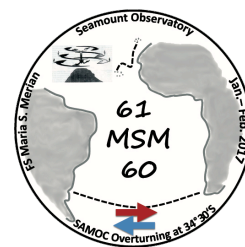
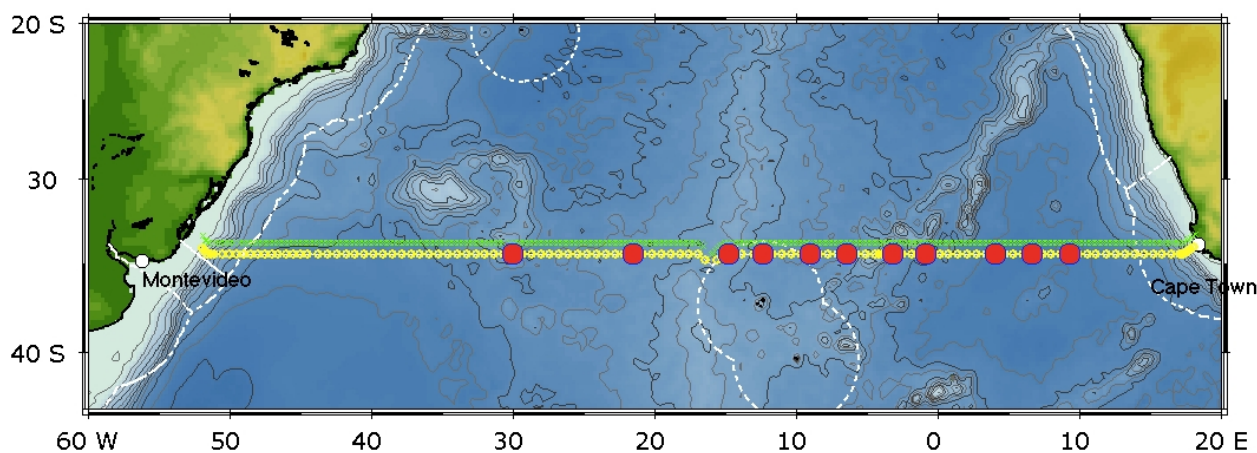


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Short Cruise Report RV Maria S Merian MSM60

Cape Town, South Africa – Montevideo, Uruguay
04. January – 01. February 2017
Chief scientist: Johannes Karstensen
Captain: Ralf Schmidt



RV Maria S. Merian MSM60 cruise track from Cape Town to Montevideo. Yellow dots indicate CTD/IADCP/UVP casts, red circles indicate Argo float deployments, XBT data (green cross) are shown with an latitude offset.

Objectives

The Maria S Merian MSM60 expedition was the first basin-wide section across the South Atlantic following the SAMBA/SAMOC line at 34°30'S. The scientific program consisted of full water depth sampling (up to 5300m) using the CTD/O2/IADCP rosette system. The water samples have been analysed on board for oxygen, dissolved inorganic carbon, alkalinity, salinity, CFC12, and SF6. In addition samples have been taken for later analysis of nutrients, chlorophyll structure (HPLC), POC, and nitrogen isotope analysis. The sampling and measurements were performed against highest standards defined in the GO-SHIP cruise recommendations (<http://www.go-ship.org/>). An Underwater Vision Profiler (UVP) was mounted on the CTD for full depth particle photography. Underway measurements included hull mounted ADCPs (75kHz and 38kHz) and high resolution (11nm) XBT probes. The data will be analysed for multiple purposes including calculation of the meridional volume, heat, and freshwater transport across the SAMBA/SAMOC line. The biogeochemical data will be compared to historical data acquired at neighbouring sections, e.g. along the WOCE/GO-SHIP A10 section (30°S) occupied by RV Meteor in 1993 as part of the WOCE program. The MSM60 expedition is a contribution to the EU H-2020 AtlantOS project.

Narrative

Preparatory work for Maria S Merian started in Cape Town, South Africa, on January 2nd, early morning. In the late afternoon of January 3rd all science crew member (22), incl. one Navy observer from Brazil, were on board the ship. Departure was planned January 4th, 08:00, but was delayed because of bunkering was delayed and a dog-squad search of the ship for blind passengers. Finally we left harbour for the expedition MSM60 on January 4th, 2017 at 14:50 (Local Time).

We headed southwest for a first XBT launch at the 100 m isobaths and a first CTD test station at the 150 m isobath. Unfortunately the CTD at the first test station failed because of a hose that was not removed. We worked our way westward and down the continental slope with XBTs' launched every 10 nm (later stretched to 11 nm). The CTD sampling was at the boundary about 20 nm, to resolve the more complex current structure we expected here, and later stretched to 33 nm. The first CTD profiles were done with a PAR sensor mounted, but the sensor was removed after the water depth exceeded 2400 m (January 5th). During the first days the CTD cable termination had to be renewed a few times (after CTD st # 13 and #15) because of an unfortunate combination of wind, currents and waves all coming from different directions the tension cycling was too extreme.

On January 07th we used changed the winch to see if maybe the wire itself was the problem – but that didn't help much. However, the CTD/IADCP/UVP package could be operated at almost all casts and returned good data. On January 7th we started with sending the XBT and CTD cast data on a daily basis to Coriolis data centre (France) and to NOAA (USA). We have been approached by a UK group from NOC-Southampton (Brian King) and by EuroArgo to launch a couple of floats along our track. The first of these floats was launched on the January 8th in the Cape Basin. A few minor problems occurred (ship ADCP communication error, low voltage IADCP) and the seminar talks started on the 9th. On January 10th we had serious problem during CTD #30 – first a shortage at about 600m, followed by a total stop of the system at 3600 m. We tried to restart the application but it failed and we recovered the system and changed the winch (from #2 to #1) again. A shortage in ship winch cable was detected and a new termination of cable prepared. On January 11th the CTD data acquisition stopped at about 5000 m (upcast). Besides a shortcut in the

wire, the data acquisition PC was malfunctioning. Fortunately the WTD team setup a spare PC for us and the system could be used again. We crossed the Greenwich Meridian (January 12th) all systems running, except of a few problems with the CTD release pylon that controls the bottle sampling. Again the WTD/electronics help us by trying to exchange our with the Maria S Merian own pylon – however, that did not work at all and we changed back to the old (malfunctioned) system.

We crossed the Walvis Ridge (14th), which separates the Cape Basin from the Angola Basin, and water depth changed drastically by more than 3000 m over a distance of 15 km only. On January 17th we headed to more than half a degree south in order to recover a BioArgo float owned by French colleagues from Villefranche. The float was drifting since October 2016 (shortly after deployment) for unknown reasons. Because it was to rough seas or a Zodica recovery, the crew designed a recovery tool that proved to work well and the float was on board at 18:40 LT. We then headed back to the nominal latitude 34.5°S of our SAMBA/SAMOC section. A short report was written about the recovery (incl. the tool) and send to JCOMM. Because Argo drifter are nowadays more frequently equipped with additional (expensive) sensors it is getting increasingly attractive to recover floats to re-use and recalibrate the sensors.

A topographic survey of the Ridge system close to the Rio Grande Rise was performed on January 22nd. The Ridge is an important obstacle for the flow of Antarctic Bottom Water. Towards the end of the MSM60 expedition we started with preparations not only for the leaving the ship but for the reception that was kindly arranged by the captain and the German embassy in Montevideo on February 1st. All groups on board prepared a poster presentation. On January 30th we entered into Brazilian EEZ and the EM122 was stopped because we did not apply for permission to use the device in Brazilian waters. On January 31st the last CTD station (#128) was done at 130 m water depth and a last XBT (#331) at 100 m. We stopped underway data acquisition when entering the Uruguayan EEZ. The reception took place a couple of hours after we moored in Montevideo old town harbour.

Acknowledgement

We thank Captain Ralf Schmidt, his officers and the crew of RV Maria S. Merian for their support of our observational program and the hospitality on board. The ship time was provided by the Deutsche Forschungsgemeinschaft within the METEOR/MERIAN core program. Financial support for the different work carried out during the expedition was provided by the H2020 Project AtlantOS. We also benefited from financial contributions by the research institutions involved.

