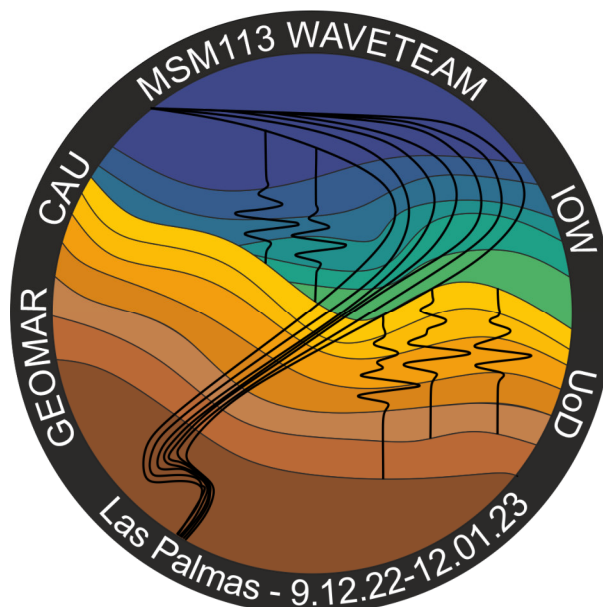


Prof. Dr. Sebastian Krastel
Christian-Albrechts-Universität zu Kiel
Institute of Geosciences
Otto-Hahn-Platz 1
D24118 Kiel, Germany

Tel.: +49-431-880 3914
Fax: +49-431-880 4432
email: sebastian.krastel@ifg.uni-kiel.de

Short Cruise Report
RV MARIA S. MERIAN - Cruise MSM113

Las Palmas – Las Palmas – Emden
09.12.2022 – 12.01.2023
Chief Scientist: Prof. Dr. Sebastian
Krastel Captain: Ralf Schmidt



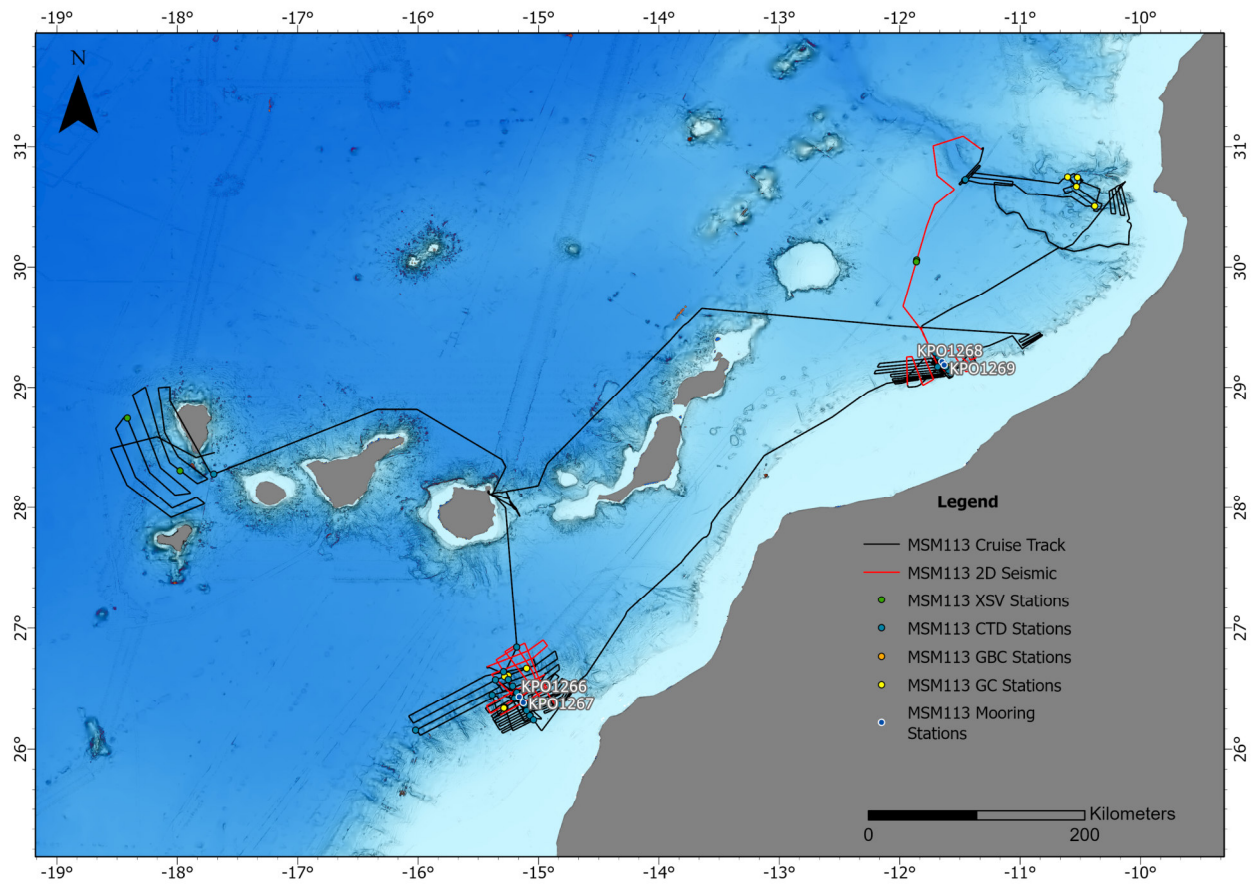


Fig 1: Track chart of Cruise MSM113 (Las Palmas – Las Palmas).

Objectives

Sediment waves are the dominant bedform on the ocean floor. They are important for any seafloor infrastructure, such as telecommunication cables, as the flows passing over can be highly destructive. Further, sediment waves play an important role in the stability of marine slopes. The hypotheses evoked for sediment wave generation are internal waves, downslope turbidity currents, along-slope currents, and at continental slopes also sediment creep. However, the mechanisms for generating these bedforms remain poorly constrained. Often an academic divide exists between the disciplines that study processes associated to ocean dynamics at and distant from the sediment water interface, resulting in a lack of across-disciplinary studies that address formation processes. During Cruise MSM113, we realized an interdisciplinary approach, including a variety of geophysical, geological, geotechnical and oceanographic methods, to study processes that lead to the formation of large fields of sediment waves at the Northwest African margin and to test the following hypotheses:

- Sediment waves are caused by strong internal waves (“baroclinite”/internal tidalite system), which are breaking over diverse sloping bottom topography.
- Alongslope currents influence the formation of sediment waves (hybrid turbidite-contourite system) and interact, deflect and/or limit the downslope turbiditic currents.
- It is possible to derive paleo-currents from sediment wave geometries.

We mapped large areas of the Northwest African slope hosting sediment waves with hydroacoustic and seismic methods and combined these with oceanographic measurements of the water column to gain insight into the dynamics of processes that act across the water-sediment interface. Direct evidence from oceanographic moorings with pressure-, temperature-sensors and acoustic doppler current profilers completed the interdisciplinary data set. Subsurface information from seismic data and sedimentological data from sediment cores will untangle the complex interplay of ocean dynamics and surface morphology as well as evolution through time. We expect to gain new insight into the formation of sediment waves with essential findings to improve our understanding of sediment wave generation and their importance for marine infrastructure and slope stability in the marine realm.

