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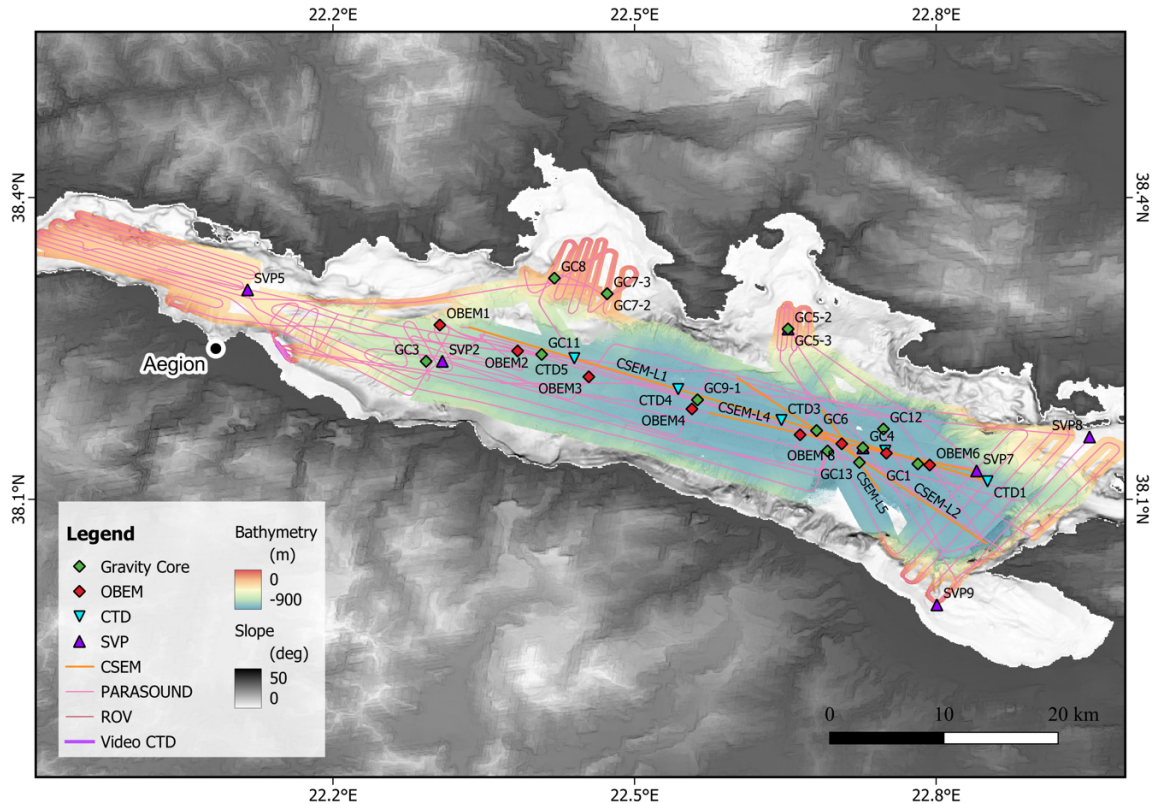
## Short Cruise Report RV Meteor, M196

Piräus, Greece – Limassol, Cyprus

5.12.2023 – 27.12.2023

Chief Scientist: Dr. Marion Jegen-Kulcsar

Captain: Derk Apetz



Overview of M196 stations. Bathymetric data acquired on M196 is shown as color map, cruise track as orange lines.

## Objectives

*The quality of groundwater is deteriorating globally, leading to an increase of pressure on water resources, particularly in coastal regions. In the quest for mitigating water scarcity under changing climatic conditions, alternative water sources such as offshore freshened groundwater (OFG) have come into scientific focus. Estimates suggest that globally the fresh water volume within OFGs amounts to half a million cubic kilometres. This volume corresponds to one century's worth of freshened water assuming present-day consumption rates.*

*Although OFGs are considered to be a global phenomenon, spatial dimensions, volumes, and geological controls of freshened water beneath the seafloor are poorly constrained, since discoveries are based mainly on chance findings in boreholes. Few studies exist that effectively combine the point-scale ground-truthing data through boreholes with regional measurements to adequately constrain the spatial extents of OFG. Moreover, questions regarding OFG connectivity to its terrestrial counterpart remain largely unanswered.*

*On this cruise we investigated a newly-discovered OFG site within the Gulf of Corinth, Greece. We acquired electromagnetic and geochemical data to derive the spatial extent of the Gulf of Corinth OFG, and to understand if this low-salinity anomaly is due to present-day recharge through an onshore aquifer system or, alternatively, a remnant of past sea-level lowstands.*

*The scientific programme has been designed to achieve the following objectives after analysis of the data:*

***O1: Characterize the spatial extent of OFG in the Gulf of Corinth using geophysical tools and integrate these with in-situ data from IODP boreholes.***

***O2: Characterize the seafloor groundwater discharge locations using CSEM data and geochemical data. Determine the origin of the water and deduce how / whether SGD is linked to the onshore aquifers.***

***O3: Characterize seeping groundwater and porewater to correlate with geophysical data and to indicate different origins of water and secondary water/sediment interaction.***

## Narrative

We entered the Gulf of Corinth (GoC) on the evening of December 6th, on the second day of our cruise. We immediately started testing the releaser systems, crucial components responsible for attaching the anchors of our ocean floor electromagnetic receivers (OBEMs) securely to the seafloor. Subsequently, we conducted a sound velocity profile, essential for the further processing of bathymetric data and navigation purposes.

As the morning of day 3 arrived, we commenced our gravity coring program. The first gravity core was successfully recovered near the IODP borehole in the eastern region of the GoC. These gravity cores will undergo analysis and stratigraphic analysis. Additionally, the porewater extracted from the cores will be analyzed for its chemical composition and salinity, aiming to provide insights into the provenance of fresh water in the seafloor sediments—a phenomenon previously identified during an IODP drilling expedition six years ago in the eastern section of the GoC.

