane	Underway data/TSG respons.	CAU Kiel
Martens, Wiebke	Microcat; CTD tech.	GEOMAR
Niebaum, Nils Ole	Salinometer respons.	CAU Kiel
Olbricht, Hannah Davina	Mooring technician	GEOMAR
Posern, Conny	vmADCP respons.	CAU Kiel
Rudloff, Daniel	IADCP respons.	CAU Kiel
Witt, René	Mooring technician	GEOMAR
Witting, Paul Jasper	Mooring & MicroCat helper	GEOMAR

Institution

GEOMAR: Helmholtz Zentrum für Ozeanforschung Kiel, Kiel, Germany

CAU Kiel: Christian-Albrechts-Universität Kiel, Kiel, Germany



Science crew participants MSM94 expedition

Station List RV MARIA S. MERIAN MSM94

Gear coding:

CTD: CTD/lowered Acoustic Doppler Current Profiler/UVP and rosette sampler

MOOR: Mooring operation

TSG: Thermosalinograph

EM122: Deep-Sea Multibeam Echosounder

ADCP: Acoustic Doppler Current Profiler

uCTD: Underway CTD

Station No.	Date Time	Gear	Latitude	Longitude	Depth (m)	Remarks
MSM94_0_Underway-1	2020/07/30 10:05:31	Weather-station	53° 21.110' N	007° 11.910' E	36.5	recording start
MSM94_0_Underway-2	2020/08/05 18:00:00	TSG ADCP EM122	65° 43.986' N	005° 21.996' W	2786.2	recording start
MSM94_1-1	2020/08/05 19:10:26	CTD	50° 34.824' N	015° 32.827' W	4205.1	CTD#1
MSM94_2-1	2020/08/06 13:38:55	uCTD	50° 52.343' N	020° 12.649' W	3737.9	Dummy
MSM94_3-1	2020/08/06 14:05:05	uCTD	50° 52.649' N	020° 20.153' W	3969.0	UCTD-01
MSM94_4-1	2020/08/06 16:03:50	uCTD	50° 53.909' N	020° 53.276' W	3169.5	uCTD-02
MSM94_5-1	2020/08/06 17:03:06	uCTD	50° 54.441' N	021° 08.857' W	3268.3	uCTD-03
MSM94_6-1	2020/08/06 21:14:43	uCTD	50° 56.355' N	022° 16.467' W	3649.8	uCTD-04
MSM94_7-1	2020/08/07 01:00:30	uCTD	50° 57.568' N	023° 20.004' W	3715.0	uCTD-05
MSM94_8-1	2020/08/07 05:08:36	uCTD	50° 58.242' N	024° 30.990' W	4090.6	uCTD-06
MSM94_9-1	2020/08/07 09:19:43	uCTD	50° 58.201' N	025° 40.742' W	3753.9	uCTD-07
MSM94_10-1	2020/08/07 12:40:41	uCTD	50° 57.672' N	026° 36.319' W	3607.6	uCTD-08
MSM94_11-1	2020/08/07 14:17:11	uCTD	50° 57.590' N	026° 41.604' W	3630.7	CTD#2
MSM94_12-1	2020/08/07 16:20:29	uCTD	50° 57.605' N	026° 42.405' W	3623.4	uCTD-09
MSM94_13-1	2020/08/07 17:14:40	uCTD	50° 57.372' N	026° 56.427' W	3621.5	uCTD-10
MSM94_14-1	2020/08/07 21:07:38	uCTD	50° 55.888' N	028° 05.793' W	3617.9	uCTD-11
MSM94_15-1	2020/08/08 01:24:38	uCTD	50° 53.525' N	029° 20.357' W	2893.3	uCTD-12
MSM94_16-1	2020/08/08 06:15:35	uCTD	50° 49.943' N	030° 43.745' W	3381.4	uCTD-13
MSM94_17-1	2020/08/08 09:57:47	uCTD	50° 47.058' N	031° 38.120' W	3660.9	uCTD-14
MSM94_18-1	2020/08/08 14:02:29	uCTD	50° 43.557' N	032° 35.611' W	3854.8	uCTD-15
MSM94_19-1	2020/08/08 18:10:40	uCTD	50° 38.778' N	033° 43.601' W	3395.6	uCTD-16
MSM94_20-1	2020/08/08 22:04:48	uCTD	50° 33.913' N	034° 44.548' W	4072.3	uCTD-17
MSM94_21-1	2020/08/09 02:04:33	uCTD	50° 28.364' N	035° 47.041' W	3424.1	uCTD-18
MSM94_22-1	2020/08/09 06:11:37	uCTD	50° 21.891' N	036° 52.792' W	3721.6	uCTD-19
MSM94_23-1	2020/08/09 10:06:31	uCTD	50° 15.332' N	037° 53.521' W	4154.8	uCTD-20
MSM94_24-1	2020/08/09 12:04:42	uCTD	50° 11.781' N	038° 24.394' W	4106.5	no data
MSM94_25-1	2020/08/09 13:24:49	uCTD	50° 09.227' N	038° 45.895' W	4404.8	UCTD-21
MSM94_26-1	2020/08/09 15:22:59	CTD	50° 08.173' N	038° 54.342' W	4326.1	CTD#3
MSM94_27-1	2020/08/09 17:23:37	uCTD	50° 07.818' N	038° 56.620' W	4311.2	uCTD-22
MSM94_28-1	2020/08/09 18:08:10	uCTD	50° 06.663' N	039° 08.315' W	4080.1	uCTD-23
MSM94_29-1	2020/08/09 22:04:22	uCTD	49° 57.799' N	040° 15.491' W	4402.4	uCTD-24
MSM94_30-1	2020/08/10 02:03:13	uCTD	49° 50.130' N	041° 10.720' W	4734.7	uCTD-25
MSM94_31-1	2020/08/10 07:14:50	uCTD	49° 40.130' N	042° 18.109' W	4371.1	uCTD-26 engine of the winch stopped

