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RV MARIA S. MERIAN
Short Cruise Report
Cruise MSM126

Funchal, Madeira (Portugal) - Las Palmas, Gran Canaria (Spain)
09.02.2024 – 04.03.2024
Chief Scientist: Dr. Jan Dierking
Captain: Klaus Bergmann

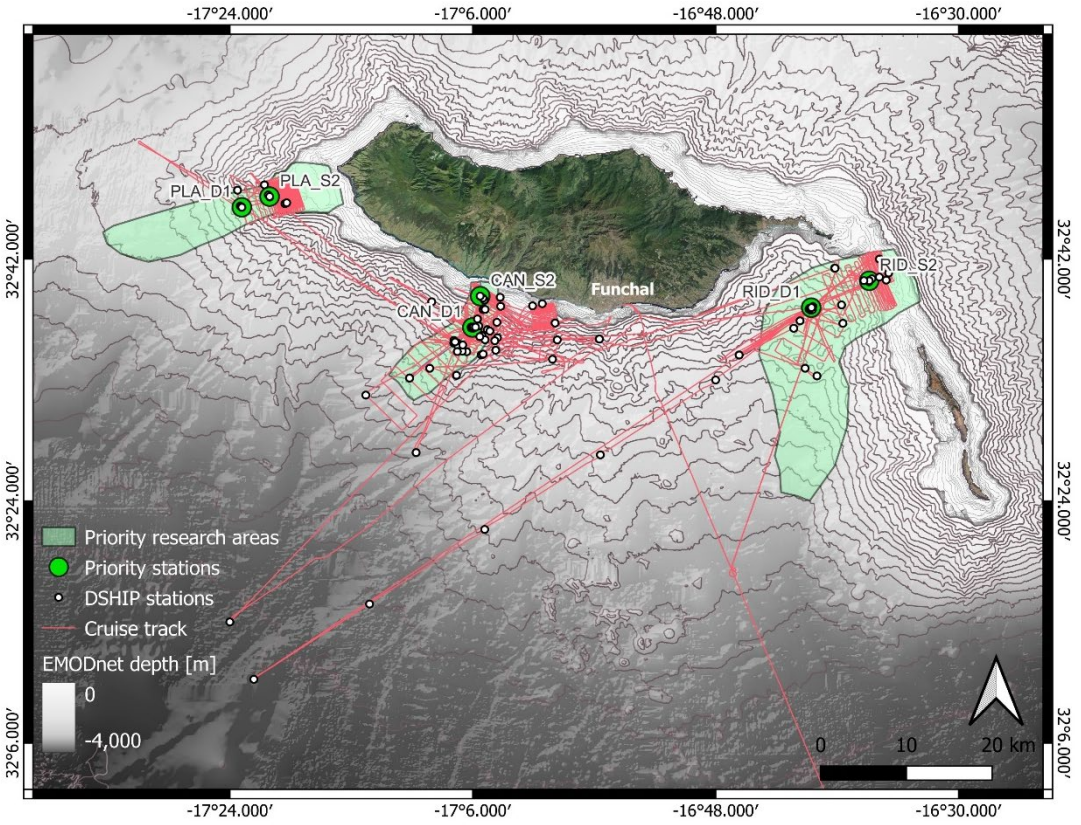

Figure 1 Working areas, cruise track and stations of cruise MSM126. “RID” = Madeira Desertas Ridge area, “CAN” = Ribeira Brava Canyon area, “PLA” = Plateau area. “Priority stations” refer to stations at 300 m (“S2”) and 1500 m (“D1”) depth in each priority area at which in-depth food web sampling was conducted. Stations >2000 m depth were only covered with WS-CTD casts.

Objectives

The focus of cruise MSM126 “Jellyweb Madeira” was on the pelagic deep sea, which harbors the most extensive but also least explored habitats for life on earth. A particular knowledge gap in this system concerns the biodiversity and functional role of gelatinous zooplankton (the “jelly web”). The overarching objectives of cruise MSM126 were to improve the understanding of deep-sea biodiversity and of the structure and functioning of food webs, focusing on the understudied marine systems surrounding Madeira Island in the Eastern Central Atlantic Ocean. In this context, the specific aims were:

1. To explore the biodiversity in the pelagic and benthic habitats surrounding Madeira, including the characterization of habitats present (sea floor topography, habitat types, physical and chemical profiles of the water column) and the observation and sampling of key taxa from different habitats, and conservation for later genetic and morphological analyses and for museum collections.
2. To enhance understanding of food webs in the pelagic zone, via sampling of key taxa from producers to higher trophic levels, with a key focus on gelatinous zooplankton and conservation for laboratory analysis with dietary tracers.
3. To assess the connectivity of the pelagic zone and sea floor food webs, via observation of natural food falls, food fall experiments and sampling of benthic fauna for the inclusion in dietary tracer analyses.