We then started the electromagnetic program. Acquiring electromagnetic data enables the derivation of an electrical resistivity model of the seafloor. Since the bulk electrical resistivity of the seafloor in turn is directly linked to the electrical conductivity, i.e., salinity, of the pore water, electromagnetics is the method of choice to identify and explore the extent of seafloor groundwater occurrences. Our first step in the electromagnetic program was the deployment of 6 OBEMs spaced approximately 5 nautical miles apart along the entire central axis of the GoC. These OBEMs, equipped to record horizontal electric fields and three-component magnetic fields at 100 Hz, serve a dual purpose. They not only capture induced currents in the seafloor resulting from natural magnetic field variations but also record high-frequency electromagnetic waves if the seafloor-controlled source electromagnetic transmitter is within about 0.5 nautical miles.

During the night, we calibrated the Posidonia navigation system, a crucial step to ensure accurate navigation on the seafloor. The fourth day began with another gravity core, this time in the western section. Later in the evening, we deployed our seafloor towed controlled source EM system (CSEM). The 800 m long seafloor towed system consists of a heavy sled at its head, which houses the electromagnetic transmitter electronics, which generates a 10 A half duty cycle current in a 100 m dipole attached and towed behind the sled. A string of 4 receiver dipoles attached to the transmitter dipole records the transmitted waves after they travelled through the seafloor. The system was towed from east to west, covering approximately 30 nautical miles along the central region of the GoC in order to map the extent of the freshened groundwater in the region. It was successfully recovered on day 5. A subsequent gravity core in the vicinity of the IODP borehole showed the first pore water salinity decrease with depth. During the night we started the acquisition of hydro-acoustic data in the eastern part of the GoC, which up to now has not been mapped at high resolution.

The subsequent day began with the retrieval of gravity cores in the morning. The remainder of the day was dedicated to acquiring conductivity, temperature depth profiles along our Controlled Source Electromagnetic (CSEM) line 1. This step was crucial for checking electrical conductivity variations within the water column, as they could potentially impact the evaluation of electromagnetic data. During the night, our focus shifted to acquiring bathymetric data to pinpoint suitable core locations in the Itea Bay area. Following this, we conducted gravity coring west of the Integrated Ocean Drilling Program (IODP) site.

In the late afternoon, we initiated a second CSEM survey (CSEM 2), which concluded on the 8th day of the survey. Unfortunately, no usable data was recorded due to a likely encounter with a seafloor obstacle early in the line. The increased tension in the wire caused the dipole cables to become snagged. The night was then dedicated to hydroacoustic mapping of the western section of the Gulf of Corinth (GoC), where high-resolution data was lacking.

After morning coring on the 9th day, the scientific team and crew enjoyed a pleasant evening celebrating the mid-term of the cruise with a barbecue on deck. Simultaneously, hydroacoustic data was acquired in the center of the GoC basin to identify suitable future gravity locations.

On the 10th day, our efforts to recover the western four OBEMs for redeployment around the IODP site for a high resolution survey faced challenges. One station (OBEM 4) was missing, and another (OBEM 2) had shifted into a position where the anchor could not release. This was attributed to interference from fishers with dredge nets. Indeed, a fisher reported recovering one of our stations the following morning while we were acquiring gravity cores along the central axis of the GoC.

After completing a hydroacoustic survey in the west overnight, the first Video Conductivity-Temperature-Depth (CTD) tracks were obtained in the southwestern shore of the GoC. Here, new fresh water seeps were discovered and sampled, alongside observations of altered flora and fauna. These seeps were further investigated with a mini-Remotely Operated Vehicle (ROV) on the morning of the 13th day at sea.

Moving to the eastern section, we met the fisher who had recovered our OBEM station. The night was spent acquiring densely sampled CSEM data on Line 4 crossing the IODP boreholes for calibration purposes. After retrieving the streamer on the morning of the 14th day, two gravity cores were recovered south and north of the IODP holes. Subsequently, we successfully recovered the remaining four OBEMs on the seafloor. One of these OBEMs had been dredged away by fishers, as it resurfaced 3 nautical miles away from its deployment location. While attempting to recover the OBEM that had not released previously using video and a hook, we received a call from our fisher friend reporting that he had seen the system at the water surface 5 miles west of our location. It appeared to have been dredged again by a fisher's net. Our scientific data acquisition concluded at 12:00 UTC on December 21st after another successful mini-ROV dive in the seepage area in the south western shore of the GoC.



*Analysis of gravity cores (left) and deployment of head of CSEM streamer (right)..*



*Deployment of gravity core (left) and OBEM (right).*



*Group photo of scientific crew M196.*

### **Acknowledgements**

We thank captain Derk Apetz of R/V Meteor and his crew for relentless support throughout the entire cruise and the collegial and constructive working atmosphere. Particular thanks go to our partners at the University of Malta, our Greek collaboration partners of HMCR, University of Patras and Dr. Katrin Schwalenberg of the Federal German Institute for Geosciences and Natural Resources. We like to thank the Greek Ministry of Foreign Affairs for granting work permits and the German embassy in Athens for their support and visit to the vessel. The cruise would not have been possible without financial support by the Helmholtz Association for the SMART project through the Helmholtz European Partnering program.