Cruise participants science:

Name	Institute	Responsibility
Johannes Karstensen	GEOMAR	Chiefscientist
Rebecca Hummels	GEOMAR	CTD (processing responsible)
Tim Stöven	GEOMAR	CFC/SF6 data Quality Control
Julia Schrandt	CAU Kiel	CFC/SF6 helper
Caroline Edsgren	GEOMAR	CFC/SF6 helper
Andreas Rogge	AWI	UVP (processing responsible), helper CFC
Sabrina Speich	ENS	CTD helper; Salinometer (processing responsible), supervision training
Sarah Asdar	UCT	CTD Helper & station list responsible
Maria Paz Chidichimo	SHN	CTD; Argo floats responsible
Raul Guerrero	INIDEP	CTD/ADCP/IADCP (incl. quality control)
Louise Branlard	UCT	CTD helper & Responsible Real-time data submission
Marion Kersale	UCT	CTD helper; ADCP (processing responsible)
Ngwako Mohale	UCT	CTD helper; TSG/Underway (processing responsible)
Tanya Marshall	UCT	CTD helper; XBT (processing responsible)
Leticia Cotrim da Cunha	UERJ	Carbon Helper; POC responsible
Olga Tiemi Sato	USP	CTD helper; Salinometer
Glauca B. Benedetti Berbel	IFSP	Nutrient/oxygen sampling; Oxygen processing resp.
Bruno Sutti Otera	IFSP	Nutrient and oxygen sampling
Andréa Carvalho	FURG	Carbon helper, Phytoplankton (HPLC) responsible
Steve Jones	U Exeter	Carbon (processing responsible)
Alice Lebehot	U Exeter	Carbon data Quality Control
Aline da Silva Calixto	Navy	Observer

GEOMAR: Helmholtz-Zentrum für Ozeanforschung Kiel, Kiel, Germany

CAU Kiel: Christian Albers Universität, Kiel, Germany

ENS: École normale supérieure; 45, rue d'Ulm, Paris /France

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IFSP: Instituto Federal de Ciência e Tecnologia de São Paulo, São Paulo, Brasil

UERJ: Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brasil

INIDEP: National Institute for Fishery Research & Development, Mar del Plata, Argentina

SHN: Servicio de Hidrografía Naval, Buenos Aires, Argentina

UCT: University of Cape Town, University Avenue, Rondebosch, South Africa

AWI: Alfred-Wegener-Institut, Am Handelshafen 12, Bremerhaven, Germany

U Exeter: University of Exeter, College of Life and Environmental Sciences, Exeter, Devon, Great Britain



Science crew participants Maria S Merian MSM6 expedition

Station list Maria S Merian MSM60

Gear coding

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

XBT: Expandabel Bathythermograph

ARGO: Float operation (deployment/recovery)

Ship Station #	Gear St. #	Date	Time (UTC)	Latitude	Longitude	Depth [m]	Gear code
MSM60/001-1	1 XBT	04.01.2017	14:38	34°0.34' S	18°11.81' E	94.7	XBT
MSM60/002-1	1 CTD	04.01.2017	15:34	34°2.30' S	18°8.75' E	159.7	CTD/RO
MSM60/003-1	2 XBT	04.01.2017	16:24	34°6.47' S	18°2.06' E	221.5	XBT
MSM60/004-1	3 XBT	04.01.2017	17:17	34°12.71' S	17°52.09' E	298.5	XBT
MSM60/005-1	2 CTD	04.01.2017	17:48	34°13.04' S	17°51.31' E	306.6	CTD/RO
MSM60/006-1	4 XBT	04.01.2017	19:00	34°18.48' S	17°42.86' E	433.3	XBT
MSM60/007-1	3 CTD	04.01.2017	19:52	34°20.69' S	17°39.52' E	651.8	CTD/RO
MSM60/008-1	4 CTD	04.01.2017	21:33	34°21.56' S	17°37.77' E	822.7	CTD/RO
MSM60/009-1	5 CTD	04.01.2017	23:50	34°22.64' S	17°36.00' E	nan	CTD/RO
MSM60/010-1	5 XBT	05.01.2017	00:25	34°23.45' S	17°34.91' E	nan	XBT
MSM60/011-1	6 CTD	05.01.2017	01:57	34°24.34' S	17°33.42' E	nan	CTD/RO
MSM60/012-1	7 CTD	05.01.2017	04:51	34°26.19' S	17°28.18' E	1605.4	CTD/RO
MSM60/013-1	8 CTD	05.01.2017	07:19	34°28.22' S	17°22.90' E	1864	CTD/RO
MSM60/014-1	6 XBT	05.01.2017	08:18	34°29.01' S	17°20.84' E	2010.6	XBT
MSM60/015-1	9 CTD	05.01.2017	10:05	34°29.81' S	17°18.05' E	2130.1	CTD/RO
MSM60/016-1	10 CTD	05.01.2017	12:47	34°29.89' S	17°13.21' E	2440.2	CTD/RO
MSM60/017-1	7 XBT	05.01.2017	13:53	34°29.96' S	17°9.66' E	2629.5	XBT
MSM60/018-1	11 CTD	05.01.2017	15:16	34°29.98' S	17°8.30' E	2864.2	CTD/RO
MSM60/019-1	8 XBT	05.01.2017	17:20	34°30.01' S	16°58.49' E	3270.4	XBT
MSM60/020-1	9 XBT	05.01.2017	18:17	34°29.99' S	16°45.75' E	3250.9	XBT
MSM60/021-1	10 XBT	05.01.2017	18:35	34°29.99' S	16°41.90' E	3357.7	XBT
MSM60/022-1	11 XBT	05.01.2017	19:10	34°29.99' S	16°34.47' E	3550	XBT
MSM60/023-1	12 CTD	05.01.2017	20:44	34°29.95' S	16°30.94' E	3663.7	CTD/RO
MSM60/024-1	12 XBT	05.01.2017	22:41	34°29.99' S	16°21.53' E	3916.1	XBT
MSM60/025-1	13 XBT	05.01.2017	23:36	34°29.98' S	16°9.26' E	4056.7	XBT
MSM60/026-1	14 XBT	06.01.2017	00:27	34°30.00' S	15°57.69' E	4161.1	XBT
MSM60/027-1	13 CTD	06.01.2017	02:22	34°29.96' S	15°53.38' E	4200.4	CTD/RO
MSM60/028-1	15 XBT	06.01.2017	04:20	34°29.99' S	15°46.02' E	4265.4	XBT
MSM60/029-1	16 XBT	06.01.2017	05:14	34°29.99' S	15°33.81' E	4369.1	XBT
MSM60/030-1	17 XBT	06.01.2017	06:10	34°29.99' S	15°21.48' E	4443.1	XBT
MSM60/031-1	14 CTD	06.01.2017	08:08	34°29.96' S	15°15.93' E	4462.5	CTD/RO
MSM60/032-1	18 XBT	06.01.2017	10:21	34°29.99' S	15°6.10' E	4485.9	XBT
MSM60/033-1	19 XBT	06.01.2017	11:19	34°29.99' S	14°52.94' E	4495.9	XBT
MSM60/034-1	20 XBT	06.01.2017	12:14	34°29.99' S	14°40.24' E	4528.5	XBT
MSM60/035-1	15 CTD	06.01.2017	14:08	34°30.11' S	14°38.32' E	4151.6	CTD/RO
MSM60/036-1	21 XBT	06.01.2017	16:28	34°29.99' S	14°27.26' E	4558.1	XBT
MSM60/037-1	22 XBT	06.01.2017	17:28	34°30.00' S	14°13.37' E	4566.5	XBT
MSM60/038-1	23 XBT	06.01.2017	18:20	34°29.99' S	14°1.13' E	4575.8	XBT
MSM60/039-1	16 CTD	06.01.2017	20:26	34°30.09' S	13°55.43' E	4576.9	CTD/RO