						working
MSM94_32-1	2020/08/10 13:00:10	uCTD	49° 26.892' N	043° 40.570' W	3940.1	Dummy
MSM94_33-1	2020/08/10 13:23:26	uCTD	49° 25.943' N	043° 46.254' W	3915.5	uCTD-27
MSM94_34-1	2020/08/10 14:30:29	uCTD	49° 22.961' N	044° 03.824' W	3626.7	uCTD-28
MSM94_35-1	2020/08/10 16:07:30	CTD	49° 22.108' N	044° 08.930' W	3491.5	CTD#4
MSM94_36-1	2020/08/10 18:02:03	uCTD	49° 22.022' N	044° 09.541' W	3723.1	uCTD-29
MSM94_37-1	2020/08/10 19:16:46	uCTD	49° 18.504' N	044° 29.572' W	2984.2	UCTD-30 knots in the wire
MSM94_38-1	2020/08/10 23:10:10	uCTD	49° 08.173' N	045° 26.946' W	2491.0	uCTD-31
MSM94_39-1	2020/08/11 03:15:46	uCTD	48° 55.156' N	046° 35.282' W	2709.9	uCTD-32
MSM94_40-1	2020/08/11 07:18:56	uCTD	48° 42.080' N	047° 40.057' W	2362.7	uCTD-33
MSM94_41-1	2020/08/11 11:07:12	uCTD	48° 31.254' N	048° 31.759' W	1714.8	uCTD-34
MSM94_42-1	2020/08/11 14:28:10	uCTD	48° 23.224' N	049° 08.804' W	723.2	uCTD-35
MSM94_43-1	2020/08/11 16:53:53	uCTD	48° 16.911' N	049° 37.213' W	235.9	uCTD-36
MSM94_44-1	2020/08/11 18:02:57	uCTD	48° 13.730' N	049° 51.266' W	205.0	uCTD-37
MSM94_45-1	2020/08/11 19:42:35	uCTD	48° 09.573' N	050° 09.420' W	174.6	uCTD-38
MSM94_46-1	2020/08/11 21:39:51	uCTD	48° 04.627' N	050° 30.705' W	161.3	uCTD-39
MSM94_47-1	2020/08/11 23:00:01	uCTD	48° 01.200' N	050° 45.223' W	124.9	uCTD-40
MSM94_48-1	2020/08/12 00:31:10	uCTD	47° 57.263' N	051° 01.735' W	136.8	uCTD-41
MSM94_49-1	2020/08/12 01:59:01	uCTD	47° 53.432' N	051° 17.604' W	160.1	uCTD-42
MSM94_50-1	2020/08/12 03:31:51	uCTD	47° 49.331' N	051° 34.355' W	156.2	uCTD-43
MSM94_51-1	2020/08/12 05:03:47	uCTD	47° 45.236' N	051° 50.893' W	186.5	uCTD-44
MSM94_52-1	2020/08/12 06:45:56	uCTD	47° 40.644' N	052° 09.191' W	179.8	uCTD-45
MSM94_0_ Underway-3	2020/08/12 07:45:00	TSG ADCP EM122	47° 37.961' N	052° 19.770' W	179.4	3nm Canada
MSM94_53-1	2020/08/12 08:03:56	uCTD	47° 36.956' N	052° 23.050' W	171.8	uCTD-46
MSM94_55-1	2020/08/12 09:39:43	CTD	47° 32.817' N	052° 35.177' W	180.4	CTD#5
MSM94_0_ Underway-3	2020/08/12 16:35:00	TSG ADCP EM122	47° 48.156' N	052° 32.776' W	174.6	Outside 3nm Canada
MSM94_56-1	2020/08/12 17:10:06	uCTD	47° 55.596' N	052° 31.113' W	186.5	uCTD-47
MSM94_57-1	2020/08/12 19:02:21	uCTD	48° 18.961' N	052° 26.570' W	202.5	uCTD-48
MSM94_58-1	2020/08/12 21:01:53	uCTD	48° 43.136' N	052° 21.896' W	269.3	uCTD-49
MSM94_59-1	2020/08/12 23:08:08	uCTD	49° 07.984' N	052° 17.248' W	323.2	uCTD-50
MSM94_60-1	2020/08/13 01:00:41	uCTD	49° 30.284' N	052° 12.968' W	331.1	uCTD-51
MSM94_61-1	2020/08/13 03:02:28	uCTD	49° 54.398' N	052° 08.297' W	286.1	uCTD-52
MSM94_62-1	2020/08/13 05:00:40	uCTD	50° 17.519' N	052° 03.780' W	249.4	uCTD-53
MSM94_63-1	2020/08/13 07:19:09	uCTD	50° 46.186' N	051° 58.114' W	218.7	uCTD-54
MSM94_64-1	2020/08/13 09:07:05	uCTD	51° 09.123' N	051° 53.558' W	230.7	uCTD-55
MSM94_65-1	2020/08/13 18:17:32	CTD	52° 51.180' N	051° 31.789' W	1451.7	CTD#6
MSM94_66-1	2020/08/13 20:41:59	CTD	52° 58.340' N	051° 18.050' W	2271.2	CTD#7
MSM94_67-1	2020/08/13 23:19:27	CTD	53° 03.808' N	051° 04.047' W	2629.2	CTD#8
MSM94_68-1	2020/08/14 02:09:08	CTD	53° 09.222' N	050° 51.739' W	2892.7	CTD#9
MSM94_69-1	2020/08/14 05:56:28	CTD	53° 16.387' N	050° 33.258' W	3159.0	CTD#10
MSM94_70-1	2020/08/14 09:10:20	Mooring	53° 02.377' N	051° 04.465' W	2593.6	DSOW1 released
MSM94_71-1	2020/08/14 12:18:13	Mooring	53° 07.738' N	050° 51.918' W	2914.8	K9 released

