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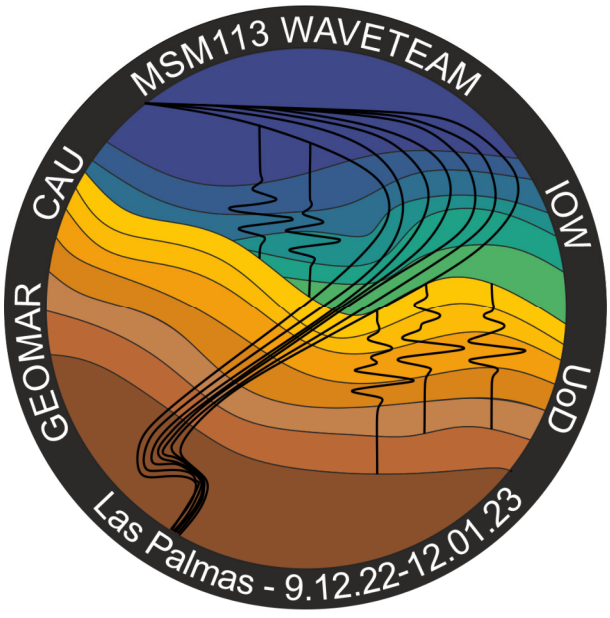
# Short Cruise Report
# RV Maria S. Merian-Cruise MSM113

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



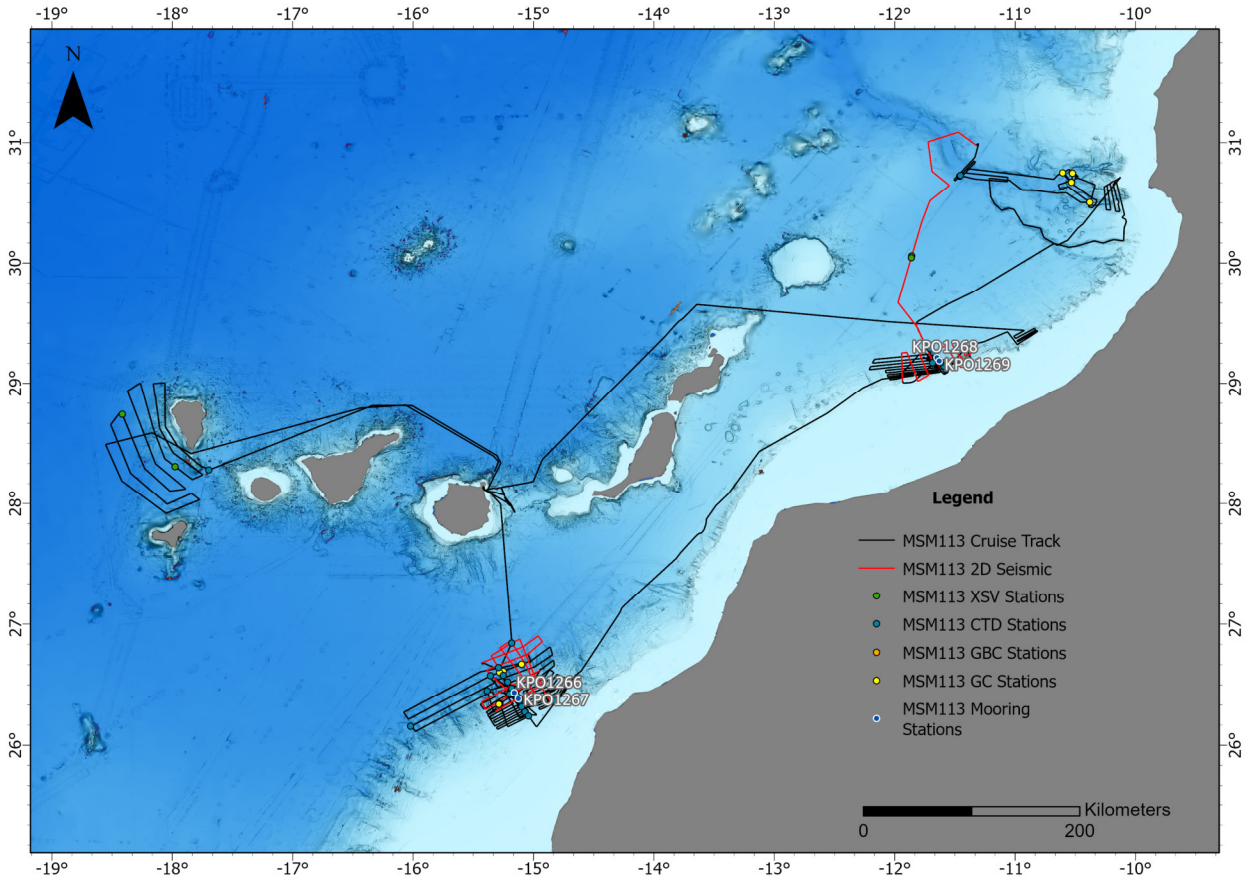



Fig 1: Track chart of Cruise MSM113 (Las Palmas – Las Palmas).

***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 ware 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 plain 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 Oceanografia (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.

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## List of Participants

| Name | Discipline | Institution |
|---|---|---|
| Krastel, Sebastian, Prof. | Chief Scientist | CAU |
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| Morgenweck, Lea | Sedimentology | CAU |
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| [1]Rupf, Franziska | CTD/Moorings | GEOMAR |
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|---|---|---|
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[1] Only Leg 1 (09.12.22 – 07.01.23)
[2] Only Leg 2 (07.01.23 – 12.01.23)

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|---|---|
| CAU | Christian-Albrechts-Universität zu Kiel, Germany |
| CSIC | Centro Oceanográfico de Málaga, Instituto Español de Oceanografia, Consejo Superior de Investigaciones Cientificas, Spain |
| DU | Durhamn 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 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **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 |