## Teilnehmerliste

1. Dr. Marion Jegen-Kulcsar	Fahrtleiter / <i>Chief Scientist</i>	GEOMAR
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3. Dr. Thomas Müller	PI Geochemistry	GEOMAR
4. Dr. Dimitris Sakellariou	PI Geology	HCMR
5. Dr. Dionisis Patiris	Physicist	HCMR
6. Dr. Mark Schmidt	Geochemistry	GEOMAR
7. Bruna Pandolpho	Acoustics	GEOMAR
8. Dr. Dimitrios Dimitrios	Geologist	UofP
9. Dr. Ariel Thomas	Electromagnetics	UofM
10. Dr. Monica Bucci	Electromagnetics	UofM
11. Dr. Senay Horozal	Electromagnetics	UofM
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13. Dr. Katrin Schwalenberg	Electromagnetics	BGR
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22. Martin Wollatz-Vogt	Technician	GEOMAR
23. Sergiy Cherednichenko	Technician	GEOMAR
24. Jan Fleer	Technician	GEOMAR
25. Jannis Usinger	Technician	GEOMAR
26. Hannes Schuler	Filmemacher	

## Institute

GEOMAR:	Helmholtz Centre for Ocean Research Kiel
UofH:	University of Hawaii
HCMR:	Hellenic Centre for Marine Research
UofM:	University of Malta
BGR:	Federal German Institute for Geosciences and Natural Resources
ETH:	Swiss Federal Institute of Technology Zurich
UofP:	University of Patras

## Stationsliste

Station	Date	Device	Time UTC	Action	Latitude N	Longitude E	Depth (m)	Comment
M196_1-1	06/12/2023	Sound Velocity Profiler	20:10	in the water	38° 14,971'	022° 22,674'	0	
M196_1-1	06/12/2023	Sound Velocity Profiler	20:28	max depth/on ground	38° 14,970'	022° 22,675'	0	SLmax = 700m
M196_1-1	06/12/2023	Sound Velocity Profiler	21:31	on deck	38° 14,971'	022° 22,678'	0	
M196_2-1	06/12/2023	Ocean bottom electromagnetic receiver	23:20	in the water	38° 14,973'	022° 22,676'	0	W10, Posidonia Kalibrierung mit OBEM
M196_2-1	06/12/2023	Ocean bottom electromagnetic receiver	23:30	information	38° 14,973'	022° 22,676'	0	Posidonia zu Wasser
M196_2-1	06/12/2023	Ocean bottom electromagnetic receiver	23:55	max depth/on ground	38° 14,973'	022° 22,676'	0	SLmax = 100m
M196_2-1	07/12/2023	Ocean bottom electromagnetic receiver	00:18	on deck	38° 14,973'	022° 22,676'	0	OBEM wieder an Deck, Test abgebrochen
M196_3-1	07/12/2023	Deep-sea Multibeam Echosounder	01:25	profile start	38° 16,382'	022° 18,440'	621	
M196_3-1	07/12/2023	Deep-sea Multibeam Echosounder	06:03	profile end	38° 06,681'	022° 51,827'	808	
M196_3-2	07/12/2023	Shallow-water Multibeam Echosounder	01:25	profile start	38° 16,377'	022° 18,448'	625	
M196_3-2	07/12/2023	Shallow-water Multibeam Echosounder	06:03	profile end	38° 06,679'	022° 51,837'	807	
M196_3-3	07/12/2023	P-70 Parasound	01:54	profile start	38° 15,328'	022° 22,081'	761	
M196_3-3	07/12/2023	P-70 Parasound	06:03	profile end	38° 06,677'	022° 51,855'	808	
M196_4-1	07/12/2023	Sound Velocity Profiler	07:20	in the water	38° 09,085'	022° 43,646'	845	W11
M196_4-1	07/12/2023	Sound Velocity Profiler	07:39	max depth/on ground	38° 09,086'	022° 43,648'	841	SLmax = 750m, SZmax = 15,0kN
M196_4-1	07/12/2023	Sound Velocity Profiler	07:58	on deck	38° 09,087'	022° 43,648'	844	
M196_5-1	07/12/2023	Gravity Corer	08:53	in the water	38° 08,110'	022° 46,908'	862	W11
M196_5-1	07/12/2023	Gravity Corer	09:14	max depth/on ground	38° 08,112'	022° 46,911'	0	SLmax = 864m, SZmax = 40,5kN
M196_5-1	07/12/2023	Gravity Corer	09:37	on deck	38° 08,110'	022° 46,908'	857	
M196_6-1	07/12/2023	Ocean bottom electromagnetic receiver	12:27	in the water	38° 08,048'	022° 47,618'	864	W11, OBEM 6