To address these objectives and aims, we conducted habitat and biodiversity exploration and dedicated food web sampling, using a wide range of established and novel in-situ observation (e.g., pelagic and benthic camera observation systems, remotely operated vehicle ROV PHOCA), remote sensing (multibeam mapping, ADCP), measurement (CTD and additional sensors) and sampling technology (various nets, ROV PHOCA pelagic and benthic samplers, water samplers).

Work on board also included behavioral, physiological and neurophysiology experiments. The large sample sets obtained during cruise MSM126 will be the focus of laboratory analyses including (meta-)genomic and stable isotope analysis, as well as taxonomic (visual and molecular) identification and deposition of biological samples as voucher organisms in different museums after the cruise.

Narrative

After setting up all equipment and laboratories on board of RV MARIA S. MERIAN during the period Feb. 6 – 9, we departed from Funchal harbor as scheduled on Feb. 9, 2024, 18:00 UTC, with 22 scientists and technicians and the 24 members of the permanent crew on board. The first station RID_D1 in the Madeira Desertas Ridge working area (Figure 1) was reached on Feb. 9 at 19:30 UTC, where scientific operations of MSM126 began with the first CTD-water sampler cast. From this point on, work was conducted in continuous 24-hour operations, benefiting from near flawless performance of all gears, good weather and sea-state conditions and fantastic working conditions on board.

The first week of the cruise from Feb. 9 to 16 was focused on the first of our three priority working areas, the Madeira Desertas Ridge ("RID") (Figure 1). Specific work included multibeam mapping of the topography of this area, daytime and nighttime biodiversity and food web sampling with diverse nets and the water sampler on the deep 1500 m (RID_D1) and shallow 300 m (RID_S2) priority stations, pelagic (PELAGIOS) and sea floor (XOFOS) optical surveys, the latter from 70 down to 1200 m depth, as well as pelagic and benthic ROV deployments for optical biodiversity and habitat observations and the sampling of pelagic and benthic fauna. Notably, the pelagic ROV deployment also included the first successful sampling of delicate gelatinous deep-sea fauna with two new custom designed sampling tools for midwater use, D-samplers and a suction sampler, on Feb. 11, which were then fine-tune and applied successfully over the duration of the cruise. Oceanographic work in the RID area included multiple water sampler-CTD profiles and ADCP long-term stationary and transect observations. The latter included a 12-hour ADCP transect combined with repeated water sampler-CTD deployments across a developing oceanographic feature, as ground-truthing to the simultaneous overflights of the SWOT (Surface Water and Ocean Topography) satellite on Feb. 13, 2024. Moreover, the on-board respiration-, neurophysiology and behavioral experiments with pelagic gelatinous taxa and amphipods were set up. Experimental runs were then conducted over the entire duration of the cruise.

After the successful completion of all planned work in the RID area on Feb. 16 at 16:30 UTC, we relocated to the second of our three priority areas, the Ribeira Brava Canyon ("CAN") on the central southern side of Madeira (Figure 1), where operations recommenced on Feb. 16 at 19:30 UTC. From Feb. 16 – Mar. 3, the same work program carried out in the RID area, i.e., mapping with multibeam and camera-transects, optical observations, biodiversity and food web sampling, as well as the characterization of the physical conditions and current dynamics, was then successfully repeated in the CAN and in the extensive plateau (PLA) area on the southwest side of Madeira. Due to the sheltered nature of the CAN area and more exposed nature of the PLA area, we relocated between these areas two times depending on weather conditions, which allowed us to maintain the continuous 24-hours operation.

In addition to the in-depth coverage of the three priority areas, ROV PHOCA was used to carry out a food fall experiment at 1500 m depth in the CAN area, with the deployment of a simulated food fall on Feb. 18 and recovery on Feb. 29. Moreover, the proximity of the CAN area to Funchal harbor was exploited to realize board visits of the film maker Uli Kunz (Submaris) and colleagues to obtain footage for an outreach film on the expedition (see: https://www.youtube.com/watch?v=BESqhUuX9cY), as well as of

taxonomic experts and resource management agency representatives (Directorate of the Sea) from Madeira. These visits were realized on Feb. 20, 23, 25, and 27 with the help of the expedition boat of cruise partner MARE Madeira/ARDITI Portugal, and benefited from the helpful advice regarding weather conditions and suitable transfer locations of Captain Bergmann and his crew.