MSM60/040-1	24 XBT	06.01.2017	22:31	34°29.99' S	13°46.91' E	4581.2	XBT
MSM60/041-1	25 XBT	06.01.2017	23:20	34°29.99' S	13°35.08' E	4619.3	XBT
MSM60/042-1	26 XBT	07.01.2017	00:12	34°29.99' S	13°22.15' E	4646	XBT
MSM60/043-1	17 CTD	07.01.2017	02:08	34°29.73' S	13°16.14' E	3490.6	CTD/RO
MSM60/044-1	27 XBT	07.01.2017	04:23	34°29.98' S	13°7.09' E	4663.5	XBT
MSM60/045-1	28 XBT	07.01.2017	05:12	34°29.99' S	12°55.24' E	4696.5	XBT
MSM60/046-1	29 XBT	07.01.2017	05:17	34°29.99' S	12°54.02' E	4706.7	XBT
MSM60/047-1	30 XBT	07.01.2017	06:03	34°29.99' S	12°42.71' E	4739	XBT
MSM60/048-1	18 CTD	07.01.2017	08:09	34°29.49' S	12°36.66' E	3857.6	CTD/RO
MSM60/049-1	31 XBT	07.01.2017	10:14	34°29.99' S	12°29.15' E	4775.4	XBT
MSM60/050-1	32 XBT	07.01.2017	11:06	34°29.99' S	12°16.30' E	4801.9	XBT
MSM60/051-1	33 XBT	07.01.2017	12:03	34°29.99' S	12°2.11' E	4835.9	XBT
MSM60/052-1	19 CTD	07.01.2017	14:06	34°29.92' S	11°57.57' E	4556.2	CTD/RO
MSM60/053-1	34 XBT	07.01.2017	16:10	34°29.99' S	11°49.22' E	4874.7	XBT
MSM60/054-1	35 XBT	07.01.2017	16:55	34°29.99' S	11°37.52' E	4896	XBT
MSM60/055-1	36 XBT	07.01.2017	17:53	34°29.99' S	11°22.54' E	4939.4	XBT
MSM60/056-1	20 CTD	07.01.2017	20:13	34°30.22' S	11°11.95' E	4990.7	CTD/RO
MSM60/057-1	37 XBT	07.01.2017	21:51	34°30.01' S	11°11.03' E	4985.2	XBT
MSM60/058-1	38 XBT	07.01.2017	22:45	34°29.99' S	10°57.96' E	4978.7	XBT
MSM60/059-1	39 XBT	07.01.2017	23:39	34°29.99' S	10°45.00' E	5013.6	XBT
MSM60/060-1	21 CTD	08.01.2017	01:44	34°29.92' S	10°39.00' E	5018.1	CTD/RO
MSM60/061-1	40 XBT	08.01.2017	03:55	34°29.99' S	10°31.51' E	5017.9	XBT
MSM60/062-1	41 XBT	08.01.2017	04:56	34°29.99' S	10°16.30' E	5025.4	XBT
MSM60/063-1	42 XBT	08.01.2017	05:45	34°29.99' S	10°4.10' E	5031.4	XBT
MSM60/064-1	22 CTD	08.01.2017	07:44	34°29.97' S	9°59.76' E	5032.8	CTD/RO
MSM60/065-1	43 XBT	08.01.2017	09:56	34°29.99' S	9°52.50' E	5066.8	XBT
MSM60/066-1	44 XBT	08.01.2017	10:52	34°29.99' S	9°38.98' E	5075.6	XBT
MSM60/067-1	45 XBT	08.01.2017	11:47	34°29.99' S	9°25.86' E	5060	XBT
MSM60/068-1	23 CTD	08.01.2017	13:53	34°29.98' S	9°20.48' E	5048	CTD/RO
MSM60/068-2	1 ARGO	08.01.2017	15:44	34°30.10' S	9°20.15' E	5049.6	ARGOFL
MSM60/069-1	46 XBT	08.01.2017	16:18	34°29.99' S	9°12.95' E	5054.5	XBT
MSM60/070-1	47 XBT	08.01.2017	17:12	34°29.99' S	9°0.10' E	5035.1	XBT
MSM60/071-1	48 XBT	08.01.2017	18:07	34°29.99' S	8°46.98' E	5089	XBT
MSM60/072-1	24 CTD	08.01.2017	20:07	34°29.98' S	8°41.19' E	5103.6	CTD/RO
MSM60/073-1	49 XBT	08.01.2017	22:12	34°29.99' S	8°33.61' E	5115.9	XBT
MSM60/074-1	50 XBT	08.01.2017	23:06	34°29.99' S	8°20.36' E	5151.5	XBT
MSM60/075-1	51 XBT	08.01.2017	23:55	34°29.99' S	8°7.98' E	5165	XBT
MSM60/076-1	25 CTD	09.01.2017	02:03	34°29.91' S	8°1.78' E	5179.9	CTD/RO
MSM60/077-1	52 XBT	09.01.2017	04:10	34°29.99' S	7°54.41' E	5189.6	XBT
MSM60/078-1	53 XBT	09.01.2017	04:11	34°29.99' S	7°54.17' E	5193.4	XBT
MSM60/079-1	54 XBT	09.01.2017	05:57	34°30.09' S	7°28.09' E	5224	XBT
MSM60/080-1	26 CTD	09.01.2017	07:41	34°30.48' S	7°26.90' E	5219.5	CTD/RO
MSM60/081-1	55 XBT	09.01.2017	10:12	34°30.00' S	7°15.28' E	5171.8	XBT
MSM60/082-1	56 XBT	09.01.2017	11:08	34°29.99' S	7°2.13' E	5278.2	XBT
MSM60/083-1	57 XBT	09.01.2017	12:04	34°29.99' S	6°48.87' E	5312	XBT
MSM60/084-1	27 CTD	09.01.2017	14:14	34°29.95' S	6°43.28' E	5177.2	CTD/RO

MSM60/084-2	2 ARGO	09.01.2017	16:06	34°29.95' S	6°43.27' E	5354.3	ARGOFL
MSM60/085-1	58 XBT	09.01.2017	16:41	34°29.99' S	6°35.72' E	5327.6	XBT
MSM60/086-1	59 XBT	09.01.2017	17:35	34°29.99' S	6°22.83' E	5317.9	XBT
MSM60/087-1	60 XBT	09.01.2017	18:31	34°29.99' S	6°9.37' E	5310.4	XBT
MSM60/088-1	28 CTD	09.01.2017	20:31	34°29.98' S	6°3.99' E	5271.8	CTD/RO
MSM60/089-1	61 XBT	09.01.2017	22:43	34°29.99' S	5°56.53' E	5298.2	XBT
MSM60/090-1	62 XBT	09.01.2017	23:38	34°29.99' S	5°43.64' E	5215.1	XBT
MSM60/091-1	63 XBT	10.01.2017	00:35	34°29.99' S	5°30.71' E	5253.1	XBT
MSM60/092-1	29 CTD	10.01.2017	02:41	34°29.98' S	5°24.77' E	5219.9	CTD/RO
MSM60/093-1	64 XBT	10.01.2017	04:50	34°29.99' S	5°17.09' E	5270.4	XBT
MSM60/094-1	65 XBT	10.01.2017	05:48	34°29.99' S	5°3.72' E	5212	XBT
MSM60/095-1	66 XBT	10.01.2017	06:42	34°29.99' S	4°51.09' E	5186.5	XBT
MSM60/096-1	30 CTD	10.01.2017	08:31	34°29.98' S	4°45.43' E	5250.1	CTD/RO
MSM60/096-2	31 CTD	10.01.2017	12:29	34°29.97' S	4°45.41' E	5259	CTD/RO
MSM60/097-1	67 XBT	10.01.2017	14:36	34°29.99' S	4°38.56' E	5218.1	XBT
MSM60/098-1	68 XBT	10.01.2017	15:33	34°29.99' S	4°24.54' E	5178.6	XBT
MSM60/099-1	69 XBT	10.01.2017	16:24	34°29.99' S	4°11.97' E	5255.3	XBT
MSM60/100-1	32 CTD	10.01.2017	18:37	34°29.99' S	4°6.12' E	5344	CTD/RO
MSM60/100-2	3 ARGO	10.01.2017	20:37	34°30.02' S	4°6.09' E	5351.2	ARGOFL
MSM60/101-1	70 XBT	10.01.2017	21:12	34°29.99' S	3°58.81' E	5250.3	XBT
MSM60/102-1	71 XBT	10.01.2017	22:08	34°29.99' S	3°45.69' E	5073.1	XBT
MSM60/103-1	72 XBT	10.01.2017	23:05	34°29.99' S	3°32.46' E	5027.9	XBT
MSM60/104-1	33 CTD	11.01.2017	01:03	34°29.93' S	3°26.79' E	5002.4	CTD/RO
MSM60/105-1	73 XBT	11.01.2017	02:45	34°29.99' S	3°19.49' E	4965	XBT
MSM60/106-1	74 XBT	11.01.2017	03:41	34°29.99' S	3°6.33' E	4986.8	XBT
MSM60/107-1	75 XBT	11.01.2017	04:38	34°29.99' S	2°52.83' E	4938.2	XBT
MSM60/108-1	34 CTD	11.01.2017	06:58	34°29.98' S	2°47.54' E	4930	CTD/RO
MSM60/109-1	76 XBT	11.01.2017	09:05	34°29.99' S	2°40.03' E	4883.8	XBT
MSM60/110-1	77 XBT	11.01.2017	10:00	34°29.99' S	2°26.76' E	4887.1	XBT
MSM60/111-1	78 XBT	11.01.2017	10:52	34°29.99' S	2°13.92' E	4897.5	XBT
MSM60/112-1	35 CTD	11.01.2017	12:54	34°30.00' S	2°8.25' E	4931.9	CTD
MSM60/113-1	79 XBT	11.01.2017	14:58	34°29.99' S	2°1.36' E	4879	XBT
MSM60/114-1	80 XBT	11.01.2017	15:59	34°30.00' S	1°47.58' E	4920.2	XBT
MSM60/115-1	81 XBT	11.01.2017	16:57	34°30.00' S	1°34.59' E	4853	XBT
MSM60/116-1	36 CTD	11.01.2017	18:59	34°29.99' S	1°28.97' E	4873.1	CTD/RO
MSM60/117-1	82 XBT	11.01.2017	20:59	34°29.99' S	1°21.95' E	4909.1	XBT
MSM60/118-1	83 XBT	11.01.2017	21:58	34°30.00' S	1°8.31' E	4927.4	XBT
MSM60/119-1	84 XBT	11.01.2017	22:57	34°29.99' S	0°55.04' E	4787.7	XBT
MSM60/120-1	37 CTD	12.01.2017	00:49	34°29.99' S	0°49.69' E	4480.7	CTD/RO
MSM60/120-2	4 ARGO	12.01.2017	02:16	34°29.99' S	0°49.68' E	4421.5	ARGOFL
MSM60/121-1	85 XBT	12.01.2017	02:47	34°29.99' S	0°42.54' E	3076.6	XBT
MSM60/122-1	86 XBT	12.01.2017	03:41	34°29.99' S	0°28.97' E	3194.9	XBT
MSM60/123-1	87 XBT	12.01.2017	04:32	34°29.99' S	0°15.94' E	3922.1	XBT
MSM60/124-1	38 CTD	12.01.2017	06:22	34°29.98' S	0°10.34' E	4614.2	CTD/RO
MSM60/125-1	88 XBT	12.01.2017	08:34	34°30.00' S	0°0.06' E	4617.1	XBT
MSM60/126-1	89 XBT	12.01.2017	09:19	34°29.99' S	0°10.46' W	4609	XBT