MSM94_72-1	2020/08/14 16:34:06	Mooring	53° 14.934' N	050° 32.951' W	0.0	DSOW2 released
MSM94_73-1	2020/08/14 21:26:17	CTD	53° 22.279' N	050° 14.510' W	3401.2	CTD#11
MSM94_74-1	2020/08/15 01:49:55	CTD	53° 34.699' N	049° 45.758' W	3763.3	CTD#12
MSM94_75-1	2020/08/15 11:07:31	Mooring	52° 57.074' N	051° 17.855' W	2206.7	K8 / KPO 1186 released
MSM94_76-1	2020/08/15 16:01:42	Mooring	53° 02.884' N	051° 04.877' W	2605.2	DSOW1 deployed
MSM94_77-1	2020/08/15 19:43:53	Mooring	53° 08.039' N	050° 52.015' W	2895.6	K9 deployed
MSM94_78-1	2020/08/16 03:52:10	CTD	52° 57.201' N	048° 35.990' W	3731.2	CTD#13 Float calib.
MSM94_79-1	2020/08/16 11:03:06	Mooring	53° 35.222' N	049° 46.342' W	3608.3	DSOW5 released
MSM94_80-1	2020/08/16 13:51:03	Mooring	53° 35.673' N	049° 47.040' W	3604.3	DSOW5 deployed
MSM94_81-1	2020/08/16 15:59:32	Mooring	53° 22.965' N	050° 14.436' W	3422.6	K10 released
MSM94_82-1	2020/08/16 23:15:55	CTD	53° 15.403' N	050° 33.229' W	3167.0	CTD#14
MSM94_83-1	2020/08/17 10:00:39	Mooring	52° 49.895' N	051° 32.798' W	1256.1	K7 released
MSM94_84-1	2020/08/17 15:54:06	Mooring	52° 50.621' N	051° 33.101' W	1390.3	K7 deployed
MSM94_85-1	2020/08/17 20:31:10	Mooring	started	53° 15.493' N	332.1	DSOW2 deployed
MSM94_86-1	2020/08/17 22:40:44	CTD	53° 16.286' N	050° 33.893' W	3164.5	CTD#15
MSM94_87-1	2020/08/18 07:29:32	CTD	52° 33.912' N	052° 29.785' W	259.8	CTD#16
MSM94_88-1	2020/08/18 07:56:03	uCTD	52° 34.449' N	052° 25.409' W	271.0	uCTD-56
MSM94_89-1	2020/08/18 08:39:06	uCTD	52° 36.108' N	052° 11.642' W	300.2	uCTD-57
MSM94_90-1	2020/08/18 09:27:42	CTD	52° 37.108' N	052° 03.382' W	301.1	CTD#17
MSM94_91-1	2020/08/18 09:47:18	uCTD	52° 37.706' N	052° 01.902' W	303.2	uCTD-58
MSM94_92-1	2020/08/18 10:25:17	uCTD	52° 41.831' N	051° 51.680' W	308.3	uCTD-59
MSM94_93-1	2020/08/18 11:24:17	CTD	52° 45.496' N	051° 42.517' W	1011.2	CTD#18
MSM94_94-1	2020/08/18 12:33:10	CTD	52° 47.734' N	051° 36.703' W	1006.8	CTD#19
MSM94_95-1	2020/08/18 14:03:42	CTD	52° 50.643' N	051° 29.810' W	1470.4	CTD#20
MSM94_96-1	2020/08/18 15:51:14	CTD	52° 53.207' N	051° 23.398' W	1979.0	CTD#21
MSM94_97-1	2020/08/18 19:16:41	Mooring	52° 57.681' N	051° 18.493' W	2228.1	K8 deployed
MSM94_98-1	2020/08/18 21:00:04	CTD	52° 59.359' N	051° 08.177' W	2418.9	CTD#22
MSM94_99-1	2020/08/18 21:49:29	Float	52° 59.414' N	051° 08.130' W	2418.3	
MSM94_100-1	2020/08/18 21:50:02	Float	52° 59.439' N	051° 08.121' W	2424.3	
MSM94_101-1	2020/08/18 23:55:10	CTD	53° 05.529' N	050° 52.917' W	2902.2	CTD#23
MSM94_102-1	2020/08/19 02:57:22	CTD	53° 11.697' N	050° 37.638' W	3156.1	CTD#24
MSM94_103-1	2020/08/19 06:04:53	CTD	53° 17.887' N	050° 22.330' W	3305.8	CTD#25
MSM94_104-1	2020/08/19 12:17:55	Mooring	53° 23.241' N	050° 15.662' W	3361.4	K10 deployed/ KPO1225
MSM94_105-1	2020/08/19 13:59:56	CTD	53° 24.014' N	050° 07.115' W	3479.6	CTD#26
MSM94_106-1	2020/08/19 17:43:21	CTD	53° 32.521' N	049° 45.196' W	3594.3	CTD#27
Information	2020/08/20 14:15:14	EM122			3364	Changed device (serial #999)
MSM94_107-1	2020/08/20 14:15:14	CTD	55°42.796' N	051°48.920' W		
MSM94_107-1	2020/08/20 14:15:14	CTD	56° 34.267' N	052° 40.950' W	3485.9	CTD#28
MSM94_108-1	2020/08/20 15:42:45	Mooring	56° 33.954' N	052° 40.245' W	3484.8	K1 released