The scientific program of cruise MSM126 was completed with a last CTD haul on Mar. 3 at 2:21 UTC. RV MARIA S. MERIAN then entered Funchal harbor at 08:00 UTC on March 2, 2024, for a short visit to drop off Madeira researchers and equipment, before embarking on the transit to Las Palmas, Gran Canaria, where the vessel arrived on March 3 at 21:30 UTC, thus ending the seagoing part of expedition MSM126. The station list and summary of gear deployments (Table 1) are provided below.

Experiencing the diversity of the underwater habitats and of the deep-water fauna around Madeira was a privilege and a continuous source of wonder to all of us cruise participants. Among the cruise highlights were (1) the mapping of deep water kelp forests at 70 -100 m depth in the RID area (discovered only a few years ago and the deepest kelp found to date worldwide), (2) ROV pelagic sampling during cruise MSM126, which resulted in a unique sample set of rare fauna, including fragile gelatinous organisms like salps, hydromedusae and chaetognaths, with at least 50 first records of species for Madeira waters (Figure 5), and (3) the successful implementation of the in-depth food web sampling strategy envisioned prior to the cruise, which is now providing a unique foundation for food web studies integrating the “jelly web” with traditional non-gelatinous food web players. An operational conclusion of the cruise was the confirmation of the value of oceanic islands as “protected” working areas under most weather and wind conditions, as the lee protection of Madeira has sheltered us from oftentimes large swells and strong winds in the operations area during the cruise period.

Table 1 Summary of gear deployments during cruise MSM126, by priority working area. Gear abbreviations: WS-CTD = Water sampler – CTD; IKMT = Isaac Kidd Midwater Trawl; MSN = Multi opening-closing net; PLA, WP3 and WP2 = plankton nets with different mesh sizes and net opening; OFOS = Ocean Floor Observation System; ROV = Remotely operated vehicle PHOCA; TSG = Thermosalinograph).

Gear	Underway	PLA	CAN	RID	EDD	Purpose	Total
WS-CTD		6	35	16	5	Oceanographic profiles; water samples	62
BONGO		2	5	3		Shallow mesoplankton sampling (to 250 m)	10
IKMT		1	5	2		Meso- and macroplankton sampling (to 800 m)	8
MSN		4	6	7		Depth-resolved plankton sampling (to 1000 m)	17
PLA		1	7	8		(Gelatinous) plankton sampling (to 250 m)	16
WP3				1		(Gelatinous) plankton sampling (to 250 m)	1
WP2			1			Plankton sampling (to 250 m)	1
OFOS		1	4	3		Optical Ocean Floor Observation System	8
PELAGIOS			1	2		Optical Pelagic Observation System	3
ROV			13	5		Optical observations; benthic & pelagic sampling	18
Multibeam	3	3	10	4		Mapping	20
TSG	2					Temperature and salinity transect	2
ADCP	2		1		1	Current measurements	4
Total	7	18	88	51	6		170

Pictures of on-board operations and observations

Figure 2 ROV PHOCA deployment during cruise MSM126. Photo: Dierking

Figure 3 Midwater visitor: a squid above the detritus sampler of the Remotely Operated Vehicle (ROV) PHOCA. Photo: GEOMAR ROV team.

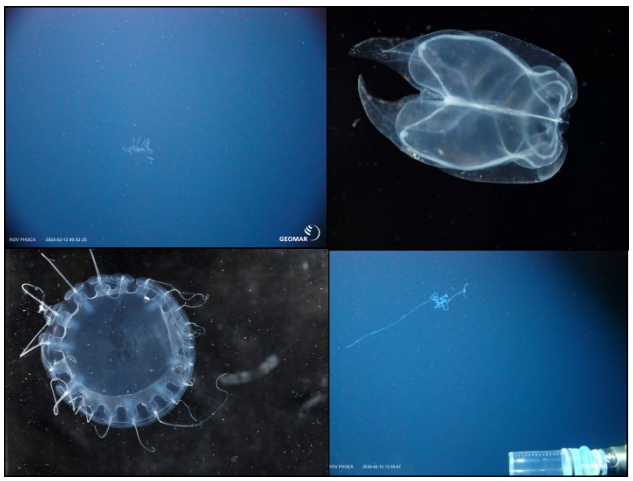

Figure 4 Midwater organisms photographed in-situ in their natural habitat during the capture with ROV PHOCA (top left, bottom right) and in the laboratory on board (bottom left, top right). Left side: the diner plate jellyfish Solmissus; right side: a siphonophore, with the top panel also showing the suction sampler of the ROV, bottom panel providing close up of part of the animal. Photos in situ: GEOMAR ROV team; laboratory: Karen Osborn