MSM60/127-1	90 XBT	12.01.2017	10:15	34°29.99' S	0°23.36' W	4587.1	XBT
MSM60/128-1	39 CTD	12.01.2017	12:07	34°30.00' S	0°28.95' W	4545.8	CTD/RO
MSM60/129-1	91 XBT	12.01.2017	14:04	34°30.00' S	0°36.53' W	4517.2	XBT
MSM60/130-1	92 XBT	12.01.2017	14:55	34°30.00' S	0°48.89' W	3663.7	XBT
MSM60/131-1	93 XBT	12.01.2017	15:53	34°29.99' S	1°2.70' W	3029.1	XBT
MSM60/132-1	40 CTD	12.01.2017	17:24	34°29.98' S	1°8.23' W	3442.9	CTD/RO
MSM60/133-1	94 XBT	12.01.2017	19:07	34°29.99' S	1°15.65' W	4442.3	XBT
MSM60/134-1	95 XBT	12.01.2017	20:03	34°30.00' S	1°28.85' W	4301.4	XBT
MSM60/135-1	96 XBT	12.01.2017	20:58	34°29.98' S	1°42.11' W	4478.9	XBT
MSM60/136-1	41 CTD	12.01.2017	22:53	34°29.98' S	1°47.54' W	4495.3	CTD/RO
MSM60/137-1	97 XBT	13.01.2017	00:45	34°29.99' S	1°54.80' W	4488.1	XBT
MSM60/138-1	98 XBT	13.01.2017	01:38	34°29.99' S	2°8.11' W	4278.3	XBT
MSM60/139-1	99 XBT	13.01.2017	02:29	34°29.99' S	2°20.84' W	4060.1	XBT
MSM60/140-1	42 CTD	13.01.2017	04:16	34°29.98' S	2°26.80' W	4111.7	CTD/RO
MSM60/141-1	100 XBT	13.01.2017	06:06	34°29.99' S	2°34.40' W	4106.5	XBT
MSM60/142-1	101 XBT	13.01.2017	07:03	34°29.99' S	2°48.06' W	4135	XBT
MSM60/143-1	102 XBT	13.01.2017	07:57	34°29.99' S	3°0.75' W	4176.6	XBT
MSM60/144-1	43 CTD	13.01.2017	09:44	34°29.98' S	3°6.11' W	4162.9	CTD/RO
MSM60/144-2	5 ARGO	13.01.2017	11:03	34°30.00' S	3°6.12' W	4164.2	ARGOFL
MSM60/145-1	103 XBT	13.01.2017	11:45	34°29.99' S	3°14.31' W	4074.1	XBT
MSM60/146-1	104 XBT	13.01.2017	12:39	34°29.99' S	3°26.89' W	2578	XBT
MSM60/147-1	105 XBT	13.01.2017	13:30	34°29.99' S	3°39.11' W	1206.3	XBT
MSM60/148-1	44 CTD	13.01.2017	14:46	34°29.99' S	3°51.00' W	941	CTD/RO
MSM60/149-1	106 XBT	13.01.2017	15:17	34°29.98' S	3°53.19' W	911	XBT
MSM60/150-1	45 CTD	13.01.2017	17:17	34°29.94' S	4°6.23' W	2204.6	CTD/RO
MSM60/151-1	107 XBT	13.01.2017	18:11	34°29.98' S	4°7.08' W	2511.1	XBT
MSM60/152-1	108 XBT	13.01.2017	18:58	34°30.00' S	4°18.99' W	3610	XBT
MSM60/153-1	46 CTD	13.01.2017	20:09	34°29.98' S	4°24.71' W	3661.9	CTD/RO
MSM60/153-2	47 CTD	13.01.2017	22:30	34°29.98' S	4°24.71' W	3660.3	CTD/RO
MSM60/154-1	109 XBT	14.01.2017	00:32	34°29.99' S	4°31.73' W	3659.6	XBT
MSM60/155-1	110 XBT	14.01.2017	01:25	34°29.98' S	4°44.80' W	2848.5	XBT
MSM60/156-1	111 XBT	14.01.2017	02:20	34°29.98' S	4°58.36' W	2104.1	XBT
MSM60/157-1	48 CTD	14.01.2017	03:19	34°30.01' S	5°4.03' W	2160	CTD/RO
MSM60/158-1	112 XBT	14.01.2017	04:26	34°29.99' S	5°11.56' W	2402	XBT
MSM60/159-1	113 XBT	14.01.2017	05:21	34°29.99' S	5°25.03' W	3934.1	XBT
MSM60/160-1	114 XBT	14.01.2017	06:14	34°29.98' S	5°37.75' W	3992	XBT
MSM60/161-1	49 CTD	14.01.2017	07:58	34°29.98' S	5°43.28' W	4017.7	CTD/RO
MSM60/162-1	115 XBT	14.01.2017	09:46	34°30.00' S	5°50.81' W	4030.9	XBT
MSM60/163-1	116 XBT	14.01.2017	10:37	34°29.99' S	6°3.49' W	4140.9	XBT
MSM60/164-1	117 XBT	14.01.2017	11:30	34°29.99' S	6°16.79' W	4238.5	XBT
MSM60/165-1	50 CTD	14.01.2017	13:19	34°29.98' S	6°22.60' W	4125.7	CTD/RO
MSM60/165-2	6 ARGO	14.01.2017	14:47	34°30.04' S	6°22.64' W	4128.9	ARGOFL
MSM60/166-1	118 XBT	14.01.2017	15:19	34°29.99' S	6°29.68' W	4208.7	XBT
MSM60/167-1	119 XBT	14.01.2017	16:15	34°29.99' S	6°43.86' W	4104.2	XBT
MSM60/168-1	120 XBT	14.01.2017	17:07	34°29.99' S	6°56.54' W	4224.6	XBT
MSM60/169-1	121 XBT	14.01.2017	17:13	34°29.99' S	6°58.02' W	4234.8	XBT