MSM94_109-1	2020/08/21 01:58:52	CTD	57° 39.134' N	054° 28.394' W	3313.3	CTD#29
MSM94_109-2	2020/08/21 04:07:49	CTD	57° 39.138' N	054° 28.399' W	3314.1	CTD#30
MSM94_110-1	2020/08/21 11:36:24	CTD	57° 35.015' N	053° 00.039' W	3471.8	CTD#31
MSM94_111-1	2020/08/21 12:57:18	Float	57° 34.937' N	053° 00.000' W	3469.2	Float deployed
MSM94_112-1	2020/08/21 22:54:14	Mooring	56° 34.202' N	052° 38.446' W	3494.0	K1 deployed
MSM94_113-1	2020/08/21 23:08:59	uCTD	56° 33.914' N	052° 41.057' W	3487.6	uCTD-60
MSM94_114-1	2020/08/21 23:25:20	Float	56° 33.410' N	052° 44.072' W	3482.6	Float deployed
MSM94_115-1	2020/08/21 23:26:46	Float	56° 33.357' N	052° 44.083' W	3486.7	Float deployed
MSM94_116-1	2020/08/22 01:08:15	uCTD	56° 49.904' N	052° 29.814' W	3503.6	uCTD-61
MSM94_117-1	2020/08/22 03:03:36	uCTD	57° 10.395' N	052° 15.480' W	3503.1	uCTD-62
MSM94_118-1	2020/08/22 05:04:46	uCTD	57° 32.418' N	052° 00.618' W	3525.2	uCTD-63
MSM94_119-1	2020/08/22 07:18:21	uCTD	57° 56.999' N	051° 43.871' W	3450.8	uCTD-64
MSM94_120-1	2020/08/22 09:04:46	uCTD	58° 16.624' N	051° 30.328' W	3523.3	uCTD-65
MSM94_121-1	2020/08/22 11:05:05	uCTD	58° 38.835' N	051° 14.876' W	3514.1	uCTD-66
MSM94_122-1	2020/08/22 12:43:32	uCTD	58° 57.405' N	051° 01.926' W	3498.8	uCTD-67
MSM94_123-1	2020/08/22 14:13:39	CTD	59° 00.004' N	051° 00.027' W	3501.4	CTD#32
MSM94_123-2	2020/08/22 16:18:16	Float	59° 00.008' N	050° 59.878' W	3501.9	Float deployed
MSM94_123-3	2020/08/22 16:19:03	Float	59° 00.009' N	050° 59.814' W	3500.1	Float deployed
MSM94_124-1	2020/08/22 16:26:51	uCTD	59° 00.619' N	050° 58.617' W	3499.8	uCTD-68
MSM94_125-1	2020/08/22 16:57:25	uCTD	59° 04.448' N	050° 51.890' W	3496.8	uCTD-69
MSM94_126-1	2020/08/22 19:08:46	uCTD	59° 23.841' N	050° 15.743' W	3449.8	uCTD-70
MSM94_127-1	2020/08/22 21:15:39	uCTD	59° 40.238' N	049° 44.585' W	3337.3	uCTD-71