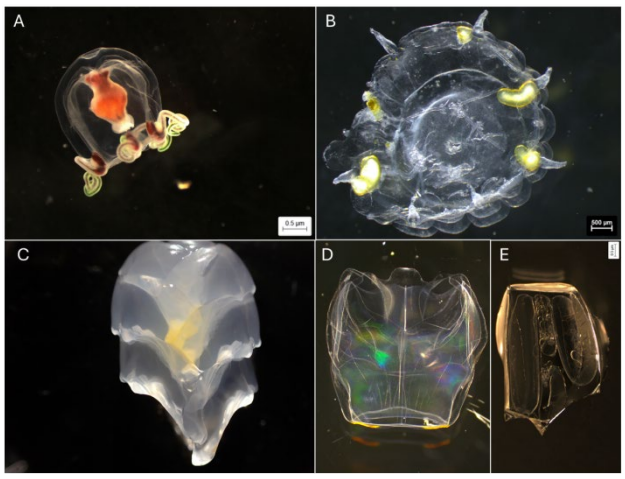

Figure 5 3 Some of the new records for Madeira Island: A: the anthomedusa *Cysteis* sp.; B: the coronamedusa *Nausithoe marginata*; C, D and E: the siphonophores, *Hippopodius hippopus*, *Marrus* sp., and *Ceratocymba leuckarti*. Photos: Sonia KM Gueroun.

Figure 6 Four members of the “midwater world” around Madeira caught during plankton sampling with the IKMT plankton net and the ROV pelagic samplers on stations RID_D1 and CAN_D1. Clockwise from top left: pteropod *Diacavolinia*, Hatchet fish, juvenile squid *Histioteuthis*, leptocephalus eel larva. Photos: K. Osborn

Figure 7 RV MARIA S. MERIAN on station CAN_D1 in the Ribeira Brava Canyon area. Photo: F. Huber.

Acknowledgements

We want to thank Captain Klaus Bergmann and the entire crew of MARIA S. MERIAN for the outstanding support throughout cruise MSM126 – this success is yours as much as ours! We are also grateful for the support and advice received from the German Research Fleet Coordination Centre at Universität Hamburg, and the logistical support and scientific advice from our Madeira collaborators, in particular Joao Canning-Clode, Manuel Biscoito, Andreia Braga-Henriques and Mafalda Freitas. We also want to acknowledge the help from countless persons within GEOMAR, including the Marine Evolutionary Ecology, TLZ, customs, media, data management and ship coordination teams. Ship time and financial support for cruise logistics was provided by the DFG under proposal GPF 19-1_117_Jellyweb_Madeira.

Cruise participants

Name and title	Discipline	Institution
Jan Dierking, Dr.	Fahrtleiter/Chief scientist; Marine Ecology	GEOMAR
Henk-Jan Hoving, Dr.	Deputy chief scientist; Deep-sea biology	GEOMAR
Hendrik Hampe	Technician PELAGIOS, XOFOS, nets	GEOMAR
Julian Stauffer, MSc.	PhD student; Multibeam, PELAGIOS, XOFOS	GEOMAR
Anton Höper, BSc.	MSc. student; technical help net deployments, sampling	UHAM-IMF
Anton Theileis	Technician PISCO and UVP6; high resolution plankton water profiles	GEOMAR
Martin Pieper	ROV pilot/technician; ROV board team lead	GEOMAR
Torge Matthiessen	ROV pilot/technician	GEOMAR
Hannes Huusmann	ROV pilot/technician	GEOMAR
Peter Striewski	ROV pilot/technician	GEOMAR
Patrick Cuno	ROV pilot/technician	GEOMAR
Marco Schulz, MSc.	PhD student; Physical Oceanography	GEOMAR
Sophie Schindler, MSc.	Data management	GEOMAR
Vanessa Stenvers, MSc.	PhD student; midwater biology, behaviour experiments	GEOMAR
Babett Günther, Dr.	Food fall experiments, eDNA sampling	GEOMAR
Nicole Aberle-Malzahn, Prof.	Microzooplankton	UHAM-IMF
Florian Lüskow, Dr.	Gelatinous zooplankton taxonomy and ecology; respiration experiments	AWI
Manfred Kaufmann, Dr.	Plankton ecology; Madeira system expert	MARE-ARDITI; UMAD
Sonia Gueroun, Dr.	Gelatinous zooplankton taxonomy; Madeira system expert	MARE-ARDITI
Jamileh Javidpour, Prof.	Gelatinous zooplankton; food web ecology	SDU
Karen Osborn, Dr.	Taxonomy of midwater fauna; museum curator, photographer	SNMNH
Jan Hemmi, Dr.	Neurophysiology; board experiments	UWA