MSM60/170-1	51 CTD	14.01.2017	18:51	34°29.99' S	7°1.88' W	4271.9	CTD/RO
MSM60/171-1	122 XBT	14.01.2017	20:43	34°29.99' S	7°8.97' W	4261.1	XBT
MSM60/172-1	123 XBT	14.01.2017	21:36	34°30.01' S	7°22.33' W	4247.7	XBT
MSM60/173-1	124 XBT	14.01.2017	22:29	34°29.98' S	7°35.47' W	4227	XBT
MSM60/174-1	52 CTD	15.01.2017	00:15	34°29.97' S	7°41.18' W	4332	CTD/RO
MSM60/175-1	125 XBT	15.01.2017	02:05	34°29.99' S	7°48.49' W	3912.3	XBT
MSM60/176-1	126 XBT	15.01.2017	02:56	34°30.00' S	8°1.93' W	4057.3	XBT
MSM60/177-1	127 XBT	15.01.2017	03:45	34°29.99' S	8°14.80' W	4072.7	XBT
MSM60/178-1	53 CTD	15.01.2017	05:28	34°29.99' S	8°20.47' W	4057.2	CTD/RO
MSM60/179-1	128 XBT	15.01.2017	07:13	34°29.99' S	8°27.83' W	4251	XBT
MSM60/180-1	129 XBT	15.01.2017	08:05	34°29.99' S	8°40.99' W	3949.7	XBT
MSM60/181-1	130 XBT	15.01.2017	08:55	34°29.99' S	8°53.84' W	3999.4	XBT
MSM60/182-1	54 CTD	15.01.2017	10:42	34°29.99' S	8°59.77' W	4025	CTD/RO
MSM60/182-2	7 ARGO	15.01.2017	12:00	34°30.00' S	8°59.77' W	4027.8	ARGOFL
MSM60/183-1	131 XBT	15.01.2017	12:38	34°29.99' S	9°8.037' W	4162.2	XBT
MSM60/183-2	132 XBT	15.01.2017	13:08	34°29.99' S	9°15.18' W	4162.2	XBT
MSM60/184-1	133 XBT	15.01.2017	13:29	34°29.99' S	9°20.35' W	4182.2	XBT
MSM60/185-1	134 XBT	15.01.2017	14:21	34°29.99' S	9°33.04' W	4448.4	XBT
MSM60/186-1	55 CTD	15.01.2017	16:20	34°29.99' S	9°39.06' W	4483.4	CTD/RO
MSM60/187-1	135 XBT	15.01.2017	18:08	34°29.99' S	9°45.99' W	4407.7	XBT
MSM60/188-1	136 XBT	15.01.2017	19:00	34°29.99' S	9°59.65' W	4343.2	XBT
MSM60/189-1	137 XBT	15.01.2017	19:47	34°29.99' S	10°12.07' W	4073.1	XBT
MSM60/190-1	56 CTD	15.01.2017	21:31	34°30.00' S	10°18.35' W	4138.5	CTD/RO
MSM60/191-1	138 XBT	15.01.2017	23:19	34°29.99' S	10°25.70' W	3712.2	XBT
MSM60/192-1	139 XBT	16.01.2017	00:12	34°29.99' S	10°38.95' W	3772.1	XBT
MSM60/193-1	140 XBT	16.01.2017	01:04	34°29.98' S	10°52.18' W	3851.5	XBT
MSM60/194-1	57 CTD	16.01.2017	02:46	34°29.98' S	10°57.64' W	3925.2	CTD/RO
MSM60/195-1	141 XBT	16.01.2017	04:30	34°29.99' S	11°4.96' W	4405.8	XBT
MSM60/196-1	142 XBT	16.01.2017	05:21	34°29.98' S	11°18.25' W	4286.6	XBT
MSM60/197-1	143 XBT	16.01.2017	06:12	34°29.99' S	11°31.59' W	3996.3	XBT
MSM60/198-1	58 CTD	16.01.2017	07:54	34°29.98' S	11°36.95' W	4005.6	CTD/RO
MSM60/199-1	144 XBT	16.01.2017	09:43	34°29.99' S	11°44.18' W	3653.9	XBT
MSM60/200-1	145 XBT	16.01.2017	10:35	34°29.99' S	11°57.53' W	3947.3	XBT
MSM60/201-1	146 XBT	16.01.2017	11:25	34°29.99' S	12°10.20' W	3953.9	XBT
MSM60/202-1	59 CTD	16.01.2017	13:11	34°30.00' S	12°16.22' W	3914.7	CTD/RO
MSM60/202-2	8 ARGO	16.01.2017	14:30	34°30.00' S	12°16.22' W	3922.4	ARGOFL
MSM60/203-1	147 XBT	16.01.2017	15:03	34°29.99' S	12°23.31' W	3814.6	XBT
MSM60/204-1	148 XBT	16.01.2017	15:55	34°29.99' S	12°36.33' W	3816.5	XBT
MSM60/205-1	149 XBT	16.01.2017	16:49	34°29.99' S	12°49.94' W	3669.9	XBT
MSM60/206-1	60 CTD	16.01.2017	18:22	34°30.00' S	12°55.52' W	3716	CTD/RO
MSM60/207-1	150 XBT	16.01.2017	20:09	34°30.00' S	13°4.10' W	3570.3	XBT
MSM60/208-1	151 XBT	16.01.2017	20:57	34°29.99' S	13°8.82' W	3480.4	XBT
MSM60/209-1	152 XBT	16.01.2017	21:52	34°29.99' S	13°29.15' W	3372.5	XBT
MSM60/210-1	153 XBT	16.01.2017	22:44	34°29.99' S	13°41.99' W	3331	XBT
MSM60/211-1	61 CTD	17.01.2017	00:29	34°30.00' S	13°49.98' W	3584.7	CTD/RO
MSM60/212-1	154 XBT	17.01.2017	01:59	34°29.98' S	13°55.84' W	3067.5	XBT

MSM60/213-1	155 XBT	17.01.2017	02:50	34°29.98' S	14°8.52' W	3167.1	XBT
MSM60/214-1	62 CTD	17.01.2017	04:21	34°29.98' S	14°14.08' W	3200.2	CTD/RO
MSM60/215-1	156 XBT	17.01.2017	05:52	34°30.01' S	14°21.90' W	2958.3	XBT
MSM60/216-1	157 XBT	17.01.2017	06:53	34°29.99' S	14°37.30' W	3083.9	XBT
MSM60/217-1	158 XBT	17.01.2017	07:35	34°29.99' S	14°47.79' W	2789.6	XBT
MSM60/218-1	159 XBT	17.01.2017	08:27	34°29.98' S	15°0.68' W	3062.9	XBT
MSM60/219-1	63 CTD	17.01.2017	09:52	34°29.97' S	15°5.44' W	3171.6	CTD/RO
MSM60/219-2	9 ARGO	17.01.2017	10:59	34°30.01' S	15°5.42' W	3173.2	ARGOFL
MSM60/220-1	160 XBT	17.01.2017	11:45	34°36.20' S	15°12.05' W	2231.9	XBT
MSM60/221-1	161 XBT	17.01.2017	12:42	34°44.22' S	15°21.91' W	2476.9	XBT
MSM60/222-1	64 CTD	17.01.2017	14:33	34°49.95' S	15°30.08' W	3221.7	CTD/RO
MSM60/223-1	162 XBT	17.01.2017	15:45	34°51.04' S	15°31.47' W	3338.3	XBT
MSM60/224-1	163 XBT	17.01.2017	16:46	34°59.32' S	15°41.49' W	2612.7	XBT
MSM60/225-1	164 XBT	17.01.2017	17:43	35°7.53' S	15°50.27' W	2856.1	XBT
MSM60/226-1	10 ARGO	17.01.2017	18:37	35°11.09' S	15°53.69' W	2467	ARGOFL
MSM60/227-1	165 XBT	17.01.2017	19:00	35°8.83' S	15°57.11' W	3013.2	XBT
MSM60/228-1	65 CTD	17.01.2017	22:25	34°49.97' S	16°21.53' W	3210	CTD/RO
MSM60/229-1	166 XBT	18.01.2017	00:37	34°41.69' S	16°33.74' W	3396.3	XBT
MSM60/230-1	167 XBT	18.01.2017	01:26	34°35.43' S	16°43.13' W	3767.6	XBT
MSM60/231-1	66 CTD	18.01.2017	03:32	34°29.88' S	16°51.34' W	3860.3	CTD/RO
MSM60/232-1	168 XBT	18.01.2017	05:12	34°30.00' S	16°58.35' W	3576.2	XBT
MSM60/233-1	169 XBT	18.01.2017	05:15	34°29.99' S	16°59.12' W	3505.7	XBT
MSM60/234-1	170 XBT	18.01.2017	06:07	34°29.99' S	17°12.30' W	3237.7	XBT
MSM60/235-1	171 XBT	18.01.2017	06:58	34°29.99' S	17°25.13' W	3592	XBT
MSM60/236-1	67 CTD	18.01.2017	08:31	34°29.98' S	17°30.57' W	3607	CTD/RO
MSM60/237-1	172 XBT	18.01.2017	10:12	34°29.99' S	17°37.81' W	3652.8	XBT
MSM60/238-1	173 XBT	18.01.2017	11:05	34°29.99' S	17°50.92' W	3445.7	XBT
MSM60/239-1	174 XBT	18.01.2017	11:58	34°30.00' S	18°4.12' W	3331.7	XBT
MSM60/240-1	68 CTD	18.01.2017	13:33	34°29.99' S	18°9.86' W	3417.1	CTD/RO
MSM60/241-1	175 XBT	18.01.2017	15:08	34°29.99' S	18°17.43' W	3561	XBT
MSM60/242-1	176 XBT	18.01.2017	16:01	34°29.98' S	18°30.64' W	3489.6	XBT
MSM60/243-1	177 XBT	18.01.2017	16:57	34°29.99' S	18°43.81' W	3384.4	XBT
MSM60/244-1	69 CTD	18.01.2017	18:28	34°29.98' S	18°49.16' W	3312.4	CTD/RO
MSM60/245-1	178 XBT	18.01.2017	20:03	34°29.98' S	18°56.54' W	3902	XBT
MSM60/246-1	179 XBT	18.01.2017	20:58	34°29.99' S	19°9.55' W	3766.7	XBT
MSM60/247-1	180 XBT	18.01.2017	21:53	34°29.99' S	19°22.59' W	3691.2	XBT
MSM60/248-1	70 CTD	18.01.2017	23:31	34°29.99' S	19°28.46' W	3420.2	CTD/RO
MSM60/249-1	181 XBT	19.01.2017	01:07	34°29.99' S	19°35.91' W	3684	XBT
MSM60/250-1	182 XBT	19.01.2017	02:01	34°29.99' S	19°48.99' W	3394.5	XBT
MSM60/251-1	183 XBT	19.01.2017	02:53	34°29.99' S	20°2.10' W	3691.4	XBT
MSM60/252-1	71 CTD	19.01.2017	04:28	34°29.99' S	20°7.73' W	3610.6	CTD/RO
MSM60/253-1	184 XBT	19.01.2017	06:08	34°30.00' S	20°15.21' W	3680	XBT
MSM60/254-1	185 XBT	19.01.2017	07:00	34°29.99' S	20°28.06' W	3788.7	XBT
MSM60/255-1	186 XBT	19.01.2017	07:56	34°29.99' S	20°41.76' W	4021.9	XBT
MSM60/256-1	72 CTD	19.01.2017	09:38	34°29.98' S	20°47.04' W	3986.9	CTD/RO
MSM60/257-1	187 XBT	19.01.2017	11:26	34°29.99' S	20°54.40' W	3960.3	XBT