MSM94_128-1	2020/08/22 23:05:21	uCTD	59° 56.592' N	049° 13.239' W	3085.2	uCTD-72
	2020/08/23 00:09	uCTD	60° 03.288' N	049° 00.456' W	2977	uCTD-73
MSM94_129-1	2020/08/23 01:12:07	uCTD	60° 09.890' N	048° 47.576' W	2887.4	UCTD-74
MSM94_130-1	2020/08/23 03:07:52	CTD	60° 18.277' N	048° 31.954' W	2702.1	CTD#33
MSM94_131-1	2020/08/23 05:06:49	CTD	60° 19.615' N	048° 30.051' W	2466.5	CTD#34
MSM94_132-1	2020/08/23 06:54:37	CTD	60° 20.674' N	048° 28.412' W	2101.1	CTD#35
MSM94_133-1	2020/08/23 08:27:08	CTD	60° 21.506' N	048° 26.825' W	1700.4	CTD#36
MSM94_134-1	2020/08/23 09:47:18	CTD	60° 23.400' N	048° 24.819' W	1014.1	CTD#37
MSM94_135-1	2020/08/23 10:46:40	CTD	60° 24.660' N	048° 22.131' W	479.8	CTD#38
MSM94_136-1	2020/08/23 12:45:19	CTD	60° 22.529' N	048° 27.722' W	591.2	CTD#39
MSM94_137-1	2020/08/23 14:16:27	Lander	60° 22.725' N	048° 27.871' W	628.0	Lander recovered
MSM94_138-1	2020/08/23 18:12:51	Drifter	60° 13.846' N	046° 57.343' W	468.3	Drifter1
MSM94_139-1	2020/08/23 18:35:25	Drifter	60° 11.196' N	047° 00.901' W	367.0	Drifter2
MSM94_140-1	2020/08/23 18:37:16	Drifter	60° 11.136' N	047° 01.045' W	363.2	Drifter3
MSM94_141-1	2020/08/23 18:39:49	Drifter	60° 11.026' N	047° 01.156' W	362.1	Drifter4
MSM94_142-1	2020/08/23 18:42:07	Drifter	60° 10.925' N	047° 01.255' W	358.9	Drifter5
MSM94_143-1	2020/08/23 19:01:58	Drifter	60° 08.827' N	047° 04.164' W	348.0	Drifter6
MSM94_144-1	2020/08/23 19:03:57	Drifter	60° 08.734' N	047° 04.275' W	399.9	Drifter7
MSM94_145-1	2020/08/23 19:05:36	Drifter	60° 08.664' N	047° 04.348' W	419.9	Drifter8
MSM94_146-1	2020/08/23 19:07:07	Drifter	60° 08.610' N	047° 04.433' W	452.5	Drifter9
MSM94_147-1	2020/08/23 19:30:51	Drifter	60° 06.072' N	047° 08.141' W	838.0	Drifter10
MSM94_148-1	2020/08/23 19:32:18	Drifter	60° 05.996' N	047° 08.249' W	855.9	Drifter11
MSM94_149-1	2020/08/23 19:33:51	Drifter	60° 05.920' N	047° 08.378' W	882.2	Drifter12