Institutes

Abbreviation	Full name
GEOMAR	Helmholtz-Centre for Ocean Research Kiel, Germany
UHAM – IMF	Hamburg University – Institute of Marine Ecosystem and Fishery Science, Germany
AWI	Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany
SDU	University of Southern Denmark, Odense, Denmark
MARE-ARDITI	Marine and Environmental Sciences Centre - Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação, Funchal, Madeira, Portugal
UMAD	University of Madeira, Portugal
SNMNH	Smithsonian National Museum of Natural History, Washington DC, USA
UWA	University of Western Australia, Perth, Australia

Station list

Event	Abbreviation	Date/Time	Lat (°N)	Long (°W)	Depth (m)
MSM126_0_Underway-3	SWEAS	2024-02-06T08:26:56	32.64282	-16.91464	42
MSM126_0_Underway-6	TSG	2024-02-09T18:17:00	32.62039	-16.84237	3709
MSM126_0_Underway-4	VMADCP-38	2024-02-09T18:17:07	32.62044	-16.84205	712
MSM126_0_Underway-5	EM712	2024-02-09T18:17:45	32.6207	-16.84002	720
MSM126_1-1	WS-CTD	2024-02-09T19:52:00	32.63976	-16.68193	1549
MSM126_0_Underway-8	EM122	2024-02-09T20:00:40	32.63973	-16.68194	1518
MSM126_2-1	EM712	2024-02-09T21:20:10	32.62027	-16.64286	1376
MSM126_0_Underway-7	VMADCP-75	2024-02-10T07:18:18	32.7042	-16.61716	
MSM126_3-1	WS-CTD	2024-02-10T08:09:07	32.67304	-16.61028	379
MSM126_3-2	PLA	2024-02-10T09:32:08	32.67303	-16.61029	385
MSM126_3-3	BONGO	2024-02-10T10:09:05	32.67294	-16.61039	395
MSM126_3-4	PELAGIOS	2024-02-10T12:06:49	32.67325	-16.61074	417
MSM126_3-5	MSN	2024-02-10T14:24:15	32.6727	-16.61002	377
MSM126_3-6	IKMT	2024-02-10T15:50:41	32.67167	-16.61056	364
MSM126_3-7	XOFOS	2024-02-10T17:43:09	32.6728	-16.61215	479
MSM126_4-1	EM712	2024-02-10T19:32:20	32.67553	-16.607	208
MSM126_5-1	PLA	2024-02-11T05:16:22	32.63975	-16.682	1517
MSM126_5-2	BONGO	2024-02-11T05:59:10	32.64113	-16.67994	1592
MSM126_5-3	WS-CTD	2024-02-11T07:30:41	32.6397	-16.68197	1556
MSM126_5-4	ROV	2024-02-11T09:10:51	32.63925	-16.6826	1566
MSM126_5-5	MSN	2024-02-11T17:37:16	32.63799	-16.68224	1614
MSM126_6-1	PELAGIOS	2024-02-11T20:10:09	32.63815	-16.68371	1633
MSM126_7-1	WS-CTD	2024-02-12T00:19:57	32.56457	-16.68945	2039
MSM126_8-1	EM122	2024-02-12T01:20:12	32.55506	-16.67487	1983
MSM126_9-1	PLA	2024-02-12T05:40:00	32.63973	-16.68199	1564
MSM126_9-2	BONGO	2024-02-12T06:24:11	32.63653	-16.68272	2531
MSM126_9-3	WS-CTD	2024-02-12T10:09:18	32.62337	-16.69578	1800
MSM126_9-4	ROV	2024-02-12T11:20:03	32.61412	-16.70354	1884