MSM60/258-1	188 XBT	19.01.2017	12:18	34°29.98' S	21°7.58' W	3809.7	XBT
MSM60/259-1	189 XBT	19.01.2017	13:09	34°29.99' S	21°20.38' W	3864.4	XBT
MSM60/260-1	73 CTD	19.01.2017	14:57	34°30.02' S	21°26.33' W	3904.2	CTD/RO
MSM60/260-2	11 ARGO	19.01.2017	16:20	34°30.04' S	21°26.34' W	3924.6	ARGOFL
MSM60/261-1	190 XBT	19.01.2017	16:54	34°29.99' S	21°33.90' W	3914.6	XBT
MSM60/262-1	191 XBT	19.01.2017	17:45	34°29.99' S	21°46.49' W	3950.1	XBT
MSM60/263-1	192 XBT	19.01.2017	18:38	34°29.99' S	21°59.91' W	3953.4	XBT
MSM60/264-1	74 CTD	19.01.2017	20:17	34°29.99' S	22°5.62' W	3956.9	CTD/RO
MSM60/265-1	193 XBT	19.01.2017	22:01	34°29.99' S	22°13.28' W	3911.8	XBT
MSM60/266-1	194 XBT	19.01.2017	22:52	34°29.99' S	22°26.21' W	3997.4	XBT
MSM60/267-1	195 XBT	19.01.2017	22:56	34°29.99' S	22°27.22' W	4005.7	XBT
MSM60/268-1	196 XBT	19.01.2017	23:45	34°29.99' S	22°39.44' W	3757.3	XBT
MSM60/269-1	75 CTD	20.01.2017	01:29	34°30.00' S	22°44.94' W	3945.9	CTD/RO
MSM60/270-1	197 XBT	20.01.2017	03:16	34°29.99' S	22°52.77' W	3900.4	XBT
MSM60/271-1	198 XBT	20.01.2017	04:07	34°29.99' S	23°5.43' W	3869	XBT
MSM60/272-1	199 XBT	20.01.2017	04:59	34°29.99' S	23°18.39' W	3969.4	XBT
MSM60/273-1	76 CTD	20.01.2017	06:42	34°30.00' S	23°24.20' W	3909.4	CTD/RO
MSM60/274-1	200 XBT	20.01.2017	08:22	34°29.99' S	23°31.42' W	4042.8	XBT
MSM60/275-1	201 XBT	20.01.2017	09:13	34°29.99' S	23°44.65' W	3906.1	XBT
MSM60/276-1	202 XBT	20.01.2017	10:05	34°30.00' S	23°57.71' W	3997.8	XBT
MSM60/277-1	77 CTD	20.01.2017	11:50	34°29.97' S	24°3.53' W	4022.9	CTD/RO
MSM60/278-1	203 XBT	20.01.2017	13:33	34°29.99' S	24°11.08' W	4000.7	XBT
MSM60/279-1	204 XBT	20.01.2017	14:23	34°29.99' S	24°24.04' W	3938.8	XBT
MSM60/280-1	205 XBT	20.01.2017	15:12	34°29.99' S	24°36.65' W	3996	XBT
MSM60/281-1	78 CTD	20.01.2017	16:58	34°29.99' S	24°42.84' W	3997.1	CTD/RO
MSM60/282-1	206 XBT	20.01.2017	18:44	34°29.99' S	24°50.42' W	4030.9	XBT
MSM60/283-1	207 XBT	20.01.2017	19:34	34°29.99' S	25°3.03' W	3938.5	XBT
MSM60/284-1	208 XBT	20.01.2017	20:27	34°29.99' S	25°16.35' W	3698.9	XBT
MSM60/285-1	209 XBT	20.01.2017	20:30	34°29.99' S	25°17.11' W	3740	XBT
MSM60/286-1	79 CTD	20.01.2017	22:08	34°29.96' S	25°22.05' W	3853.9	CTD/RO
MSM60/287-1	210 XBT	20.01.2017	23:53	34°29.99' S	25°29.35' W	3972.6	XBT
MSM60/288-1	211 XBT	21.01.2017	00:45	34°29.99' S	25°42.80' W	3940.7	XBT
MSM60/289-1	212 XBT	21.01.2017	01:37	34°29.99' S	25°55.91' W	3849.9	XBT
MSM60/290-1	80 CTD	21.01.2017	03:21	34°29.97' S	26°1.41' W	4018.3	CTD/RO
MSM60/291-1	213 XBT	21.01.2017	05:09	34°29.99' S	26°8.92' W	3771.6	XBT
MSM60/292-1	214 XBT	21.01.2017	05:59	34°29.99' S	26°21.31' W	3709.6	XBT
MSM60/293-1	215 XBT	21.01.2017	06:53	34°29.99' S	26°34.71' W	4009.6	XBT
MSM60/294-1	81 CTD	21.01.2017	08:38	34°29.98' S	26°40.75' W	4074.3	CTD/RO
MSM60/295-1	216 XBT	21.01.2017	10:25	34°29.99' S	26°48.00' W	4324.7	XBT
MSM60/296-1	217 XBT	21.01.2017	11:20	34°29.99' S	27°1.37' W	4180.6	XBT
MSM60/297-1	218 XBT	21.01.2017	12:14	34°29.99' S	27°14.53' W	4309.7	XBT
MSM60/298-1	82 CTD	21.01.2017	14:16	34°29.96' S	27°20.07' W	4092	CTD/RO
MSM60/299-1	219 XBT	21.01.2017	16:17	34°29.99' S	27°27.60' W	4218.6	XBT
MSM60/300-1	220 XBT	21.01.2017	17:12	34°29.99' S	27°40.76' W	4493.3	XBT
MSM60/301-1	221 XBT	21.01.2017	18:04	34°29.99' S	27°53.43' W	4711.1	XBT
MSM60/302-1	83 CTD	21.01.2017	19:57	34°29.97' S	27°59.30' W	4470.4	CTD/RO