M196 6-1	07/12/2023	Ocean bottom electromagnetic receiver	13:08	max depth/on ground	38° 08,049'	022° 47,618'	0	SLmax = 800,6 m
M196 6-1	07/12/2023	Ocean bottom electromagnetic receiver	13:26	on deck	38° 08,049'	022° 47,618'	0	
M196 7-1	07/12/2023	Ocean bottom electromagnetic receiver	14:42	in the water	38° 09,852'	022° 39,883'	861	W11, OBEM 5
M196 7-1	07/12/2023	Ocean bottom electromagnetic receiver	15:14	max depth/on ground	38° 09,852'	022° 39,883'	862	SLmax = 800m, released
M196 7-1	07/12/2023	Ocean bottom electromagnetic receiver	15:31	on deck	38° 09,853'	022° 39,884'	861	
M196 8-1	07/12/2023	Ocean bottom electromagnetic receiver	16:35	in the water	38° 11,386'	022° 33,432'	865	W11, OBEM 4
M196 8-1	07/12/2023	Ocean bottom electromagnetic receiver	17:07	max depth/on ground	38° 11,398'	022° 33,382'	865	W11, released
M196 8-1	07/12/2023	Ocean bottom electromagnetic receiver	17:28	on deck	38° 11,399'	022° 33,384'	863	Releaser geöffnet, OBEM verhakt und wieder bis zur Oberfläche gehievt, OBEM an Oberfläche auf Tiefe gegangen
M196 9-1	07/12/2023	Ocean bottom electromagnetic receiver	18:36	in the water	38° 13,308'	022° 27,270'	827	
M196 10-1	07/12/2023	Ocean bottom electromagnetic receiver	19:47	in the water	38° 14,850'	022° 23,023'	798	
M196 11-1	07/12/2023	Ocean bottom electromagnetic receiver	20:14	in the water	38° 14,972'	022° 22,675'	795	
M196 11-1	07/12/2023	Ocean bottom electromagnetic receiver	20:44	max depth/on ground	38° 14,976'	022° 22,677'	794	SLmax = 750m, SZmax = 11,4kN
M196 11-1	07/12/2023	Ocean bottom electromagnetic receiver	21:51	information	38° 14,970'	022° 22,707'	0	Beginn Kalibrierung
M196 11-1	08/12/2023	Ocean bottom electromagnetic receiver	05:05	information	38° 14,718'	022° 23,136'	791	released
M196 11-1	08/12/2023	Ocean bottom electromagnetic receiver	05:34	on deck	38° 14,932'	022° 22,787'	0	
M196 12-1	08/12/2023	Deep-sea Multibeam Echosounder	00:52	profile start	38° 14,848'	022° 16,323'	698	
M196 12-1	08/12/2023	Deep-sea Multibeam Echosounder	04:20	profile end	38° 15,363'	022° 21,208'	754	
M196 12-2	08/12/2023	Shallow-water Multibeam Echosounder	00:52	profile start	38° 14,842'	022° 16,340'	698	
M196 12-2	08/12/2023	Shallow-water Multibeam Echosounder	04:00	profile end	38° 14,808'	022° 21,950'	782	
M196 12-3	08/12/2023	P-70 Parasound	00:52	profile start	38° 14,831'	022° 16,369'	698	
M196 12-3	08/12/2023	P-70 Parasound	04:20	profile end	38° 15,370'	022° 21,203'	753	
M196 13-1	08/12/2023	Ocean bottom electromagnetic receiver	07:37	in the water	38° 16,399'	022° 18,377'	630	
M196 14-1	08/12/2023	Sound Velocity	08:29	in the water	38°	022° 18,530'	732	W11



		Profiler			14,236'			
M196 14-1	08/12/2023	Sound Velocity Profiler	08:49	max depth/on ground	38° 14,235'	022° 18,529'	732	
M196 14-1	08/12/2023	Sound Velocity Profiler	09:06	on deck	38° 14,235'	022° 18,529'	732	
M196 14-2	08/12/2023	Gravity Corer	09:23	in the water	38° 14,235'	022° 18,529'	733	
M196 14-2	08/12/2023	Gravity Corer	09:37	max depth/on ground	38° 14,235'	022° 18,529'	732	
M196 14-2	08/12/2023	Gravity Corer	09:56	on deck	38° 14,234'	022° 18,529'	732	
M196 14-3	08/12/2023	Gravity Corer	10:27	in the water	38° 14,235'	022° 18,565'	734	W11
M196 14-3	08/12/2023	Gravity Corer	10:42	max depth/on ground	38° 14,233'	022° 18,561'	733	SLmax = 737m, SZmax = 39,6kN
M196 14-3	08/12/2023	Gravity Corer	11:00	on deck	38° 14,235'	022° 18,561'	732	
M196 15-1	08/12/2023	Controlled Source Electromagnetics	15:52	in the water	38° 06,594'	022° 52,742'	786	Kettenvorlauf
M196 15-1	08/12/2023	Controlled Source Electromagnetics	15:52	in the water	38° 06,601'	022° 52,712'	791	Receiver 4
M196 15-1	08/12/2023	Controlled Source Electromagnetics	16:22	in the water	38° 06,744'	022° 52,097'	0	Receiver 3
M196 15-1	08/12/2023	Controlled Source Electromagnetics	16:41	in the water	38° 06,842'	022° 51,860'	0	Receiver 2
M196 15-1	08/12/2023	Controlled Source Electromagnetics	17:06	in the water	38° 06,948'	022° 51,472'	0	Receiver 1
M196 15-1	08/12/2023	Controlled Source Electromagnetics	17:22	in the water	38° 07,026'	022° 51,235'	0	Elektrode 1
M196 15-1	08/12/2023	Controlled Source Electromagnetics	17:34	in the water	38° 07,081'	022° 51,081'	0	Elektrode 2
M196 15-1	08/12/2023	Controlled Source Electromagnetics	18:02	in the water	38° 07,176'	022° 50,720'	0	Schwein
M196 15-1	08/12/2023	Controlled Source Electromagnetics	19:30	profile start	38° 07,404'	022° 49,979'	0	
M196 15-1	10/12/2023	Controlled Source Electromagnetics	04:31	profile end	38° 16,034'	022° 21,076'	0	
M196 15-1	10/12/2023	Controlled Source Electromagnetics	06:18	on deck	38° 16,466'	022° 19,580'	0	Schwein
M196 15-1	10/12/2023	Controlled Source Electromagnetics	06:35	on deck	38° 16,532'	022° 19,346'	0	Elektronde 2
M196 15-1	10/12/2023	Controlled Source Electromagnetics	06:48	on deck	38° 16,584'	022° 19,169'	0	Elektrode 1
M196 15-1	10/12/2023	Controlled Source Electromagnetics	07:04	on deck	38° 16,650'	022° 18,941'	0	Receiver 1
M196 15-1	10/12/2023	Controlled Source Electromagnetics	07:26	on deck	38° 16,739'	022° 18,644'	0	Receiver 2
M196 15-1	10/12/2023	Controlled Source Electromagnetics	07:50	on deck	38° 16,842'	022° 18,306'	0	Receiver 3
M196 15-1	10/12/2023	Controlled Source Electromagnetics	07:57	on deck	38° 16,871'	022° 18,211'	0	Receiver 4
M196 15-1	10/12/2023	Controlled Source Electromagnetics	07:58	on deck	38° 16,875'	022° 18,198'	0	Kettenvorlauf
M196 16-1	10/12/2023	Gravity Corer	11:05	in the water	38° 09,068'	022° 43,631'	853	
M196 16-1	10/12/2023	Gravity Corer	11:23	max depth/on ground	38° 09,071'	022° 43,630'	858	SLmax = 869m, SZmax = 41kN
M196 16-1	10/12/2023	Gravity Corer	11:43	on deck	38° 09,071'	022° 43,630'	0	
M196 16-2	10/12/2023	Sound Velocity Profiler	12:23	in the water	38° 09,071'	022° 43,629'	0	