MSM126_9-5	WS-CTD	2024-02-12T18:26:41	32.63973	-16.68197	1562
MSM126_10-1	XOFOS	2024-02-12T20:11:14	32.69987	-16.59769	95
MSM126_11-1	WS-CTD	2024-02-13T07:28:00	32.6397	-16.68197	1595
MSM126_11-2	ROV	2024-02-13T09:02:45	32.64015	-16.68114	1512
MSM126_12-1	VMADCP-38	2024-02-13T17:25:52	32.63841	-16.68391	1633
MSM126_12-2	VMADCP-75	2024-02-13T17:26:09	32.63791	-16.68467	1637
MSM126_13-1	WS-CTD	2024-02-13T22:12:36	32.17889	-17.37035	4229
MSM126_14-1	WS-CTD	2024-02-14T00:10:36	32.27223	-17.22744	4052
MSM126_15-1	WS-CTD	2024-02-14T02:01:25	32.36471	-17.08525	3394
MSM126_16-1	WS-CTD	2024-02-14T03:53:29	32.45721	-16.94236	2718
MSM126_17-1	WS-CTD	2024-02-14T05:56:47	32.55001	-16.80001	2246
MSM126_18-1	PLA	2024-02-14T08:03:16	32.63971	-16.68197	1526
MSM126_18-2	WP3	2024-02-14T08:49:27	32.63972	-16.68199	1529
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MSM126_18-4	IKMT	2024-02-14T12:33:37	32.63905	-16.68279	1618
MSM126_18-5	MSN	2024-02-14T15:37:38	32.63905	-16.68396	1548
MSM126_18-6	WS-CTD	2024-02-14T19:21:42	32.63973	-16.68199	1546
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MSM126_20-1	XOFOS	2024-02-14T21:39:13	32.68272	-16.58629	82
MSM126_21-1	EM712	2024-02-15T01:30:10	32.67386	-16.58933	127
MSM126_22-1	PLA	2024-02-15T06:03:18	32.63971	-16.68199	1525
MSM126_22-2	PLA	2024-02-15T07:18:46	32.6397	-16.68197	1593
MSM126_22-3	MSN	2024-02-15T08:16:59	32.63971	-16.68197	1608
MSM126_23-1	ROV	2024-02-15T10:54:15	32.64312	-16.64449	1246
MSM126_24-1	WS-CTD	2024-02-15T18:51:06	32.58103	-16.77097	1987
MSM126_24-2	WS-CTD	2024-02-15T20:10:29	32.58103	-16.77098	1988
MSM126_24-3	WS-CTD	2024-02-15T21:31:18	32.58103	-16.77097	1986
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MSM126_25-2	PLA	2024-02-16T00:34:54	32.63978	-16.68158	1568
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MSM126_26-2	WS-CTD	2024-02-16T03:54:34	32.58094	-16.77095	1986
MSM126_26-3	WS-CTD	2024-02-16T05:14:30	32.58094	-16.77095	1986
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MSM126_27-3	PLA	2024-02-16T07:58:57	32.67304	-16.61035	363
MSM126_28-1	ROV	2024-02-16T09:17:45	32.67322	-16.61688	609
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MSM126_33-1	PLA	2024-02-17T17:24:54	32.61512	-17.10045	1531
MSM126_34-1	WS-CTD	2024-02-17T20:30:30	32.45997	-17.16997	3489
MSM126_35-1	IKMT	2024-02-17T23:02:02	32.61529	-17.10098	1536
MSM126_35-2	MSN	2024-02-18T01:08:07	32.61538	-17.10026	1524
MSM126_36-1	EM712	2024-02-18T02:50:30	32.63734	-17.08731	1024
MSM126_36-2	EM122	2024-02-18T03:23:42	32.59992	-17.08484	
MSM126_37-1	WS-CTD	2024-02-18T07:23:30	32.61514	-17.10046	1517
MSM126_38-1	ROV	2024-02-18T09:23:18	32.61458	-17.0994	1480
MSM126_39-1	ROV	2024-02-18T12:52:16	32.64917	-17.08569	524