MSM94_150-1	2020/08/23 19:34:59	Drifter	60° 05.869' N	047° 08.475' W	904.2	Drifter13
MSM94_151-1	2020/08/23 20:08:07	Drifter	60° 02.415' N	047° 14.410' W	1263.1	Drifter14
MSM94_152-1	2020/08/23 20:09:54	Drifter	60° 02.346' N	047° 14.549' W	1306.7	Drifter15
MSM94_153-1	2020/08/23 20:12:26	Drifter	60° 02.254' N	047° 14.732' W	1366.4	Drifter16
MSM94_154-1	2020/08/23 20:14:21	Drifter	60° 02.192' N	047° 14.867' W	1376.4	Drifter17
MSM94_155-1	2020/08/23 20:36:32	Drifter	60° 00.248' N	047° 17.649' W	1738.7	Drifter18
MSM94_156-1	2020/08/23 20:38:27	Drifter	60° 00.165' N	047° 17.807' W	1789.2	Drifter19
MSM94_157-1	2020/08/23 20:40:23	Drifter	60° 00.086' N	047° 17.961' W	1902.9	Drifter20
MSM94_158-1	2020/08/23 20:42:07	Drifter	60° 00.016' N	047° 18.102' W	1939.2	Drifter21
MSM94_159-1	2020/08/23 21:04:21	Drifter	59° 57.815' N	047° 21.759' W	2627.4	Drifter22
MSM94_160-1	2020/08/23 21:06:14	Drifter	59° 57.727' N	047° 21.912' W	2639.7	Drifter23
MSM94_161-1	2020/08/23 21:07:44	Drifter	59° 57.664' N	047° 22.017' W	2647.6	Drifter24
MSM94_162-1	2020/08/23 21:09:12	Drifter	59° 57.604' N	047° 22.074' W	2649.4	Drifter25
MSM94_163-1	2020/08/23 22:19:38	Drifter	59° 51.373' N	046° 58.716' W	2521.2	Drifter26
MSM94_164-1	2020/08/23 22:22:07	Drifter	59° 51.425' N	046° 58.566' W	2505.6	Drifter27
MSM94_165-1	2020/08/23 22:24:18	Drifter	59° 51.467' N	046° 58.430' W	2478.6	Drifter28
MSM94_166-1	2020/08/23 22:26:16	Drifter	59° 51.504' N	046° 58.306' W	2460.5	Drifter29
MSM94_167-1	2020/08/23 22:46:54	Drifter	59° 52.817' N	046° 54.110' W	1984.5	Drifter30
MSM94_168-1	2020/08/23 22:48:55	Drifter	59° 52.857' N	046° 53.973' W	1934.9	Drifter31
MSM94_169-1	2020/08/23 22:50:43	Drifter	59° 52.891' N	046° 53.848' W	1864.0	Drifter32
MSM94_170-1	2020/08/23 22:53:13	Drifter	59° 52.933' N	046° 53.675' W	1840.5	Drifter33
MSM94_171-1	2020/08/23 23:12:35	Drifter	59° 54.296' N	046° 49.495' W	1656.7	Drifter34
MSM94_172-1	2020/08/23 23:14:09	Drifter	59° 54.324' N	046° 49.402' W	1647.7	Drifter35