M196 16-2	10/12/2023	Sound Velocity Profiler	12:42	max depth/on ground	38° 09,071'	022° 43,628'	0	SLmax = 751m
M196 16-2	10/12/2023	Sound Velocity Profiler	12:59	on deck	38° 09,070'	022° 43,629'	0	
M196 17-1	10/12/2023	Deep-sea Multibeam Echosounder	14:07	profile start	38° 14,630'	022° 38,710'	549	
M196 17-1	10/12/2023	Deep-sea Multibeam Echosounder	16:58	profile end	38° 15,825'	022° 40,363'	369	
M196 17-2	10/12/2023	Shallow-water Multibeam Echosounder	14:07	profile start	38° 14,638'	022° 38,710'	538	
M196 17-2	10/12/2023	Shallow-water Multibeam Echosounder	16:58	profile end	38° 15,800'	022° 40,362'	372	
M196 17-3	10/12/2023	P-70 Parasound	14:07	profile start	38° 14,657'	022° 38,710'	542	
M196 17-3	10/12/2023	P-70 Parasound	16:58	profile end	38° 15,776'	022° 40,360'	370	
M196 18-1	10/12/2023	Deep-sea Multibeam Echosounder	17:00	profile start	38° 15,668'	022° 40,322'	401	
M196 18-1	11/12/2023	Deep-sea Multibeam Echosounder	03:00	information	38° 01,221'	022° 48,181'	369	
M196 18-1	11/12/2023	Deep-sea Multibeam Echosounder	03:35	profile end	38° 00,768'	022° 49,037'	204	
M196 18-2	10/12/2023	Shallow-water Multibeam Echosounder	17:00	profile start	38° 15,632'	022° 40,296'	403	
M196 18-2	11/12/2023	Shallow-water Multibeam Echosounder	03:35	profile end	38° 00,775'	022° 49,044'	205	
M196 18-3	10/12/2023	P-70 Parasound	17:00	profile start	38° 15,605'	022° 40,272'	396	
M196 18-3	11/12/2023	P-70 Parasound	03:35	profile end	38° 00,782'	022° 49,050'	208	
M196 19-1	11/12/2023	Gravity Corer	06:29	in the water	38° 16,163'	022° 39,163'	249	
M196 19-1	11/12/2023	Gravity Corer	06:35	max depth/on ground	38° 16,163'	022° 39,163'	249	SLmax = 254m, SZmax = 28.2kN
M196 19-1	11/12/2023	Gravity Corer	06:47	on deck	38° 16,162'	022° 39,167'	248	
M196 19-2	11/12/2023	Gravity Corer	07:16	in the water	38° 16,161'	022° 39,167'	246	
M196 19-2	11/12/2023	Gravity Corer	07:21	max depth/on ground	38° 16,162'	022° 39,168'	246	SLmax = 258m, SZmax = 27,0kN
M196 19-2	11/12/2023	Gravity Corer	07:33	on deck	38° 16,162'	022° 39,166'	248	
M196 19-3	11/12/2023	Gravity Corer	08:26	in the water	38° 16,163'	022° 39,167'	246	
M196 19-3	11/12/2023	Gravity Corer	08:32	max depth/on ground	38° 16,163'	022° 39,166'	247	SLmax = 262m, SZmax = 28,7kN
M196 19-3	11/12/2023	Gravity Corer	08:44	on deck	38° 16,163'	022° 39,166'	248	
M196 19-4	11/12/2023	Sound Velocity Profiler	09:15	in the water	38° 16,162'	022° 39,166'	248	
M196 19-4	11/12/2023	Sound Velocity Profiler	09:33	on deck	38° 16,163'	022° 39,165'	246	
M196 20-1	11/12/2023	CTD	11:53	in the water	38° 07,073'	022° 51,071'	825	clean ship