Furthermore, the western unstable flank of the Cumbre Vieja volcano (La Palma) was mapped as part of a supplementary application. In late 2021, Cumbre Vieja volcano, that builds up the southern part of the island of La Palma, experienced its longest eruption in historic times. Although the eruption appears to have subsided for now, it is unclear what hazards are going forward, mainly because we do not know exactly what changed as a result of recent events, especially in the submarine portions of La Palma. There is ample evidence from geodetic and geological data onshore that the western flank of Cumbre Vieja is slowly sliding into the Atlantic Ocean. The marine continuation of the flank was mapped in detail during the cruise

Narrative

The scientific team of Cruise MSM113 boarded RV MARIA S. MERIAN in Las Palmas on the morning of Dec 8. The coring equipment was already onboard from Cruise MSM112, and the crew loaded the rest of the freight on Dec 7. The scientific crew embarking in Las Palmas consisted of 13 scientists from Kiel University, three scientists from the GEOMAR Helmholtz Centre for Ocean Research Kiel, 2 scientists from the Leibniz Institute for Baltic Sea Research Warnemünde, and one scientist from Durham University (UK). Cruise MSM113 was scheduled to depart on Dec 9 but a sea trial was needed on that day due to maintenance of the vessel propulsion system. In addition, a broken navigation sounder needed to be replaced. This work could only be done in the morning of Dec 10. Hence, RV MARIA S. MERIAN left the port of Las Palmas on Dec 10 at 12:15h

local time under sunny skies and very calm seas with a delay of more than one day.

We headed south from Las Palmas to our first working area located at the continental margin offshore Cape Bojador. The scientific program of RV Maria S. Merian Cruise MSM113 started with a CTD cast and a releaser test for the moorings at 20:30h on Dec 10 (Station MSM113_1). The CTD and the releaser test was successful. The night was used for a first short hydroacoustic survey of pronounced sediment waves in this area. We arrived at the first mooring location at the continental margin off Cap Bojador at 08:30h on Dec 11. The first ~700 m-long mooring was deployed after a CTD cast in ~1400m water depth. The mooring was placed on a very pronounced sediment wave. The second mooring was deployed in the afternoon ~3.5 nm upslope of the first mooring in ~1150m water depth. The moorings are equipped with ADCPs as well as pressure, temperature, and turbidity sensors. With this setting, we hope to document the passage of internal waves. Mooring work was finished at ~15:30h and we collected hydroacoustic data of the upper slope until the following morning. Parts of our survey needed to be modified due to fishing activities. We took a first sediment core on a wave crest between the two moorings in the morning of Dec 12 (Station MSM113_6-1). Core recovery was 8.72 m; the core mainly consist of bioturbated hemipelagic sediments. Coring was followed by a first seismic survey. We started with a line across the two moorings and connected the line to the DSDP-Sites 369 and 397. The survey was interrupted in the morning of Dec 13 due to a gun failure. The survey was continued after the gun was exchanged and watching out for marine mammals following the mitigation measures. The survey was interrupted again in the early afternoon as we had to exchange two streamer sections. After that, the survey was continued without any problems until the morning of Dec 14. Dec 14 was a full coring day. We collected 4 gravity cores across one sediment wave for analyzing the internal structure of the wave and variations in accumulation rate and grain size distribution. The first core was located on the same sediment wave as the deeper mooring (Station MSM113_8-1). The second core of the day was collected on the crest of the wave being located downslope of the first core (MSM113_9-1). Core recovery for both cores was more than 9 meters. A prominent debrite was found at the bottom of both cores. Station MSM113_10 was placed in the wave trough between the two sediment waves mentioned before. We started with a CTD at this location (water depth ~1520m) followed by a gravity core. We decided to take only a five meter barrel because the Parasound data showed a hard sea floor return but the core overpenetrated. We repeated this core with a 10m barrel resulting in more than 9 m core recovery. The last core of the day was taken at the deepest point between the two waves very close to a steep flank. We continued with a 10 m barrel but this time we hit a very stiff seafloor with lots of sands. One core barrel bent but we still had about 1 m core recovery with lots of sands, showing the importance of sands in the system of sediment waves. We used the night of Dec 15 for further mapping of the continental slope. We started with a CTD at the lower slope in 2830m water depth on Dec 15. We deployed the seismic system afterwards. We collected 15 closely spaced lines across the area where we deployed the moorings in order to image lateral changes across single waves. Each line had a length of 10 nm. At the end of the survey we connected this grid of lines with a slope parallel line to DSDP-Site 369. This survey was completed without any interruption and the seismic system was retrieved on Dec 17 at 09:00h. After a short transit to the upper continental slope, we took a CTD in 1050 m water depth (MSM113_15). A 10m-long gravity core at this location brought 7.33 m of sediments on deck. Two additional cores were taken further upslope across another sediment wave in ~800m water depth. The wave pattern in this area is more regular. The first core (MSM113_16) had a recovery of about 4 meter. The second gravity core (MSM113_17) was taken at a location, where older strata is exposed at the sea floor. The very stiff material indicated that it was buried in former times. Core recovery was only 98 cm. Coring was followed by two long seismic reflection lines parallel to the lower slope. We crossed several ridges visible in the bathymetric data and the seismic data show

that they are underlain by buried mound-like features. The seismic gear was retrieved on Dec 18 around noon. Afterwards we took three gravity cores at the lower slope (MSM113_19 – 21) in order to quantify the overall sediment input through the numerous canyons and on the open slope. All three cores yielded good recovery. The following 36 hours were used for hydroacoustic mapping of previously unsurveyed area. The survey was interrupted for one CTD cast. Unfortunately, we needed to adjust the planned profiles due to numerous fishing vessels operating in our working area. The hydroacoustic survey was continued until noon of Dec 20. We collected three giant box cores in the afternoon of Dec 20. The first box core (MSM113_24) was located on a small mound. As expected, we recovered numerous cold water corals, which were all dead except for one. Cold water corals in this area have not been reported before. A CTD was collected at the same location. The two other box cores (MSM113_24 and 25) were located at two stations, where we had very little core recovery with gravity cores before. The night of Dec 21 was used for a CTD transect across the continental slope. CTDs were collected at 8 locations. Three gravity corers across a canyon were collected on Dec 21. The first core (MSM113_35) was located on a terrace approximate 300 m above the canyon thalweg. Core recovery was more than 8m. The other two cores (MSM113_36 and 37) were located in the thalweg and on a small terrace close to the thalweg. Both cores contained very coarse material. Core recovery was in the range of one meter. The night and the following day was used for another hydroacoustic survey. This survey was interrupted for another CTD and a Giant Box-Corer in an area, where abundant mounds are imaged by the bathymetric systems. The box corer at this location was full of corals. We retrieved the moorings in the morning of Dec 23. Before retrieval, we triangulated the exact position of the moorings. Recovery of the moorings went very smooth and both moorings were on deck before lunch. The seismic equipment was deployed for final slope parallel profiles in the first working area. The gear was retrieved on Dec 24 at 08:45h and followed by a CTD for calibration some of the sensors installed on the mooring.