MSM94_173-1	2020/08/23 23:15:58	Drifter	59° 54.362' N	046° 49.295' W	1640.3	Drifter36
MSM94_174-1	2020/08/23 23:17:32	Drifter	59° 54.396' N	046° 49.197' W	1634.9	Drifter37
MSM94_175-1	2020/08/23 23:36:23	Drifter	59° 55.793' N	046° 44.898' W	1272.0	Drifter38
MSM94_176-1	2020/08/23 23:38:25	Drifter	59° 55.827' N	046° 44.775' W	1261.8	Drifter39
MSM94_177-1	2020/08/23 23:39:56	Drifter	59° 55.854' N	046° 44.678' W	1270.1	Drifter40
MSM94_178-1	2020/08/23 23:42:02	Drifter	59° 55.892' N	046° 44.537' W	1269.9	Drifter41
MSM94_179-1	2020/08/24 00:00:40	Drifter	59° 57.320' N	046° 40.216' W	917.3	Drifter42
MSM94_180-1	2020/08/24 00:02:12	Drifter	59° 57.355' N	046° 40.116' W	910.1	Drifter43
MSM94_181-1	2020/08/24 00:04:21	Drifter	59° 57.403' N	046° 39.973' W	897.6	Drifter44
MSM94_182-1	2020/08/24 00:06:05	Drifter	59° 57.440' N	046° 39.850' W	887.3	Drifter45
MSM94_183-1	2020/08/24 00:26:33	Drifter	59° 58.775' N	046° 35.654' W	444.1	Drifter46
MSM94_184-1	2020/08/24 00:28:39	Drifter	59° 58.809' N	046° 35.524' W	424.3	Drifter47
MSM94_185-1	2020/08/24 00:30:32	Drifter	59° 58.847' N	046° 35.406' W	405.2	Drifter48
MSM94_186-1	2020/08/24 00:31:36	Drifter	59° 58.877' N	046° 35.343' W	389.5	Drifter49
MSM94_187-1	2020/08/24 00:49:32	Drifter	60° 00.281' N	046° 31.545' W	166.4	Drifter50
MSM94_188-1	2020/08/24 06:07:39	CTD	59° 13.888' N	047° 03.937' W	2927.8	CTD#40
MSM94_189-1	2020/08/24 09:51:30	CTD	58° 59.917' N	047° 32.140' W	3108.0	CTD#41
MSM94_190-1	2020/08/24 13:05:04	Mooring	58° 43.664' N	048° 09.348' W	3358.8	DSOW 6 / KPO 1206 released
MSM94_191-1	2020/08/24 16:35:30	Mooring	59° 00.309' N	047° 34.741' W	3095.9	DSOW3 released
MSM94_192-1	2020/08/24 19:25:51	Mooring	59° 12.412' N	047° 05.223' W	2940.4	DSOW4 released
MSM94_193-1	2020/08/24 22:23:21	CTD	59° 18.719' N	046° 52.587' W	2474.1	CTD#42
MSM94_194-1	2020/08/25 01:47:40	CTD	59° 22.785' N	046° 41.965' W	2153.4	CTD#43
MSM94_195-1	2020/08/25 03:59:01	CTD	59° 27.218' N	046° 32.208' W	2025.2	CTD#44