M196 20-1	11/12/2023	CTD	12:16	max depth/on ground	38° 07,072'	022° 51,070'	825	SLmax = 830m
M196 20-1	11/12/2023	CTD	12:44	on deck	38° 07,073'	022° 51,071'	822	
M196 20-2	11/12/2023	CTD	13:50	in the water	38° 08,897'	022° 44,956'	856	clean ship
M196 20-2	11/12/2023	CTD	14:12	max depth/on ground	38° 08,898'	022° 44,966'	855	
M196 20-2	11/12/2023	CTD	14:31	on deck	38° 08,900'	022° 44,965'	853	
M196 20-3	11/12/2023	CTD	15:29	in the water	38° 10,727'	022° 38,774'	858	clean ship
M196 20-3	11/12/2023	CTD	15:51	max depth/on ground	38° 10,727'	022° 38,771'	870	
M196 20-3	11/12/2023	CTD	16:08	on deck	38° 10,742'	022° 38,762'	857	
M196 20-4	11/12/2023	CTD	17:06	in the water	38° 12,580'	022° 32,579'	855	clean ship
M196 20-4	11/12/2023	CTD	17:29	max depth/on ground	38° 12,572'	022° 32,606'	855	
M196 20-4	11/12/2023	CTD	17:49	on deck	38° 12,593'	022° 32,587'	854	
M196 20-5	11/12/2023	CTD	18:49	in the water	38° 14,411'	022° 26,411'	815	
M196 20-5	11/12/2023	CTD	19:09	max depth/on ground	38° 14,414'	022° 26,405'	816	SLmax = 819m
M196 20-5	11/12/2023	CTD	19:26	on deck	38° 14,413'	022° 26,405'	816	
M196 21-1	11/12/2023	Deep-sea Multibeam Echosounder	20:07	profile start	38° 17,755'	022° 24,275'	533	
M196 21-1	12/12/2023	Deep-sea Multibeam Echosounder	03:44	profile end	38° 19,672'	022° 23,411'	254	
M196 21-2	11/12/2023	Shallow-water Multibeam Echosounder	20:07	profile start	38° 17,767'	022° 24,274'	530	
M196 21-2	12/12/2023	Shallow-water Multibeam Echosounder	03:44	profile end	38° 19,682'	022° 23,420'	255	
M196 21-3	11/12/2023	P-70 Parasound	20:07	profile start	38° 17,782'	022° 24,274'	526	
M196 21-3	12/12/2023	P-70 Parasound	03:44	profile end	38° 19,685'	022° 23,423'	253	
M196 22-1	12/12/2023	Deep-sea Multibeam Echosounder	03:53	profile start	38° 19,278'	022° 24,257'	281	
M196 22-1	12/12/2023	Deep-sea Multibeam Echosounder	07:00	profile end	38° 06,586'	022° 46,178'	860	
M196 22-2	12/12/2023	Shallow-water Multibeam Echosounder	03:53	profile start	38° 19,264'	022° 24,286'	281	
M196 22-2	12/12/2023	Shallow-water Multibeam Echosounder	07:00	profile end	38° 06,579'	022° 46,187'	858	
M196 22-3	12/12/2023	P-70 Parasound	03:53	profile start	38° 19,250'	022° 24,315'	290	
M196 22-3	12/12/2023	P-70 Parasound	07:00	profile end	38° 06,571'	022° 46,200'	858	
M196 23-1	12/12/2023	Gravity Corer	08:30	in the water	38° 10,104'	022° 40,873'	856	
M196 23-1	12/12/2023	Gravity Corer	08:45	max depth/on ground	38° 10,100'	022° 40,869'	858	SLmax = 872m, SZmax = 38,9kN
M196 23-1	12/12/2023	Gravity Corer	09:06	on deck	38° 10,100'	022° 40,868'	857	
M196 23-2	12/12/2023	Gravity Corer	10:21	in the water	38° 10,100'	022° 40,868'	855	

M196 23-2	12/12/2023	Gravity Corer	10:40	max depth/on ground	38° 10,100'	022° 40,866'	857	SLmax = 874 m , SZmax = 39,9 kN
M196 23-2	12/12/2023	Gravity Corer	11:03	on deck	38° 10,100'	022° 40,867'	858	
M196 23-3	12/12/2023	Gravity Corer	11:51	in the water	38° 10,100'	022° 40,867'	857	
M196 23-3	12/12/2023	Gravity Corer	12:08	max depth/on ground	38° 10,100'	022° 40,867'	858	SLmax = 873 m, SZmax = 38,5 kN
M196 23-3	12/12/2023	Gravity Corer	12:30	on deck	38° 10,100'	022° 40,867'	857	
M196 24-1	12/12/2023	Controlled Source Electromagnetics	14:43	in the water	38° 02,862'	022° 51,783'	314	Kettenvorlauf
M196 24-1	12/12/2023	Controlled Source Electromagnetics	14:46	in the water	38° 02,872'	022° 51,766'	321	Receiver 4
M196 24-1	12/12/2023	Controlled Source Electromagnetics	14:55	in the water	38° 02,912'	022° 51,705'	352	Receiver 3
M196 24-1	12/12/2023	Controlled Source Electromagnetics	15:05	in the water	38° 02,954'	022° 51,641'	471	Receiver 2
M196 24-1	12/12/2023	Controlled Source Electromagnetics	15:13	in the water	38° 02,985'	022° 51,596'	528	Receiver 1
M196 24-1	12/12/2023	Controlled Source Electromagnetics	15:21	in the water	38° 03,019'	022° 51,543'	587	Elektrode 1
M196 24-1	12/12/2023	Controlled Source Electromagnetics	15:31	in the water	38° 03,059'	022° 51,485'	619	Elektrode 2
M196 24-1	12/12/2023	Controlled Source Electromagnetics	15:50	in the water	38° 03,142'	022° 51,359'	715	Schwein
M196 24-1	12/12/2023	Controlled Source Electromagnetics	16:50	profile start	38° 03,384'	022° 50,988'	834	
M196 24-1	13/12/2023	Controlled Source Electromagnetics	17:19	profile end	38° 13,234'	022° 36,162'	0	
M196 24-1	13/12/2023	Controlled Source Electromagnetics	18:36	on deck	38° 13,233'	022° 36,160'	0	Schwein
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:00	on deck	38° 13,257'	022° 36,128'	0	Elektrode 2
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:08	on deck	38° 13,301'	022° 36,059'	0	Elektrode 1
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:14	on deck	38° 13,342'	022° 36,020'	0	Receiver 1
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:30	on deck	38° 13,474'	022° 35,979'	0	Receiver 2
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:40	on deck	38° 13,546'	022° 35,946'	0	Receiver 3
M196 24-1	13/12/2023	Controlled Source Electromagnetics	19:43	on deck	38° 13,569'	022° 35,938'	0	alles an deck
M196 25-1	13/12/2023	Deep-sea Multibeam Echosounder	23:07	profile start	38° 16,933'	022° 04,650'	305	
M196 25-2	13/12/2023	Shallow-water Multibeam Echosounder	23:07	profile start	38° 16,933'	022° 04,650'	305	
M196 25-3	13/12/2023	P-70 Parasound	23:07	profile start	38° 16,933'	022° 04,650'	305	
M196 25-1	14/12/2023	Deep-sea Multibeam Echosounder	03:14	profile end	38° 18,331'	022° 05,801'	389	
M196 25-3	14/12/2023	P-70 Parasound	03:14	on deck	38° 18,317'	022° 05,848'	390	
M196 25-2	14/12/2023	Shallow-water Multibeam Echosounder	03:15	profile end	38° 18,287'	022° 05,961'	391	
M196 26-1	14/12/2023	Gravity Corer	06:17	in the water	38° 18,265'	022° 28,365'	218	