MSM126_40-1	PLA	2024-02-18T17:36:32	32.61513	-17.10047	1519
MSM126_41-1	WS-CTD	2024-02-18T19:54:16	32.55245	-17.17796	3016
MSM126_41-2	WS-CTD	2024-02-18T21:50:57	32.55251	-17.17796	3011
MSM126_41-3	WS-CTD	2024-02-18T23:37:19	32.55236	-17.17802	3015
MSM126_41-4	WS-CTD	2024-02-19T01:26:04	32.55237	-17.17804	3015
MSM126_41-5	WS-CTD	2024-02-19T03:06:07	32.55237	-17.17803	3011
MSM126_41-6	WS-CTD	2024-02-19T04:41:33	32.55238	-17.17804	3012
MSM126_42-1	MSN	2024-02-19T06:25:44	32.61512	-17.10047	1528
MSM126_42-2	MSN	2024-02-19T07:45:48	32.61515	-17.10047	1528
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MSM126_42-7	WP2	2024-02-19T17:59:10	32.61514	-17.10048	1524
MSM126_43-1	XOFOS	2024-02-19T18:58:13	32.62152	-17.07019	546
MSM126_44-1	PELAGIOS	2024-02-19T21:48:44	32.60242	-17.06952	1402
MSM126_45-1	EM712	2024-02-20T01:38:58	32.64132	-17.06552	347
MSM126_46-1	WS-CTD	2024-02-20T06:18:54	32.62568	-17.09423	1220
MSM126_46-2	PLA	2024-02-20T06:49:08	32.62568	-17.09423	1221
MSM126_46-3	ROV	2024-02-20T09:01:25	32.61238	-17.08195	816
MSM126_46-4	ROV	2024-02-20T12:51:21	32.58512	-17.10736	1602
MSM126_47-1	PLA	2024-02-20T19:42:39	32.7642	-17.38525	1511
MSM126_47-2	WS-CTD	2024-02-20T21:15:20	32.76419	-17.38522	1516
MSM126_48-1	EM712	2024-02-20T22:18:06	32.79197	-17.3572	470
MSM126_49-1	MSN	2024-02-21T06:58:19	32.76418	-17.38523	1537
MSM126_49-2	MSN	2024-02-21T08:29:57	32.76419	-17.38523	1540
MSM126_49-3	IKMT	2024-02-21T10:02:00	32.76577	-17.38725	1523
MSM126_49-4	WS-CTD	2024-02-21T14:47:34	32.7641	-17.38533	1528
MSM126_49-5	WS-CTD	2024-02-21T16:38:09	32.76411	-17.38534	1522
MSM126_49-6	BONGO	2024-02-21T17:18:54	32.76476	-17.38566	1556
MSM126_50-1	XOFOS	2024-02-21T18:45:42	32.76861	-17.33202	69
MSM126_51-1	EM712	2024-02-21T23:11:56	32.76968	-17.32981	70
MSM126_52-1	WS-CTD	2024-02-22T05:13:17	32.77739	-17.35094	413
MSM126_52-2	BONGO	2024-02-22T05:38:44	32.77949	-17.35263	381
MSM126_52-3	MSN	2024-02-22T06:45:39	32.77731	-17.35084	351
MSM126_53-1	ROV	2024-02-22T09:53:12	32.59349	-17.11571	
MSM126_54-1	IKMT	2024-02-22T18:35:11	32.57569	-17.00148	1857
MSM126_55-1	WS-CTD	2024-02-22T23:00:14	32.56455	-17.15316	2684
MSM126_56-1	EM122	2024-02-23T00:14:37	32.55585	-17.12016	2030
MSM126_57-1	WS-CTD	2024-02-23T05:54:34	32.5313	-17.23211	3292
MSM126_58-1	WS-CTD	2024-02-23T08:44:04	32.61692	-17.09261	1237
MSM126_59-1	PLA	2024-02-23T09:51:09	32.65379	-17.09061	365
MSM126_59-2	WS-CTD	2024-02-23T10:41:50	32.65397	-17.09093	354
MSM126_59-3	BONGO	2024-02-23T11:13:54	32.65156	-17.08755	513
MSM126_59-4	MSN	2024-02-23T12:29:33	32.65411	-17.09088	361
MSM126_60-1	VMADCP-38	2024-02-23T22:20:14	32.68863	-16.65314	
MSM126_60-2	VMADCP-75	2024-02-23T22:20:35	32.68862	-16.65257	
MSM126_61-1	ROV	2024-02-24T11:20:04	32.59913	-17.12326	1796
MSM126_62-1	PLA	2024-02-24T17:49:50	32.61515	-17.10047	1530
MSM126_62-2	WS-CTD	2024-02-24T18:54:55	32.61512	-17.10045	1535