MSM60/303-1	222 XBT	21.01.2017	21:51	34°30.00' S	28°6.46' W	4584.6	XBT
MSM60/304-1	223 XBT	21.01.2017	22:42	34°29.99' S	28°19.46' W	4763	XBT
MSM60/305-1	224 XBT	21.01.2017	23:34	34°29.99' S	28°32.63' W	4918.6	XBT
MSM60/306-1	84 CTD	22.01.2017	01:34	34°29.96' S	28°38.62' W	4969.1	CTD/RO
MSM60/307-1	225 XBT	22.01.2017	03:33	34°29.99' S	28°45.93' W	5305	XBT
MSM60/308-1	226 XBT	22.01.2017	04:25	34°29.99' S	28°59.05' W	5385.7	XBT
MSM60/309-1	227 XBT	22.01.2017	05:21	34°29.99' S	29°12.74' W	5366.8	XBT
MSM60/310-1	85 CTD	22.01.2017	07:23	34°29.97' S	29°17.87' W	5373.5	CTD/RO
MSM60/311-1	228 XBT	22.01.2017	09:34	34°29.99' S	29°25.06' W	5277.4	XBT
MSM60/312-1	229 XBT	22.01.2017	10:28	34°29.99' S	29°38.29' W	5262.4	XBT
MSM60/313-1	230 XBT	22.01.2017	11:20	34°29.99' S	29°51.19' W	4452.7	XBT
MSM60/314-1	231 XBT	22.01.2017	11:24	34°29.99' S	29°52.18' W	4436	XBT
MSM60/315-1	86 CTD	22.01.2017	13:09	34°31.48' S	29°57.17' W	4003.4	CTD/RO
MSM60/315-2	12 ARGO	22.01.2017	14:30	34°31.42' S	29°57.08' W	3998.5	ARGOFL
MSM60/316-1	87 CTD	22.01.2017	17:05	34°23.22' S	29°57.19' W	5294.3	CTD/RO
MSM60/318-1	232 XBT	22.01.2017	22:57	34°29.70' S	30°11.82' W	3270.6	XBT
MSM60/319-1	88 CTD	23.01.2017	05:49	34°29.98' S	30°36.46' W	2402.3	CTD/RO
MSM60/320-1	233 XBT	23.01.2017	07:03	34°29.99' S	30°43.63' W	2586.2	XBT
MSM60/321-1	234 XBT	23.01.2017	07:52	34°29.99' S	30°56.75' W	3524.8	XBT
MSM60/322-1	235 XBT	23.01.2017	08:43	34°29.99' S	31°10.01' W	4020	XBT
MSM60/323-1	89 CTD	23.01.2017	10:31	34°29.97' S	31°15.79' W	4121.3	CTD/RO
MSM60/324-1	236 XBT	23.01.2017	12:15	34°29.99' S	31°22.99' W	4237.5	XBT
MSM60/325-1	237 XBT	23.01.2017	13:07	34°29.99' S	31°36.42' W	4355.9	XBT
MSM60/326-1	238 XBT	23.01.2017	13:54	34°30.00' S	31°49.02' W	4401	XBT
MSM60/327-1	90 CTD	23.01.2017	15:47	34°29.99' S	31°55.06' W	4400.3	CTD/RO
MSM60/328-1	239 XBT	23.01.2017	17:38	34°29.99' S	32°1.92' W	4435.5	XBT
MSM60/329-1	240 XBT	23.01.2017	18:31	34°29.98' S	32°15.47' W	4408.5	XBT
MSM60/330-1	241 XBT	23.01.2017	19:21	34°29.99' S	32°28.34' W	4413	XBT
MSM60/331-1	91 CTD	23.01.2017	21:10	34°29.96' S	32°34.37' W	4489.9	CTD/RO
MSM60/332-1	242 XBT	23.01.2017	23:04	34°29.99' S	32°41.65' W	4544.7	XBT
MSM60/333-1	243 XBT	23.01.2017	23:57	34°29.99' S	32°54.82' W	4554.5	XBT
MSM60/333-2	244 XBT	24.01.2017	00:48	34°29.99' S	33°7.84' W	4539.4	XBT
MSM60/334-1	92 CTD	24.01.2017	02:36	34°29.99' S	33°13.66' W	4508.4	CTD/RO
MSM60/334-2	13 ARGO	24.01.2017	04:21	34°30.00' S	33°13.69' W	4498	ARGOFL
MSM60/335-1	245 XBT	24.01.2017	04:54	34°29.99' S	33°22.10' W	4505.1	XBT
MSM60/336-1	246 XBT	24.01.2017	05:39	34°29.99' S	33°33.87' W	4527.9	XBT
MSM60/337-1	247 XBT	24.01.2017	06:29	34°29.99' S	33°47.06' W	3039.8	XBT
MSM60/338-1	93 CTD	24.01.2017	07:48	34°30.00' S	33°52.92' W	2431.5	CTD/RO
MSM60/339-1	248 XBT	24.01.2017	09:07	34°29.99' S	34°0.51' W	3258.4	XBT
MSM60/340-1	249 XBT	24.01.2017	09:57	34°29.99' S	34°13.48' W	4605.8	XBT
MSM60/341-1	250 XBT	24.01.2017	10:47	34°29.99' S	34°26.45' W	4474.8	XBT
MSM60/342-1	94 CTD	24.01.2017	12:38	34°29.99' S	34°32.28' W	4446.1	CTD/RO
MSM60/343-1	251 XBT	24.01.2017	14:28	34°29.99' S	34°39.51' W	4440.2	XBT
MSM60/344-1	252 XBT	24.01.2017	15:15	34°29.99' S	34°52.45' W	4433.6	XBT
MSM60/345-1	253 XBT	24.01.2017	16:05	34°29.99' S	35°6.18' W	4419.4	XBT
MSM60/346-1	95 CTD	24.01.2017	17:51	34°29.98' S	35°11.53' W	4377.5	CTD/RO

MSM60/347-1	254 XBT	24.01.2017	19:48	34°29.99' S	35°18.43' W	4321	XBT
MSM60/348-1	255 XBT	24.01.2017	20:41	34°29.99' S	35°31.78' W	4321	XBT
MSM60/349-1	256 XBT	24.01.2017	21:34	34°29.99' S	35°45.07' W	4531.5	XBT
MSM60/350-1	96 CTD	24.01.2017	23:24	34°30.00' S	35°50.86' W	4581.4	CTD/RO
MSM60/351-1	257 XBT	25.01.2017	01:19	34°29.99' S	35°58.38' W	4651.6	XBT
MSM60/352-1	258 XBT	25.01.2017	02:11	34°30.00' S	36°11.39' W	4738.8	XBT
MSM60/353-1	259 XBT	25.01.2017	03:08	34°29.99' S	36°24.92' W	4627.6	XBT
MSM60/354-1	97 CTD	25.01.2017	05:05	34°30.00' S	36°30.13' W	4546.7	CTD/RO
MSM60/355-1	260 XBT	25.01.2017	07:01	34°29.99' S	36°37.32' W	4711.2	XBT
MSM60/356-1	261 XBT	25.01.2017	07:55	34°29.99' S	36°51.07' W	4659	XBT
MSM60/357-1	262 XBT	25.01.2017	08:45	34°29.99' S	37°4.00' W	4489.2	XBT
MSM60/358-1	98 CTD	25.01.2017	10:37	34°29.99' S	37°9.46' W	4474.3	CTD/RO
MSM60/359-1	263 XBT	25.01.2017	12:30	34°29.99' S	37°16.60' W	4501.4	XBT
MSM60/360-1	264 XBT	25.01.2017	13:23	34°29.99' S	37°30.65' W	4599.8	XBT
MSM60/361-1	265 XBT	25.01.2017	14:12	34° 29.99' S	37° 43.05' W	4627.6	XBT
MSM60/362-1	99 CTD	25.01.2017	16:08	34° 29.99' S	37° 48.71' W	4622	CTD/RO
MSM60/363-1	266 XBT	25.01.2017	18:08	34° 29.99' S	37° 55.68' W	4610.1	XBT
MSM60/364-1	267 XBT	25.01.2017	18:09	34° 29.99' S	37° 55.91' W	4612.3	XBT
MSM60/365-1	268 XBT	25.01.2017	19:07	34° 29.99' S	38° 8.89' W	4626.7	XBT
MSM60/366-1	269 XBT	25.01.2017	20:07	34° 29.99' S	38° 21.96' W	4731.8	XBT
MSM60/367-1	100 CTD	25.01.2017	22:23	34° 29.96' S	38° 27.96' W	4797.2	CTD/RO
MSM60/368-1	270 XBT	26.01.2017	00:35	34° 29.99' S	38° 35.09' W	4831.6	XBT
MSM60/369-1	271 XBT	26.01.2017	01:33	34° 29.99' S	38° 47.86' W	4822.5	XBT
MSM60/370-1	272 XBT	26.01.2017	02:32	34° 29.99' S	39° 0.76' W	4891.8	XBT
MSM60/371-1	101 CTD	26.01.2017	04:31	34° 30.01' S	39° 7.27' W	4893	CTD/RO
MSM60/372-1	273 XBT	26.01.2017	06:30	34° 29.99' S	39° 14.42' W	4874.1	XBT
MSM60/373-1	274 XBT	26.01.2017	07:23	34° 29.99' S	39° 27.48' W	4894	XBT
MSM60/374-1	275 XBT	26.01.2017	08:20	34° 29.99' S	39° 41.09' W	4834.5	XBT
MSM60/375-1	102 CTD	26.01.2017	10:17	34° 30.01' S	39° 46.59' W	4841.9	CTD/RO
MSM60/376-1	276 XBT	26.01.2017	12:21	34° 29.99' S	39° 53.71' W	4844.1	XBT
MSM60/377-1	277 XBT	26.01.2017	13:17	34° 29.99' S	40° 6.93' W	4819.7	XBT
MSM60/378-1	278 XBT	26.01.2017	14:12	34° 29.99' S	40° 19.93' W	4777.8	XBT
MSM60/379-1	103 CTD	26.01.2017	16:10	34° 29.97' S	40° 25.85' W	4737.4	CTD/RO
MSM60/380-1	279 XBT	26.01.2017	18:10	34° 29.99' S	40° 32.71' W	4687.3	XBT
MSM60/381-1	280 XBT	26.01.2017	19:05	34° 29.99' S	40° 45.83' W	4494.3	XBT
MSM60/382-1	281 XBT	26.01.2017	20:02	34° 29.99' S	40° 59.43' W	4613.4	XBT
MSM60/383-1	104 CTD	26.01.2017	21:57	34° 30.00' S	41° 5.16' W	4665.6	CTD/RO
MSM60/384-1	282 XBT	27.01.2017	00:07	34° 30.00' S	41° 12.46' W	4679.2	XBT
MSM60/385-1	283 XBT	27.01.2017	01:03	34° 29.99' S	41° 25.45' W	4694.6	XBT
MSM60/386-1	284 XBT	27.01.2017	02:01	34° 29.99' S	41° 38.32' W	4686.3	XBT
MSM60/387-1	105 CTD	27.01.2017	04:00	34° 30.02' S	41° 44.41' W	4681.7	CTD/RO
MSM60/388-1	285 XBT	27.01.2017	06:04	34° 29.99' S	41° 52.88' W	4681.1	XBT
MSM60/389-1	286 XBT	27.01.2017	06:56	34° 29.99' S	42° 4.81' W	4675.4	XBT
MSM60/390-1	287 XBT	27.01.2017	07:51	34° 29.99' S	42° 17.67' W	4670.7	XBT
MSM60/391-1	106 CTD	27.01.2017	09:45	34° 30.00' S	42° 23.76' W	4670.2	CTD/RO
MSM60/392-1	288 XBT	27.01.2017	11:46	34° 29.99' S	42° 31.03' W	4668.2	XBT