Afterwards we started our transit to the second working area of Cape Draa, where we arrived on Dec 25 at 20:00h. It was planned to deploy the moorings on Dec 26 but due to strong winds we continued with a hydroacoustic survey using different devices until the morning of Dec 27. The EM712 data clearly show internal waves in the water column and the final mooring locations were chosen based on the hydroacoustic data. One mooring location is at the downslope boundary of a sediment wave field; the second mooring is located 2 waves further upslope. Both moorings are located inside the Agadir Slide scar. Dec 27 was an extremely busy day. Hydroacoustic surveying was continued until 07:00h. Some tracks needed to be adjusted due to fishing activities. Afterwards we took a CTD, a gravity corer and a giant box corer at both mooring locations. Moorings were deployed afterwards. The deployment went very smooth and was finished at 17:00h. We started a seismic survey at 18:00h. This survey aimed in connecting existing lines in the area of the headwall of the Agadir Slide to DSDP-site 415, which is located south of Agadir Canyon in about 2800 m water depth. The survey was interrupted for a short time due to a failure of one streamer segment but was quickly continued after the faulty section was identified. The survey was scheduled until Dec 29 at 07:00h. The planned track was modified slightly at the end of the survey because of longlines deployed on the track. Dec 29 was designated to coring the walls of Agadir Canyon. The aim was to core across a trim line of a turbidite but the trimline was not easy to identify in the new data. We decided to core across a linear morphological feature in the area where the Agadir Slide enters the Agadir Canyon. These cores (MSM113_55 and 56) are extremely interesting. Both contain a large number of turbidites and deposits of Agadir Slide at their base. Clear differences in the core will support the characterization of the flow behavior of the turbidity currents through Agadir Canyon. The night was used to survey potential coring locations in the head region of the Agadir Canyon. This region is probably the source area for very large

turbidites of the Moroccan turbidite system but no obvious head scarps are visible. We wanted to core several locations to investigate if we can correlate turbidite deposits in the head region with the distal deposits. Survey lines needed to be adjusted to several longlines. The first selected coring station was not accessible in the morning due to longlines. Hence, we started coring further north. In total, we collected four cores on terraces above the canyon (MSM113_58 - 61). All cores are long and mainly contain undisturbed background material. The last core taken from the location that was not accessible in the morning contained two turbidites, which we will correlate with the event layers in the Moroccan turbidite system. Coring was finished in the evening (22:00h) of Dec 30. Afterwards we started a long hydroacoustic survey. We followed Agadir Canyon to a location, where a prominent secondary canyon enters the main canyon. We followed this secondary canyon upslope to document morphological changes compared to a survey conducted during Cruise MSM32 in 2013. This survey was finished on Jan 1 at 09:00h.

We deployed the seismic gear at 16:00h after a short transit back to the area where the moorings were deployed. We repeated a short part of the line connecting the seismic grid to DSDP-site 415, as we had a small gap in the data acquired before. Afterwards we collected three lines across different parts of the sediment wave field. The seismic gear was retrieved at 08:00h on Jan 2. The day was used for coring. Three closely spaced locations (MSM113_64 – 66) across a single wave were cored with gravity and giant box corer. CTDs were collected at two of the stations. Hydroacoustic data of the upper continental slope west of the mooring stations were collected in the night. Some adjustments of the lines were again needed due to fishing activities. A single gravity core (MSM113_68) was taken around noon on Jan 3. This core was located upslope of a small slide scarp and we wanted to core the glide plane of this slide. Parasound data indicated a depth of 7m for the glide plane. Recovery was almost 9m; hence the core penetrated the glide plane. A last set of seismic profiles across the sediment wave field east of the mooring stations was collected in the night of Jan 4. The well known fishing activities led to some deviations from the planned profiles. A CTD transect across the mooring locations was acquired on Jan 5. Eight CTD casts were collected along a 15 nm long profile in water depths from 150 to 1500m. The transect was completed at 19:00h. Additional water column data were collected during the night. We triangulated the mooring locations in the early morning of Jan 5. The first mooring was released shortly before 08:00h and was already on deck around 09:00h. This mooring was located at a wave trough; a gravity and giant box core at the upslope wave crest were taken after recovery of the mooring. The second mooring was recovered before lunch. This mooring was further up on a wave crest. Corresponding cores at the wave trough were collected at this location. The final geological station was finished at 13:45h on Jan 5. Last hydroacoustic data in the Agadir Canyon area were collected during the night. We started our transit to Las Palmas on Jan 6 at 04:12h. We switched off all acoustic systems when entering the Spanish EEZ at 10:00h the same day. We arrived at Las Palmas pilot station at 08:00h on Jan 7.

Four people of the scientific crew disembarked the vessel in Las Palmas, while one scientist each from Kiel University, the Centro Oceanográfico de Málaga, and the Instituto Español de Oceanografía (Madrid) boarded the vessel. In addition, two marine mammal observers (MMO) embarked in Las Palmas following the request of the Spanish authorities. Unfortunately, one of the MMOs was tested Covid-19 positive and had to be replaced. Hence, the departure in Las Palmas was delayed until 17:00h the same day. We started our work off La Palma with a CTD on Jan 8 around 10:00h. Afterwards we surveyed the western flank of La Palma from ~1500m downwards; the upper part was surveyed earlier by Spanish colleagues. The start of the survey was delayed until early afternoon due to some problems with the multibeam system but everything worked very smoothly afterwards. Visual observations during surveying were done by Marine Mammals Observers during daytime. During nighttime, we reduced the power of the hydroacoustic systems

in order to stay beneath a threshold; otherwise, a PAM would have been required for the night. The survey was only interrupted for a short period in the late morning of Jan 11, when some dolphins were close to the vessel. We left the survey area at 14:00h on Jan 11, which was the end of the scientific program of Cruise MSM113. We arrived at the port of Las Palmas on Jan 12 at 13:30h. RV MARIA S. MERIAN Cruise MSM113 was a great success. We collected about 3500 nautical miles of hydroacoustic data including high-quality water column images clearly showing internal waves. Two times two moorings were deployed and retrieved again. CTD casts were collected at 32 stations. We collected about 1400 km high-resolution seismic profiles of excellent quality. Geological samples (31 gravity corers and 14 giant box corers) were taken at 34 stations. The new data will allow to reconstruct the development of sediment waves by integrating the geological/geophysical and oceanographic data.