MSM94_196-1	2020/08/25 06:46:15	CTD	59° 30.310' N	046° 27.332' W	2199.3	CTD#45
MSM94_197-1	2020/08/25 08:27:29	CTD	59° 32.390' N	046° 23.324' W	1767.6	CTD#46
MSM94_198-1	2020/08/25 10:01:10	CTD	59° 34.209' N	046° 18.187' W	1316.4	CTD#47
MSM94_199-1	2020/08/25 11:25:16	CTD	59° 36.449' N	046° 11.976' W	905.4	CTD#48
MSM94_200-1	2020/08/25 12:28:45	CTD	59° 38.250' N	046° 06.920' W	594.4	CTD#49
MSM94_201-1	2020/08/25 13:27:21	CTD	59° 40.967' N	045° 59.841' W	209.9	CTD#50
MSM94_202-1	2020/08/25 14:28:53	CTD	59° 44.867' N	045° 50.164' W	170.1	CTD#51
MSM94_203-1	2020/08/25 15:26:56	CTD	59° 48.300' N	045° 41.878' W	153.9	CTD#52
MSM94_204-1	2020/08/25 16:21:40	CTD	59° 51.879' N	045° 33.530' W	124.7	CTD#53
MSM94_205-1	2020/08/25 16:43:00	uCTD	59° 50.553' N	045° 36.747' W	139.9	uCTD-75
MSM94_206-1	2020/08/25 20:25:43	Float	59° 18.568' N	046° 53.446' W	2499.9	Float deployed
MSM94_207-1	2020/08/25 20:26:26	Float	59° 18.537' N	046° 53.528' W	2500.4	Float deployed
MSM94_208-1	2020/08/25 22:08:47	Mooring	59° 12.863' N	047° 05.001' W	2944.6	DSOW4 deployed
MSM94_209-2	2020/08/26 05:25:45	CTD	58° 34.478' N	048° 25.296' W	3493.0	CTD#54 technical problems
MSM94_210-1	2020/08/26 08:04:23	CTD	58° 34.476' N	048° 25.297' W	3493.4	CTD#55
MSM94_211-1	2020/08/26 11:03:35	Mooring	58° 44.089' N	048° 10.063' W	3363.4	DSOW6/K PO 1230 deployed
MSM94_212-1	2020/08/26 13:59:22	Mooring	59° 00.541' N	047° 33.940' W	3109.3	DSOW3/K PO1227 deployed
MSM94_213-1	2020/08/26 17:25:18	CTD	58° 44.998' N	048° 09.532' W	3354.3	CTD#56
MSM94_214-1	2020/08/26 21:37:36	CTD	58° 54.901' N	047° 46.334' W	3163.4	CTD#57
MSM94_215-1	2020/08/27 01:01:48	CTD	59° 06.404' N	047° 20.131' W	2936.8	CTD#58
MSM94_216-1	2020/08/27 12:17:15	CTD	59° 46.006' N	043° 28.149' W	158.6	CTD#59
MSM94_217-1	2020/08/27 13:40:01	CTD	59° 37.255' N	043° 21.297' W	179.9	CTD#60
MSM94_218-1	2020/08/27 15:00:45	CTD	59° 29.099' N	043° 14.123' W	474.4	CTD#61
MSM94_219-1	2020/08/27 16:41:45	CTD	59° 20.085' N	043° 06.495' W	1014.1	CTD#62
MSM94_220-1	2020/08/27 18:18:01	CTD	59° 15.515' N	043° 02.796' W	1510.6	CTD#63
MSM94_221-1	2020/08/27 21:17:54	CTD	58° 56.676' N	042° 46.900' W	1931.0	CTD#64
MSM94_222-1	2020/08/28 00:33:44	CTD	58° 37.771' N	042° 31.261' W	2467.0	CTD#65
MSM94_223-1	2020/08/28 04:50:14	CTD	58° 19.183' N	042° 15.443' W	2916.2	CTD#66
MSM94_224-1	2020/08/29 00:41:35	CTD	58° 12.009' N	048° 47.992' W	3468.2	CTD#67
MSM94_225-1	2020/08/29 06:28:52	CTD	57° 33.013' N	048° 55.938' W	3492.5	CTD#68
MSM94_226-1	2020/08/29 12:10:34	CTD	56° 54.006' N	049° 03.860' W	3634.1	CTD#69
MSM94_227-1	2020/08/29 18:14:42	CTD	56° 15.337' N	049° 10.976' W	3688.6	CTD#70
MSM94_0_Underway-4	2020/09/02 17:00:00	TSG EM122 ADCP	59°23.364' N	014°37.652' W	869.0	Stop recording