MSM60/393-1	289 XBT	27.01.2017	12:43	34° 29.99' S	42° 44.07' W	4675.9	XBT
MSM60/394-1	290 XBT	27.01.2017	13:41	34° 29.99' S	42° 57.26' W	4680.4	XBT
MSM60/395-1	107 CTD	27.01.2017	15:39	34° 30.03' S	43° 3.04' W	4685.4	CTD/RO
MSM60/396-1	291 XBT	27.01.2017	17:47	34° 29.99' S	43° 10.22' W	4704.2	XBT
MSM60/397-1	292 XBT	27.01.2017	18:43	34° 29.99' S	43° 23.48' W	4719.4	XBT
MSM60/398-1	293 XBT	27.01.2017	19:39	34° 29.99' S	43° 36.59' W	4728	XBT
MSM60/399-1	108 CTD	27.01.2017	21:35	34° 29.98' S	43° 42.32' W	4732.5	CTD/RO
MSM60/400-1	294 XBT	27.01.2017	23:40	34° 29.99' S	43° 49.68' W	4746.2	XBT
MSM60/401-1	295 XBT	28.01.2017	00:34	34° 29.99' S	44° 2.69' W	4751.8	XBT
MSM60/402-1	296 XBT	28.01.2017	01:27	34° 30.00' S	44° 15.63' W	4765.2	XBT
MSM60/403-1	297 XBT	28.01.2017	02:22	34° 29.99' S	44° 29.16' W	4772	XBT
MSM60/404-1	109 CTD	28.01.2017	03:59	34° 30.02' S	44° 30.00' W	4769.9	CTD/RO
MSM60/405-1	298 XBT	28.01.2017	06:19	34° 29.99' S	44° 42.31' W	4780.4	XBT
MSM60/406-1	299 XBT	28.01.2017	07:11	34° 29.99' S	44° 54.79' W	4778.9	XBT
MSM60/407-1	110 CTD	28.01.2017	09:09	34° 29.99' S	44° 59.98' W	4784.5	CTD/RO
MSM60/408-1	300 XBT	28.01.2017	11:24	34° 29.99' S	45° 8.10' W	4774.1	XBT
MSM60/409-1	301 XBT	28.01.2017	12:22	34° 29.99' S	45° 21.35' W	4771.5	XBT
MSM60/410-1	111 CTD	28.01.2017	14:33	34° 29.98' S	45° 29.96' W	4768.9	CTD/RO
MSM60/411-1	302 XBT	28.01.2017	16:33	34° 30.00' S	45° 34.06' W	4771.9	XBT
MSM60/412-1	303 XBT	28.01.2017	17:33	34° 29.99' S	45° 47.99' W	4768.9	XBT
MSM60/413-1	112 CTD	28.01.2017	19:56	34° 29.97' S	45° 59.96' W	4753.7	CTD/RO
MSM60/414-1	304 XBT	28.01.2017	21:32	34° 29.99' S	46° 1.15' W	4760	XBT
MSM60/415-1	305 XBT	28.01.2017	22:21	34° 29.99' S	46° 13.56' W	4726.5	XBT
MSM60/416-1	306 XBT	28.01.2017	23:13	34° 29.99' S	46° 26.89' W	4665.7	XBT
MSM60/417-1	113 CTD	29.01.2017	00:55	34° 29.95' S	46° 30.03' W	4651.9	CTD/RO
MSM60/418-1	307 XBT	29.01.2017	03:08	34° 29.99' S	46° 40.03' W	4605	XBT
MSM60/419-1	308 XBT	29.01.2017	03:59	34° 29.99' S	46° 53.22' W	4608.6	XBT
MSM60/420-1	114 CTD	29.01.2017	05:52	34° 30.11' S	47° 0.16' W	4617	CTD/RO
MSM60/421-1	309 XBT	29.01.2017	07:44	34° 29.99' S	47° 6.27' W	4608.5	XBT
MSM60/422-1	310 XBT	29.01.2017	08:36	34° 29.99' S	47° 19.46' W	4589.5	XBT
MSM60/423-1	115 CTD	29.01.2017	10:46	34° 29.99' S	47° 30.00' W	4564.6	CTD/RO
MSM60/424-1	311 XBT	29.01.2017	12:20	34° 29.98' S	47° 32.33' W	4555.7	XBT
MSM60/425-1	312 XBT	29.01.2017	14:51	34° 29.99' S	47° 45.31' W	4495.1	XBT
MSM60/426-1	313 XBT	29.01.2017	19:02	34° 29.98' S	47° 58.35' W	4382.5	XBT
MSM60/427-1	116 CTD	29.01.2017	20:38	34° 29.98' S	48° 0.01' W	4370.8	CTD/RO
MSM60/428-1	314 XBT	29.01.2017	22:59	34° 29.98' S	48° 11.07' W	4259.3	XBT
MSM60/429-1	315 XBT	29.01.2017	23:50	34° 30.00' S	48° 24.54' W	4136	XBT
MSM60/430-1	117 CTD	30.01.2017	01:33	34° 29.97' S	48° 29.99' W	4161	CTD/RO
MSM60/431-1	316 XBT	30.01.2017	03:25	34° 29.99' S	48° 38.01' W	4081.6	XBT
MSM60/432-1	317 XBT	30.01.2017	04:13	34° 29.99' S	48° 50.73' W	3953	XBT
MSM60/433-1	118 CTD	30.01.2017	06:30	34° 29.98' S	48° 59.96' W	3832.9	CTD/RO
MSM60/434-1	318 XBT	30.01.2017	08:17	34° 29.99' S	49° 5.14' W	3764.7	XBT
MSM60/435-1	319 XBT	30.01.2017	09:04	34° 29.99' S	49° 16.73' W	3623.6	XBT
MSM60/436-1	119 CTD	30.01.2017	11:12	34° 30.01' S	49° 29.99' W	3516.8	CTD/RO
MSM60/437-1	320 XBT	30.01.2017	13:30	34° 29.98' S	49° 42.71' W	3377.3	XBT
MSM60/438-1	321 XBT	30.01.2017	14:27	34° 30.00' S	49° 56.53' W	3258	XBT

MSM60/439-1	120 CTD	30.01.2017	15:48	34° 30.35' S	50° 0.02' W	3159.2	CTD/RO
MSM60/440-1	322 XBT	30.01.2017	17:54	34° 30.00' S	50° 10.21' W	3056.6	XBT
MSM60/441-1	323 XBT	30.01.2017	18:41	34° 29.99' S	50° 22.14' W	2942	XBT
MSM60/442-1	121 CTD	30.01.2017	20:12	34° 30.00' S	50° 30.01' W	2900.1	CTD/RO
MSM60/443-1	324 XBT	30.01.2017	21:38	34° 29.99' S	50° 35.90' W	2815.5	XBT
MSM60/444-1	325 XBT	30.01.2017	22:27	34° 29.98' S	50° 48.68' W	2783.3	XBT
MSM60/445-1	122 CTD	31.01.2017	00:07	34° 30.02' S	51° 0.02' W	2560.4	CTD/RO
MSM60/446-1	326 XBT	31.01.2017	01:11	34° 29.98' S	51° 1.75' W	2523.2	XBT
MSM60/447-1	123 CTD	31.01.2017	02:46	34° 30.01' S	51° 15.06' W	1896.2	CTD/RO
MSM60/448-1	327 XBT	31.01.2017	04:30	34° 30.00' S	51° 27.95' W	1460.9	XBT
MSM60/449-1	124 CTD	31.01.2017	05:11	34° 30.02' S	51° 30.04' W	1366.2	CTD/RO
MSM60/450-1	328 XBT	31.01.2017	05:50	34° 29.99' S	51° 32.49' W	1273	XBT
MSM60/451-1	125 CTD	31.01.2017	06:42	34° 30.03' S	51° 34.79' W	1194.6	CTD/RO
MSM60/452-1	126 CTD	31.01.2017	08:35	34° 18.01' S	51° 41.99' W	176.3	CTD/RO
MSM60/453-1	127 CTD	31.01.2017	11:14	34° 18.93' S	51° 41.45' W	326.8	CTD/RO
MSM60/454-1	329 XBT	31.01.2017	12:32	34° 23.21' S	51° 39.62' W	761.1	XBT
MSM60/455-1	330 XBT	31.01.2017	12:47	34° 20.80' S	51° 41.52' W	470.4	XBT
MSM60/456-1	128 CTD	31.01.2017	14:06	34° 10.00' S	51° 50.01' W	129.1	CTD/RO
MSM60/457-1	331 XBT	31.01.2017	14:59	34° 5.53' S	51° 52.71' W	97.4	XBT