Acknowledgements

The scientific party of RV MARIA S. MERIAN Cruise MSM113 gratefully acknowledges the very friendly and most effective cooperation with Captain Schmidt and his crew. Their great flexibility and their perfect technical assistance substantially contributed to make this cruise a scientific success. We also appreciate the valuable support by the Leitstelle Deutsche Forschungsschiffe (German Research Fleet Coordination Centre) at the University of Hamburg. The expedition was funded by the Deutsche Forschungsgemeinschaft.

List of Participants

Name	Discipline	Institution
Krastel, Sebastian, Prof.	Chief Scientist	CAU
Böttner-Elger, Christoph, Dr.	Co-Chief Scientist	CAU
Geersen, Jacob, Dr.	Hydroacoustics	CAU
Baumann, Lenya	Seismics/Hydroacoustics	CAU
Friedrich, Jenny	Seismics/Hydroacoustics	CAU
Pandolpho, Bruna	Seismics/Hydroacoustics	GEOMAR
Rollwage, Luisa	Seismics/Hydroacoustics	CAU
Sokolkova, Elisaveta	Seismics/Hydroacoustics	CAU
Thamm, Viktoria	Seismics/Hydroacoustics	CAU
¹ Schönke, Mischa, Dr.	Sedimentology	IOW
Ackermann, Alicia	Sedimentology	IOW
¹ Englert, Rebecca, Dr.	Sedimentology	UD
Groß, Kathrin	Sedimentology	CAU
Morgenweck, Lea	Sedimentology	CAU
Olbricht, Hannah	Moorings	GEOMAR
¹ Damke, Paula.	CTD/Moorings	GEOMAR
¹ Rupf, Franziska	CTD/Moorings	GEOMAR
Heinrich, Sven	Technician	CAU
Jaehmlich, Heiko	Technician	CAU
² Gross, Felix, Dr.	Hydroacoustic	CAU
² Sánchez Guillamón, Olga	Hydroacoustics	CSIC

² León Buendía, Ricardo	Hydroacoustics	IGME
² Borg, Justine	Marine Mammal Observer	SUBMON
² de Alves Gonçalves, Hugo Marcelo	Marine Mammal Observer	SUBMON

¹ Only Leg 1 (09.12.22 – 07.01.23)

² Only Leg 2 (07.01.23 – 12.01.23)

CAU	Christian-Albrechts-Universität zu Kiel, Germany
CSIC	Centro Oceanográfico de Málaga, Instituto Español de Oceanografía, Consejo Superior de Investigaciones Científicas, Spain
DU	Durham University, United Kingdom
GEOMAR	Helmholtz-Zentrum für Ozeanforschung Kiel, Germany
IGME	Instituto Geológico y Minero de España, Madrid, Spain
IOW	Leibniz-Institut für Ostseeforschung Warnemünde, Germany
SUBMON	SUBMON, Barcelona, Spain

Stationlist

Station	Date / Time UTC	Device	Latitude	Longitude	Depth (m)	Comment
MSM113_1-1	10.12.22 20:40	CTD	26° 50,691' N	015° 10,779' W	2905	including releaser test
MSM113_2-2	10.12.22 22:42	Parasound P70	26° 50,446' N	015° 10,911' W	2895	Start survey
MSM113_2-1	10.12.22 22:42	EM122 MBES	26° 50,446' N	015° 10,911' W	2895	start survey
MSM113_2-1	11.12.22 08:12	EM122 MBES	26° 24,199' N	015° 06,217' W	1281	end survey
MSM113_2-2	11.12.22 08:12	Parasound P70	26° 24,197' N	015° 06,219' W	1281	end survey
MSM113_3-1	11.12.22 08:57	CTD	26° 26,198' N	015° 09,527' W	1377	
MSM113_3-2	11.12.22 10:22	Mooring	26° 24,525' N	015° 10,822' W	1359	KPO1266 start deployment
MSM113_3-2	11.12.22 12:31	Mooring	26° 26,339' N	015° 09,461' W	1381	end deployment
MSM113_4-1	11.12.22 13:09	CTD	26° 23,051' N	015° 07,630' W	1148	
MSM113_4-2	11.12.22 14:24	Mooring	26° 21,536' N	015° 07,698' W	1070	KPO1267 start deployment
MSM113_4-2	11.12.22 15:34	Mooring	26° 23,080' N	015° 07,618' W	1148	end deployment
MSM113_5-2	11.12.22 15:53	Parasound P70	26° 24,282' N	015° 06,077' W	1287	start survey
MSM113_5-1	11.12.22 15:53	EM122 MBES	26° 24,282' N	015° 06,077' W	1287	start survey
MSM113_5-1	12.12.22 07:46	EM122 MBES	26° 23,633' N	015° 09,503' W	1225	end survey
MSM113_5-2	12.12.22 07:46	Parasound P70	26° 23,618' N	015° 09,514' W	1223	end survey
MSM113_6-1	12.12.22 09:28	Gravity Corer	26° 24,824' N	015° 08,655' W	1261	10m with SVP and USBL
MSM113_7-1	12.12.22 13:50	Seismic Towed	26° 16,013' N	014° 59,499' W	633	Beginn Pre-Watch
MSM113_7-1	12.12.22 14:38	Seismic Towed	26° 14,974' N	014° 59,815' W	590	soft start
MSM113_7-1	12.12.22 15:26	Seismic Towed	26° 15,495' N	015° 02,669' W	663	start survey
MSM113_7-1	14.12.22 06:29	Seismic Towed	26° 31,726' N	015° 00,381' W	1537	end survey
MSM113_8-1	14.12.22 08:10	Gravity Corer	26° 25,033' N	015° 11,541' W	1411	10m with USBL
MSM113_9-1	14.12.22 09:38	Gravity Corer	26° 25,678' N	015° 12,043' W	1487	10m with USBL
MSM113_10-1	14.12.22 10:53	CTD	26° 25,498' N	015° 11,887' W	1521	
MSM113_10-2	14.12.22 12:04	Gravity Corer	26° 25,497' N	015° 11,886' W	1523	5m with USBL
MSM113_10-3	14.12.22 13:32	Gravity Corer	26° 25,492' N	015° 11,894' W	1520	10m with USBL
MSM113_11-1	14.12.22 15:03	Gravity Corer	26° 25,258' N	015° 11,726' W	1526	10m with USBL
MSM113_12-2	14.12.22 16:37	Parasound P70	26° 26,781' N	015° 17,059' W	1783	start survey
MSM113_12-1	14.12.22 16:37	EM122 MBES	26° 26,781' N	015° 17,059' W	1783	start survey
MSM113_12-2	15.12.22 08:25	Parasound P70	26° 34,503' N	015° 21,476' W	2828	end survey
MSM113_12-1	15.12.22 08:25	EM122 MBES	26° 34,503' N	015° 21,476' W	2828	end survey
MSM113_13-1	15.12.22 08:31	CTD	26° 34,502' N	015° 21,477' W	2829	
MSM113_14-2	15.12.22 10:50	seismic towed	26° 31,313' N	015° 16,294' W	2364	Beginn Pre-Watch
MSM113_14-2	15.12.22 11:39	seismic towed	26° 29,972' N	015° 12,502' W	1933	soft start
MSM113_14-2	15.12.22 12:07	seismic towed	26° 30,309' N	015° 11,003' W	1826	start survey
MSM113_14-2	17.12.22 08:55	seismic towed	26° 37,084' N	014° 57,114' W	1824	end survey
MSM113_15-1	17.12.22 11:14	CTD	26° 21,373' N	015° 06,434' W	1055	
MSM113_15-2	17.12.22 12:07	Gravity Corer	26° 21,385' N	015° 06,435' W	1053	10m with USBL
MSM113_16-1	17.12.22 14:33	Gravity Corer	26° 17,048' N	015° 04,436' W	774	10m with USBL
MSM113_17-1	17.12.22 15:32	Gravity Corer	26° 16,729' N	015° 04,199' W	805	5m with USBL
MSM113_18-1	17.12.22 17:15	Seismic towed	26° 17,736' N	015° 09,116' W	1130	Beginn Pre-Watch
MSM113_18-1	17.12.22 18:24	Seismic towed	26° 26,718' N	015° 14,340' W	1866	soft start