M196 26-1	14/12/2023	Gravity Corer	06:23	max depth/on ground	38° 18,266'	022° 28,365'	218	SLmax = 219m, SZmax = 27,8kN
M196 26-1	14/12/2023	Gravity Corer	06:34	on deck	38° 18,265'	022° 28,365'	213	
M196 26-2	14/12/2023	Gravity Corer	06:55	in the water	38° 18,266'	022° 28,365'	215	
M196 26-2	14/12/2023	Gravity Corer	07:01	max depth/on ground	38° 18,265'	022° 28,365'	216	SLmax = 227m, SZmax = 27,8kN
M196 26-2	14/12/2023	Gravity Corer	07:13	on deck	38° 18,265'	022° 28,365'	209	
M196 26-3	14/12/2023	Gravity Corer	07:38	in the water	38° 18,266'	022° 28,365'	219	
M196 26-3	14/12/2023	Gravity Corer	07:43	max depth/on ground	38° 18,266'	022° 28,365'	213	SLmax = 223m, SZmax = 28,1kN
M196 26-3	14/12/2023	Gravity Corer	07:55	on deck	38° 18,266'	022° 28,364'	217	
M196 26-4	14/12/2023	Gravity Corer	09:45	in the water	38° 19,193'	022° 25,219'	283	
M196 26-4	14/12/2023	Gravity Corer	09:51	max depth/on ground	38° 19,193'	022° 25,219'	279	SLmax = 310m, SZmax = 35,3kN
M196 26-4	14/12/2023	Gravity Corer	10:05	on deck	38° 19,193'	022° 25,219'	281	
M196 27-1	14/12/2023	Deep-sea Multibeam Echosounder	11:45	profile start	38° 14,943'	022° 16,166'	683	
M196 27-1	15/12/2023	Deep-sea Multibeam Echosounder	06:08	profile end	38° 15,720'	022° 20,762'	749	
M196 27-2	14/12/2023	Shallow-water Multibeam Echosounder	11:45	profile start	38° 14,925'	022° 16,223'	687	
M196 27-2	15/12/2023	Shallow-water Multibeam Echosounder	06:08	profile end	38° 15,776'	022° 20,760'	744	
M196 27-3	14/12/2023	Shallow-water Multibeam Echosounder	11:45	profile start	38° 14,900'	022° 16,303'	691	
M196 27-3	15/12/2023	Shallow-water Multibeam Echosounder	06:08	profile end	38° 15,754'	022° 20,755'	745	
M196 28-1	15/12/2023	Gravity Corer	07:49	in the water	38° 11,934'	022° 33,761'	859	
M196 28-1	15/12/2023	Gravity Corer	08:05	max depth/on ground	38° 11,933'	022° 33,760'	857	SLmax = 874m, SZmax = 30,7kN
M196 28-1	15/12/2023	Gravity Corer	08:26	on deck	38° 11,934'	022° 33,760'	857	
M196 28-2	15/12/2023	Gravity Corer	08:54	in the water	38° 11,933'	022° 33,760'	858	
M196 28-2	15/12/2023	Gravity Corer	09:10	max depth/on ground	38° 11,933'	022° 33,761'	859	SLmax = 880m, SZmax = 31,4kN
M196 28-2	15/12/2023	Gravity Corer	09:33	on deck	38° 11,933'	022° 33,761'	859	