MSM126_63-1	XOFOS	2024-02-24T20:08:03	32.61065	-17.07887	
MSM126_64-1	EM712	2024-02-25T00:49:07	32.60374	-17.09132	1081
MSM126_65-1	BONGO	2024-02-25T06:41:21	32.59576	-17.12348	1989
MSM126_65-2	WS-CTD	2024-02-25T08:24:06	32.59588	-17.11905	1910
MSM126_66-1	ROV	2024-02-25T10:06:32	32.59663	-17.1207	1919
MSM126_67-1	WS-CTD	2024-02-25T19:57:33	32.76411	-17.38518	1510
MSM126_67-2	MSN	2024-02-25T20:32:19	32.76411	-17.38518	1501
MSM126_68-1	MSN	2024-02-25T22:21:18	32.77691	-17.3507	318
MSM126_69-1	EM712	2024-02-25T23:17:24	32.78533	-17.39052	1351
MSM126_70-1	WS-CTD	2024-02-26T06:42:01	32.77745	-17.35091	360
MSM126_71-1	ROV	2024-02-26T09:20:36	32.59564	-17.12093	1974
MSM126_72-1	BONGO	2024-02-26T18:05:18	32.5914	-17.11811	1869
MSM126_73-1	IKMT	2024-02-26T21:03:07	32.59722	-17.12183	1920
MSM126_74-1	EM712	2024-02-26T23:39:00	32.64195	-17.02612	91
MSM126_75-1	PLA	2024-02-27T06:48:13	32.59873	-17.0728	1396
MSM126_75-2	WS-CTD	2024-02-27T08:30:06	32.58122	-17.08946	1642
MSM126_76-1	ROV	2024-02-27T09:31:22	32.58214	-17.08713	1688
MSM126_77-1	XOFOS	2024-02-27T19:50:10	32.64459	-17.01412	59
MSM126_78-1	MSN	2024-02-28T00:43:13	32.6541	-17.09089	348
MSM126_79-1	EM712	2024-02-28T01:56:25	32.62064	-16.99831	278
MSM126_79-2	EM122	2024-02-28T03:48:43	32.59974	-16.99565	
MSM126_80-1	WS-CTD	2024-02-28T06:12:45	32.60073	-16.94364	1098
MSM126_80-2	WS-CTD	2024-02-28T07:02:57	32.60073	-16.94364	1095
MSM126_80-3	WS-CTD	2024-02-28T07:53:41	32.60074	-16.94363	1091
MSM126_80-4	WS-CTD	2024-02-28T08:46:10	32.60074	-16.94363	1092
MSM126_80-5	WS-CTD	2024-02-28T09:38:15	32.60074	-16.94363	1093
MSM126_81-1	IKMT	2024-02-28T11:54:35	32.58692	-17.07158	1675
MSM126_81-2	BONGO	2024-02-28T15:54:59	32.61447	-17.10189	1556
MSM126_82-1	WS-CTD	2024-02-28T18:03:50	32.60076	-16.94366	1096
MSM126_82-2	WS-CTD	2024-02-28T18:58:35	32.60075	-16.94365	1098
MSM126_82-3	WS-CTD	2024-02-28T20:06:22	32.60075	-16.94366	1096
MSM126_82-4	WS-CTD	2024-02-28T20:59:11	32.60072	-16.94364	1101
MSM126_82-5	WS-CTD	2024-02-28T21:54:09	32.60081	-16.94363	1098
MSM126_83-1	EM712	2024-02-28T23:07:15	32.63748	-17.0848	952
MSM126_84-1	WS-CTD	2024-02-29T06:35:00	32.61512	-17.10046	1525
MSM126_85-1	ROV	2024-02-29T09:34:13	32.61396	-17.09983	1480
MSM126_86-1	ROV	2024-02-29T14:30:56	32.58582	-17.1129	1677
MSM126_87-1	XOFOS	2024-02-29T21:03:24	32.65251	-17.06616	110
MSM126_88-1	WS-CTD	2024-03-01T06:23:07	32.61577	-17.09918	1499
MSM126_88-2	WS-CTD	2024-03-01T07:37:42	32.61555	-17.09653	1415
MSM126_89-1	ROV	2024-03-01T09:56:58	32.58527	-17.11907	1910
MSM126_90-1	NET	2024-03-01T16:03:44	32.59344	-17.11239	1638
MSM126_91-1	WS-CTD	2024-03-01T23:57:01	32.24995	-17.40001	4291
MSM126_91-2	WS-CTD	2024-03-02T02:21:07	32.24999	-17.40006	4239
MSM126_0_Underway-10	VMADCP-75	2024-03-02T15:00:17	32.60358	-16.88877	
MSM126_0_Underway-9	VMADCP-38	2024-03-02T15:00:58	32.60163	-16.88825	
MSM126_0_Underway-12	TSG	2024-03-02T15:05:43	32.58751	-16.88413	1632
MSM126_0_Underway-11	EM122	2024-03-02T15:08:48	32.57834	-16.88145	1761