Station	Date / Time UTC	Device	Latitude	Longitude	Depth (m)	Comment
MSM113_18-1	17.12.22 18:49	Seismic towed	26° 27,539' N	015° 13,347' W	1835	start survey
MSM113_18-1	18.12.22 12:14	Seismic towed	26° 41,094' N	015° 25,419' W	3088	end survey
MSM113_19-1	18.12.22 13:59	Gravity Corer	26° 36,861' N	015° 15,067' W	2801	5m with USBL
MSM113_20-1	18.12.22 15:52	Gravity Corer	26° 36,162' N	015° 16,968' W	2865	10m with USBL
MSM113_21-1	18.12.22 18:40	Gravity Corer	26° 40,216' N	015° 05,879' W	2759	10m with USBL
MSM113_22-2	18.12.22 22:00	Parasound P70	26° 36,504' N	015° 26,418' W	2967	start survey
MSM113_22-1	18.12.22 22:00	EM122 MBES	26° 36,504' N	015° 26,418' W	2967	start survey
MSM113_23-1	19.12.22 14:43	CTD	26° 09,468' N	016° 01,275' W	2809	
MSM113_22-1	20.12.22 11:20	EM122 MBES	26° 17,824' N	015° 06,407' W	863	end survey
MSM113_22-2	20.12.22 11:20	Parasound P70	26° 17,824' N	015° 06,407' W	863	end survey
MSM113_24-1	20.12.22 12:08	CTD	26° 16,493' N	015° 04,231' W	758	
MSM113_24-2	20.12.22 12:50	Box Corer	26° 16,493' N	015° 04,219' W	758	with USBL
MSM113_24-3	20.12.22 13:54	Box Corer	26° 16,484' N	015° 04,217' W	755	with USBL
MSM113_25-1	20.12.22 15:02	Box Corer	26° 16,730' N	015° 04,182' W	812	with USBL
MSM113_25-2	20.12.22 16:02	Box Corer	26° 16,730' N	015° 04,183' W	809	with USBL
MSM113_26-1	20.12.22 18:13	Box Corer	26° 25,260' N	015° 11,730' W	1508	with USBL
MSM113_27-1	20.12.22 21:00	CTD	26° 38,574' N	015° 17,372' W	2953	
MSM113_28-1	20.12.22 23:32	CTD	26° 34,844' N	015° 15,137' W	2782	
MSM113_29-1	21.12.22 01:51	CTD	26° 31,516' N	015° 12,891' W	2295	
MSM113_30-1	21.12.22 03:48	CTD	26° 28,323' N	015° 10,849' W	1669	
MSM113_31-1	21.12.22 05:28	CTD	26° 24,794' N	015° 08,533' W	1277	
MSM113_32-1	21.12.22 06:47	CTD	26° 22,143' N	015° 06,942' W	1125	
MSM113_33-1	21.12.22 08:01	CTD	26° 19,138' N	015° 05,854' W	897	
MSM113_34-1	21.12.22 09:26	CTD	26° 14,472' N	015° 02,540' W	610	
MSM113_35-1	21.12.22 12:35	Gravity Corer	26° 20,755' N	015° 16,633' W	1368	10 m with USBL
MSM113_36-1	21.12.22 15:43	Gravity Corer	26° 20,462' N	015° 17,105' W	1608	5m with USBL
MSM113_37-1	21.12.22 16:56	Gravity Corer	26° 20,363' N	015° 17,259' W	1586	5m with USBL
MSM113_38-1	21.12.22 18:46	EM712 MBES	26° 14,676' N	015° 22,616' W	1024	start survey
MSM113_38-1	22.12.22 04:57	EM712 MBES	26° 29,218' N	015° 10,170' W	1684	end survey
MSM113_4-2	22.12.22 08:11	Mooring	26° 22,807' N	015° 08,071' W	0	KPO1267 released
MSM113_4-2	22.12.22 09:41	Mooring	26° 23,000' N	015° 07,421' W	0	mooring on deck
MSM113_3-2	22.12.22 10:13	Mooring	26° 25,945' N	015° 09,940' W	0	KPO1266 released
MSM113_3-2	22.12.22 11:22	Mooring	26° 26,096' N	015° 09,214' W	1372	mooring on deck
MSM113_39-1	22.12.22 14:45	CTD	26° 22,192' N	014° 49,852' W	640	
MSM113_39-2	22.12.22 15:25	Box Corer	26° 22,213' N	014° 49,842' W	649	with USBL
MSM113_40-1	22.12.22 16:10	EM712 MBES	26° 22,214' N	014° 49,847' W	654	start survey
MSM113_41-1	22.12.22 17:13	XSV	26° 24,045' N	014° 57,441' W	1022	
MSM113_40-2	22.12.22 18:23	EM122 MBES	26° 20,270' N	015° 04,037' W	946	start survey
MSM113_40-3	22.12.22 18:23	Parasound P70	26° 20,269' N	015° 04,039' W	947	start survey
MSM113_40-1	23.12.22 05:38	EM712 MBES	26° 29,270' N	014° 42,677' W	742	end survey
MSM113_42-1	23.12.22 08:02	Box Corer	26° 23,029' N	015° 07,680' W	1154	with USBL
MSM113_42-2	23.12.22 09:08	Gravity Corer	26° 23,028' N	015° 07,680' W	1155	10m with USBL
MSM113_43-1	23.12.22 10:36	Gravity Corer	26° 26,157' N	015° 09,531' W	1372	10m with USBL

Station	Date / Time UTC	Device	Latitude	Longitude	Depth (m)	Comment
MSM113_43-2	23.12.22 11:34	Box Corer	26° 26,157' N	015° 09,531' W	1371	with USBL
MSM113_44-1	23.12.22 12:17	Seismic towed	26° 26,157' N	015° 09,531' W	1372	Beginn Pre-Watch
MSM113_44-1	23.12.22 13:36	Seismic towed	26° 30,567' N	015° 13,055' W	2145	soft start
MSM113_44-1	23.12.22 14:27	Seismic towed	26° 29,703' N	015° 11,049' W	1793	start survey
MSM113_44-1	24.12.22 08:37	Seismic towed	26° 16,830' N	015° 18,949' W	1113	end survey
MSM113_45-1	24.12.22 10:12	CTD	26° 27,146' N	015° 23,095' W	1975	
MSM113_46-1	24.12.22 14:42	XSV	26° 24,933' N	015° 08,710' W	1262	
MSM113_47-1	25.12.22 20:14	XSV	29° 18,336' N	011° 42,868' W	1416	
MSM113_48-1	25.12.22 20:15	EM712 MBES	29° 18,309' N	011° 42,828' W	1412	start survey
MSM113_48-1	26.12.22 06:30	EM712 MBES	29° 12,768' N	011° 45,090' W	1106	end survey
MSM113_48-2	26.12.22 06:31	EM122 MBES	29° 12,767' N	011° 45,179' W	1107	start survey
MSM113_48-3	26.12.22 06:31	Parasound P70	29° 12,763' N	011° 45,196' W	1106	start survey
MSM113_48-3	27.12.22 02:31	Parasound P70	29° 10,017' N	011° 42,346' W	968	end survey
MSM113_48-2	27.12.22 02:31	EM122 MBES	29° 10,017' N	011° 42,346' W	968	end survey
MSM113_48-4	27.12.22 02:31	EM712 MBES	29° 10,017' N	011° 42,346' W	968	start survey
MSM113_48-4	27.12.22 06:22	EM712 MBES	29° 10,938' N	011° 37,948' W	728	end survey
MSM113_49-1	27.12.22 06:45	CTD	29° 11,197' N	011° 37,798' W	747	
MSM113_49-2	27.12.22 07:43	Gravity Corer	29° 11,202' N	011° 37,789' W	746	10m with USBL
MSM113_49-3	27.12.22 08:46	Gravity Corer	29° 11,203' N	011° 37,790' W	746	10m with USBL
MSM113_49-4	27.12.22 09:35	Box Corer	29° 11,203' N	011° 37,790' W	746	with USBL
MSM113_50-1	27.12.22 10:59	CTD	29° 12,800' N	011° 39,047' W	1038	
MSM113_50-2	27.12.22 11:49	Box Corer	29° 12,795' N	011° 39,027' W	1038	with USBL
MSM113_50-3	27.12.22 12:53	Gravity Corer	29° 12,794' N	011° 39,028' W	1038	5m with USBL
MSM113_50-4	27.12.22 14:08	Mooring	29° 12,640' N	011° 41,104' W	970	KPO1268 start deployment
MSM113_50-4	27.12.22 15:27	Mooring	29° 12,844' N	011° 39,061' W	0	end deployment
MSM113_51-1	27.12.22 15:59	Mooring	29° 11,100' N	011° 39,103' W	898	KPO1269 start deployment
MSM113_52-1	27.12.22 16:00	Seismic towed	29° 11,103' N	011° 39,066' W	901	Beginn Pre-Watch
MSM113_51-1	27.12.22 16:49	Mooring	29° 11,226' N	011° 37,617' W	757	end deployment
MSM113_52-1	27.12.22 17:38	Seismic towed	29° 08,106' N	011° 42,832' W	625	soft start
MSM113_52-1	27.12.22 18:00	Seismic towed	29° 08,867' N	011° 41,712' W	888	start survey
MSM113_53-1	28.12.22 08:33	XSV	30° 02,650' N	011° 51,774' W	2133	
MSM113_54-1	28.12.22 08:49	XSV	30° 03,652' N	011° 51,459' W	2136	
MSM113_52-1	29.12.22 06:50	Seismic towed	30° 58,883' N	011° 19,574' W	2349	end survey
MSM113_55-1	29.12.22 13:01	Gravity Corer	30° 43,445' N	011° 27,569' W	2742	10m with USBL
MSM113_56-1	29.12.22 14:40	CTD	30° 43,684' N	011° 27,344' W	2755	
MSM113_56-2	29.12.22 16:22	Gravity Corer	30° 43,684' N	011° 27,344' W	2756	10m with USBL
MSM113_57-1	29.12.22 17:58	EM122 MBES	30° 43,675' N	011° 27,265' W	2759	start survey
MSM113_57-2	29.12.22 17:58	Parasound P70	30° 43,666' N	011° 27,238' W	2760	start survey
MSM113_57-2	30.12.22 08:19	Parasound P70	30° 28,042' N	010° 23,285' W	1488	end survey
MSM113_57-1	30.12.22 08:19	EM122 MBES	30° 28,027' N	010° 23,287' W	1487	end survey
MSM113_58-1	30.12.22 11:48	Gravity Corer	30° 44,923' N	010° 31,382' W	2181	10m with USBL
MSM113_59-1	30.12.22 14:50	Gravity Corer	30° 45,035' N	010° 36,434' W	1997	10m with USBL
MSM113_60-1	30.12.22 16:53	Gravity Corer	30° 40,073' N	010° 31,889' W	1699	10m with USBL

Station	Date / Time UTC	Device	Latitude	Longitude	Depth (m)	Comment
MSM113_61-1	30.12.22 20:52	Gravity Corer	30° 30,201' N	010° 22,905' W	1881	10m with USBL
MSM113_62-2	30.12.22 22:00	Parasound P70	30° 30,260' N	010° 23,227' W	1884	start survey
MSM113_62-1	30.12.22 22:00	EM122 MBES	30° 30,260' N	010° 23,227' W	1884	start survey
MSM113_62-1	01.01.23 08:35	EM122 MBES	30° 09,697' N	010° 40,357' W	1965	end survey
MSM113_62-2	01.01.23 08:35	Parasound P70	30° 09,697' N	010° 40,357' W	1965	end survey
MSM113_63-1	01.01.23 14:44	Seismic towed	29° 35,437' N	011° 40,584' W	1692	Beginn Pre-Watch
MSM113_63-1	01.01.23 15:55	Seismic towed	29° 30,213' N	011° 48,926' W	1698	soft start
MSM113_63-1	01.01.23 16:20	Seismic towed	29° 28,957' N	011° 49,069' W	1686	start survey
MSM113_63-1	02.01.23 08:08	Seismic towed	29° 01,569' N	011° 56,148' W	325	end survey
MSM113_64-1	02.01.23 10:20	CTD	29° 10,088' N	011° 40,760' W	712	
MSM113_64-2	02.01.23 11:12	Gravity Corer	29° 10,085' N	011° 40,762' W	711	10m with USBL
MSM113_64-3	02.01.23 11:53	Box Corer	29° 10,085' N	011° 40,762' W	713	with USBL
MSM113_65-1	02.01.23 12:51	Box Corer	29° 10,193' N	011° 40,889' W	754	with USBL
MSM113_65-2	02.01.23 13:40	Gravity Corer	29° 10,193' N	011° 40,890' W	755	10m with USBL
MSM113_66-1	02.01.23 14:29	CTD	29° 10,334' N	011° 41,043' W	787	
MSM113_66-2	02.01.23 15:10	Gravity Corer	29° 10,333' N	011° 41,043' W	787	10m with USBL
MSM113_66-3	02.01.23 15:55	Box Corer	29° 10,337' N	011° 41,043' W	787	with USBL
MSM113_67-1	02.01.23 17:16	EM712 MBES	29° 10,317' N	011° 37,124' W	584	start survey
MSM113_67-1	02.01.23 19:19	EM712 MBES	29° 05,724' N	011° 37,393' W	163	end survey
MSM113_67-2	02.01.23 19:19	EM122 MBES	29° 05,698' N	011° 37,406' W	164	start survey
MSM113_67-3	02.01.23 19:19	Parasound P70	29° 05,698' N	011° 37,406' W	164	start survey
MSM113_67-2	03.01.23 12:18	EM122 MBES	29° 08,676' N	011° 42,080' W	971	end survey
MSM113_67-3	03.01.23 12:18	Parasound P70	29° 08,676' N	011° 42,080' W	971	end survey
MSM113_68-1	03.01.23 13:12	Gravity Corer	29° 10,262' N	011° 35,986' W	527	10m
MSM113_69-1	03.01.23 13:54	EM712 MBES	29° 10,086' N	011° 36,946' W	0	start survey
MSM113_70-1	03.01.23 15:00	Seismic towed	29° 12,294' N	011° 42,448' W	989	start pre watch
MSM113_69-1	03.01.23 15:58	EM712 MBES	29° 06,134' N	011° 37,081' W	155	end survey
MSM113_70-1	03.01.23 16:44	Seismic towed	29° 05,166' N	011° 35,154' W	131	softstart
MSM113_70-1	03.01.23 17:12	Seismic towed	29° 06,452' N	011° 35,581' W	157	start survey
MSM113_70-1	04.01.23 08:10	Seismic towed	29° 17,416' N	011° 22,800' W	874	end survey
MSM113_71-1	04.01.23 10:17	CTD	29° 06,958' N	011° 34,487' W	154	
MSM113_72-1	04.01.23 11:36	CTD	29° 08,639' N	011° 35,741' W	368	
MSM113_73-1	04.01.23 12:28	CTD	29° 10,369' N	011° 37,041' W	593	
MSM113_74-1	04.01.23 13:24	CTD	29° 12,081' N	011° 38,326' W	955	
MSM113_75-1	04.01.23 14:29	CTD	29° 13,809' N	011° 39,586' W	1129	
MSM113_76-1	04.01.23 15:39	CTD	29° 15,450' N	011° 40,848' W	1287	
MSM113_77-1	04.01.23 16:58	CTD	29° 17,149' N	011° 42,234' W	1365	
MSM113_78-1	04.01.23 18:17	CTD	29° 18,835' N	011° 43,653' W	1458	
MSM113_79-1	04.01.23 19:33	EM712 MBES	29° 18,716' N	011° 43,546' W	1453	start survey
MSM113_79-1	05.01.23 03:59	EM712 MBES	29° 06,369' N	011° 34,943' W	146	end survey
MSM113_50-4	05.01.23 07:55	Mooring	29° 12,547' N	011° 39,386' W	959	KPO1268 released
MSM113_50-4	05.01.23 09:04	Mooring	29° 13,258' N	011° 38,826' W	1050	on deck
MSM113_80-1	05.01.23 09:31	Gravity Corer	29° 12,365' N	011° 38,702' W	963	10m with USBL

Station	Date / Time UTC	Device	Latitude	Longitude	Depth (m)	Comment
MSM113_80-2	05.01.23 10:19	Box Corer	29° 12,363' N	011° 38,704' W	963	with USBL
MSM113_51-1	05.01.23 11:06	Mooring	29° 12,349' N	011° 38,737' W	961	KPO1269 released
MSM113_51-1	05.01.23 12:03	Mooring	29° 11,451' N	011° 37,894' W	838	on deck
MSM113_81-1	05.01.23 12:22	Box Corer	29° 11,446' N	011° 38,000' W	833	with USBL
MSM113_81-2	05.01.23 13:23	Gravity Corer	29° 11,445' N	011° 38,005' W	833	10m with USBL
MSM113_82-1	05.01.23 14:55	EM712 MBES	29° 17,127' N	011° 42,311' W	1364	start survey
MSM113_82-1	05.01.23 16:29	EM712 MBES	29° 06,737' N	011° 34,372' W	147	end survey
MSM113_82-2	05.01.23 16:30	EM122 MBES	29° 06,673' N	011° 34,230' W	292	start survey
MSM113_82-3	05.01.23 16:30	Parasound P70	29° 06,666' N	011° 34,160' W	145	start survey
MSM113_82-3	06.01.23 04:12	Parasound P70	29° 26,272' N	010° 55,569' W	1017	end survey
MSM113_82-2	06.01.23 04:12	EM122 MBES	29° 26,289' N	010° 55,566' W	1010	end survey
MSM113_83-1	08.01.23 09:42	CTD	28° 16,758' N	017° 41,786' W	1709	
MSM113_84-1	08.01.23 11:30	Parasound P70	28° 16,758' N	017° 41,785' W	0	start survey
MSM113_84-2	08.01.23 15:42	EM122 MBES	28° 21,448' N	017° 49,194' W	936	start survey
MSM113_85-1	09.01.23 08:31	XSV	28° 18,475' N	017° 58,547' W	3242	
MSM113_86-1	10.01.23 11:12	XSV	28° 44,478' N	018° 24,930' W	3883	
MSM113_84-2	11.01.23 14:00	EM122 MBES	28° 25,113' N	017° 50,894' W	956	end survey
MSM113_84-1	11.01.23 14:00	Parasound P70	28° 25,113' N	017° 50,894' W	956	end survey

List of seismic profiles

Profile -Nr.	Date Start	Time Start UTC	Date End	Time End UTC	Latitude Start (North)	Longitude Start (West)	Latitude End (North)	Longitude End (West)	FFN Start	FFN End
P101	12.12.22	15:26	12.12.22	20:30	26°15.50	015°02.68	26°33.03	015°13.85	1344	4988
P201	12.12.22	20:35	12.12.22	23:43	26°33.32	015°14.02	26°44.22	015°20.98	5000	6896
P202	12.12.22	23:48	13.12.22	03:25	26°44.59	015°20.80	26°52.40	015°07.15	6951	9124
P203	13.12.22	03:33	14.12.22	06:00	26°52.20	015°06.69	26° 42.87	015°02.89	9205	10690
P301	13.12.22	08:00	13.12.22	08:36	26°44.01	015°03.34	26°41.61	015°02.38	11041	11347?
P401	13.12.22	08:40	13.12.22	13:43	26°41.41	015°02.31	26°22.34	014°51.93	12000	15657
P501	13.12.22	16:07	13.12.22	23:26	26°24.36	014°57.68	26°48.19	015°16.56	16000	20390
P502	13.12.22	23:34	14.12.22	00:50	26°48.64	015°16.41	26°51.45	015°11.73	20473	21229
P503	14.12.22	00:58	14.12.22	06:30	26°51.37	015°11.23	26°31.68	015°00.35	21311	24629
P601	15.12.22	12:07	15.12.22	14:33	26°30.30	015°10.99	26°21.80	015°05.71	25212	26958
P602	15.12.22	14:50	15.12.22	17:10	26°21.44	015°06.50	26°29.61	015°11.64	27168	28859
P603	15.12.22	17:27	15.12.22	19:45	26°29.88	015°10.91	26°21.78	015°05.82	29040	30712
P604	15.12.22	20:01	15.12.22	22:22	26°21.38	015°06.61	26°29.57	015°11.75	30889	32589
P605	15.12.22	22:37	16.12.22	00:56	26°29.85	015°11.01	26°21.75	015°05.93	32769	34438
P606	16.12.22	01:15	16.12.22	03:35	26°21.32	015°06.69	26°29.49	015°11.82	34656	36339
P607	16.12.22	03:52	16.12.22	06:10	26°29.83	015°11.13	26°21.69	015°05.98	36538	38215
P608	16.12.22	06:28	16.12.22	08:48	26°21.31	015°06.81	26°29.43	015°11.99	38416	40090
P609	16.12.22	09:04	16.12.22	11:24	26°29.73	015°11.19	26°21.53	015°06.07	40281	41972
P610	16.12.22	11:40	16.12.22	13:59	26°21.25	015°06.90	26°29.41	015°12.03	42154	43834
P611	16.12.22	14:17	16.12.22	16:37	26°29.69	015°11.29	26°21.59	015°06.21	44038	45707
P612	16.12.22	16:54	16.12.22	19:08	26°21.22	015°07.00	26°29.34	015°12.12	45929	47540
P613	16.12.22	19:23	16.12.22	21:37	26°29.67	015°11.40	26°21.50	015°26.28	47719	49327
P614	16.12.22	21:54	17.12.22	00:08	26°21.17	015°21.18	26°29.41	015°12.27	49522	51136
P615	17.12.22	00:23	17.12.22	02:41	26°29.60	015°11.49	26°21.48	015°06.40	51312	52969
P616	17.12.22	02:59	17.12.22	05:10	26°21.10	015°07.20	26°28.91	015°12.07	53183	54758
P617	17.12.22	05:15	17.12.22	08:55	26°29.23	015°11.83	26°37.09	014°57.08	54823	57454
P701	17.12.22	18:48	17.12.22	21:56	26°27.49	015°13.35	26°37.05	015°23.24	58000	59868
P702	17.12.22	22:03	18.12.22	04:47	26°37.46	015°23.00	26°51.68	014°55.78	59941	64076
P703	18.12.22	04:56	18.12.22	05:33	26°51.68	014°55.78	26°53.84	014°57.98	64076	64452
P704	18.12.22	05:43	18.12.22	12:13	26°53.83	014°58.14	26°41.09	015°25.43	64545	68451
P801	23.12.22	14:27	23.12.22	18:16	26°29.68	015°11.07	26°21.58	015°25.59	69346	72107
P802	23.12.22	18:26	23.12.22	19:17	26°21.03	015°25.63	26°17.95	015°23.97	72220	72835
P803	23.12.22	19:25	24.12.22	01:49	26°17.92	015°23.48	26°33.38	014°57.95	72920	77532
P804	24.12.22	01:57	24.12.22	02:41	26°33.22	014°57.46	26°30.44	014°55.62	77623	78155
P805	24.12.22	02:49	24.12.22	08:36	26°29.96	014°55.78	26°16.86	015°18.89	78252	82414
P901	27.12.22	18:25	27.12.22	22:36	29°10.09	011°40.67	29°26.26	011°48.02	83305	86093
P1000	27.12.22	22:40	27.12.22	22:55	29°26.48	011°48.12			87000	87135
P1101	27.12.22	22:57	28.12.22	02:44	29°27.52	011°48.60	29°40.11	011°58.23	88000	90615
P1102	28.12.22	02:49	28.12.22	15:54	29°40.40	011°58.30	30°30.91	011°42.49	90678	100100
P1103	28.12.22	16:00	28.12.22	18:39	30°31.20	011°42.23	30°38.39	011°33.10	100171	102075
P1201	28.12.22	18:44	28.12.22	21:12	30°38.64	011°32.86	30°45.59	011°41.26	103000	104483
P1202	28.12.22	21:17	29.12.22	00:51	30°45.89	011°41.41	31°00.09	011°43.33	104532	106673
P1203	29.12.22	00:58	29.12.22	04:16	31°00.48	011°43.09	31°05.10	011°28.71	106744	108726
P1204	29.12.22	04:16	29.12.22	06:48	31°05.10	011°28.71	31°58.93	011°19.64	108726	110239
P1301	01.01.23	16:11	01.01.23	20:12	29°29.49	011°48.98	29°15.11	011°47.61	111000	113886
P1302	01.01.23	20:18	01.01.23	23:04	29°14.75	011°47.64	29°04.38	011°43.26	113954	115944
P1303	01.01.23	23:12	02.01.23	00:23	29°03.99	011°43.39	29°01.30	011°48.02	116031	116889
P1304	02.01.23	00:31	02.01.23	04:09	29°01.37	011°48.55	29°15.11	011°53.76	116998	119603

P1305	02.01.23	04:16	02.01.23	04:41	29°15.33	011°54.21	29°15.19	011°56.27	119684	119991
P1306	02.01.23	04:50	02.01.23	08:08	29°14.79	011°56.53	29°01.56	011°56.14	119991	122466
P1401	03.01.23	17:03	03.01.23	19:44	29°05.69	011°35.22	29°14.87	011°41.86	123000	124941
P1402	03.01.23	19:53	03.01.23	21:30	29°15.339	011°41.614	29°18.52	011°35.05	125056	126211
P1403	03.01.23	21:39	04.01.23	00:37	29°18.29	011°34.55	29°08.12	011°27.25	126329	128474
P1404	04.01.23	00:44	04.01.23	01:02	29°07.97	011°26.88	29°08.17	011°25.55	128548	128772
P1405	04.01.23	01:11	04.01.23	04:11	29°08.59	011°25.25	29°19.00	011°31.16	128870	131017
P1406	04.01.23	04:26	04.01.23	04:50	29°19.75	011°30.99	29°20.46	011°29.30	131193	131492
P1407	04.01.23	05:00	04.01.23	06:46	29°20.16	011°28.70	29°13.09	011°24.89	131604	132871
P1408	04.01.23	06:56	04.01.23	07:27	29°13.86	011°24.32	29°14.70	011°22.15	132993	133367
P1409	04.01.23	07:34	04.01.23	08:10	29°15.13	011°21.96	29°17.48	011°22.83	133458	133890