M196 29-1	15/12/2023	Ocean bottom electromagnetic receiver	11:33	information	38° 07,887'	022° 47,317'	857	OBEM 6, Ranging 1
M196 29-1	15/12/2023	Ocean bottom electromagnetic receiver	12:04	information	38° 07,874'	022° 47,904'	0	OBEM 6, Ranging 2
M196 29-1	15/12/2023	Ocean bottom electromagnetic receiver	12:23	information	38° 08,384'	022° 47,648'	0	OBEM 6, Ranging 3
M196 29-2	15/12/2023	Ocean bottom electromagnetic receiver	13:39	information	38° 09,571'	022° 40,115'	0	OBEM 5, Ranging 1
M196 29-2	15/12/2023	Ocean bottom electromagnetic receiver	14:03	information	38° 09,715'	022° 39,503'	0	OBEM 5, Ranging 2
M196 29-2	15/12/2023	Ocean bottom electromagnetic receiver	14:30	information	38° 10,169'	022° 39,924'	0	OBEM 5, Ranging 3
M196 29-3	15/12/2023	Ocean bottom electromagnetic receiver	15:31	information	38° 11,747'	022° 33,511'	0	OBEM 4 Ranging 1, keine Antwort
M196 29-3	15/12/2023	Ocean bottom electromagnetic receiver	15:53	information	38° 11,184'	022° 33,126'	0	OBEM 4 Ranging 2, keine Antwort
M196 29-4	15/12/2023	Ocean bottom electromagnetic receiver	16:58	information	38° 13,384'	022° 26,886'	0	OBEM 3 Ranging 1
M196 29-4	15/12/2023	Ocean bottom electromagnetic receiver	17:16	information	38° 13,533'	022° 27,568'	0	OBEM 3 Ranging 2
M196 29-4	15/12/2023	Ocean bottom electromagnetic receiver	17:34	information	38° 12,989'	022° 27,316'	0	OBEM 3 Ranging 3
M196 29-4	15/12/2023	Ocean bottom electromagnetic receiver	18:12	information	38° 13,596'	022° 27,130'	0	OBEM 3 ausgelöst
M196 29-4	15/12/2023	Ocean bottom electromagnetic receiver	19:15	on deck	38° 13,413'	022° 26,996'	0	OBEM 3
M196 29-5	15/12/2023	Ocean bottom electromagnetic receiver	19:59	information	38° 14,923'	022° 23,324'	0	OBEM 2 Ranging 1
M196 29-5	15/12/2023	Ocean bottom electromagnetic receiver	20:31	information	38° 14,616'	022° 22,949'	0	OBEM 2 Ranging 2
M196 29-5	15/12/2023	Ocean bottom electromagnetic receiver	21:00	information	38° 15,033'	022° 22,757'	0	OBEM 2 Ranging 3
M196 29-6	15/12/2023	Ocean bottom electromagnetic receiver	22:53	information	38° 16,097'	022° 18,536'	0	OBEM 1, Ranging 1
M196 29-6	15/12/2023	Ocean bottom electromagnetic receiver	23:23	information	38° 16,242'	022° 18,244'	0	OBEM 1, Ranging 2
M196 29-6	15/12/2023	Ocean bottom electromagnetic receiver	23:36	information	38° 16,267'	022° 17,902'	0	OBEM 1, Ranging 3
M196 29-6	15/12/2023	Ocean bottom electromagnetic receiver	23:40	information	38° 16,264'	022° 17,951'	0	release
M196 29-6	16/12/2023	Ocean bottom electromagnetic receiver	00:30	on deck	38° 16,595'	022° 18,266'	0	
M196 30-2	16/12/2023	Shallow-water Multibeam Echosounder	01:10	profile start	38° 15,639'	022° 20,907'	743	
M196 30-3	16/12/2023	P-70 Parasound	01:10	profile start	38° 15,639'	022° 20,907'	743	
M196 30-1	16/12/2023	Deep-sea Multibeam Echosounder	01:10	profile start	38° 15,639'	022° 20,907'	743	
M196 30-1	16/12/2023	Deep-sea Multibeam Echosounder	05:52	profile end	38° 14,604'	022° 24,353'	802	
M196 30-2	16/12/2023	Shallow-water Multibeam Echosounder	05:52	profile end	38° 14,597'	022° 24,360'	804	

M196 30-3	16/12/2023	P-70 Parasound	05:52	profile end	38° 14,591'	022° 24,367'	804	
M196 31-1	16/12/2023	Gravity Corer	06:23	in the water	38° 14,642'	022° 24,459'	802	W12
M196 31-1	16/12/2023	Gravity Corer	06:43	max depth/on ground	38° 14,644'	022° 24,458'	803	SLmax = 816m, SZmax = 35,4kN
M196 31-1	16/12/2023	Gravity Corer	07:03	on deck	38° 14,641'	022° 24,458'	802	
M196 32-1	16/12/2023	Gravity Corer	10:07	in the water	38° 08,890'	022° 41,522'	852	
M196 32-1	16/12/2023	Gravity Corer	10:37	max depth/on ground	38° 08,887'	022° 41,526'	852	SLmax = 870m, 34,1 kN
M196 32-1	16/12/2023	Gravity Corer	10:47	on deck	38° 08,889'	022° 41,525'	852	
M196 33-1	16/12/2023	Sound Velocity Profiler	15:50	in the water	38° 18,498'	022° 06,904'	405	W12
M196 33-1	16/12/2023	Sound Velocity Profiler	16:01	max depth/on ground	38° 18,498'	022° 06,905'	406	SLmax = 350m
M196 33-1	16/12/2023	Sound Velocity Profiler	16:14	on deck	38° 18,498'	022° 06,904'	405	
M196 34-1	16/12/2023	Deep-sea Multibeam Echosounder	16:45	profile start	38° 18,666'	022° 06,643'	403	
M196 34-1	17/12/2023	Deep-sea Multibeam Echosounder	05:45	profile end	38° 18,204'	022° 05,262'	378	
M196 34-2	16/12/2023	Shallow-water Multibeam Echosounder	16:54	profile start	38° 19,017'	022° 05,465'	383	
M196 34-2	17/12/2023	Shallow-water Multibeam Echosounder	05:45	profile end	38° 18,191'	022° 05,303'	379	
M196 34-3	16/12/2023	P-70 Parasound	16:54	profile start	38° 19,026'	022° 05,434'	382	
M196 34-3	17/12/2023	P-70 Parasound	05:45	profile end	38° 18,186'	022° 05,319'	379	
M196 35-2	17/12/2023	Deep-sea Multibeam Echosounder	06:44	profile end	38° 15,297'	022° 08,591'	49	
M196 35-2	17/12/2023	Deep-sea Multibeam Echosounder	06:59	profile start	38° 15,340'	022° 08,672'	54	
M196 35-1	17/12/2023	P-70 Parasound	06:44	profile end	38° 15,312'	022° 08,579'	50	
M196 35-1	17/12/2023	P-70 Parasound	06:59	profile start	38° 15,296'	022° 08,702'	53	
M196 35-3	17/12/2023	Shallow-water Multibeam Echosounder	06:44	profile end	38° 15,346'	022° 08,552'	49	
M196 35-3	17/12/2023	Shallow-water Multibeam Echosounder	06:59	profile start	38° 15,307'	022° 08,694'	53	
M196 35-4	17/12/2023	Video CTD	07:33	in the water	38° 14,484'	022° 09,173'	51	
M196 35-4	17/12/2023	Video CTD	08:00	recording start	38° 14,481'	022° 09,165'	51	
M196 35-4	17/12/2023	Video CTD	11:02	on deck	38° 15,236'	022° 08,718'	52	
M196 35-4	17/12/2023	Video CTD	11:55	in the water	38° 15,236'	022° 08,717'	52	
M196 35-4	17/12/2023	Video CTD	12:09	on deck	38° 15,237'	022° 08,718'	52	
M196 35-4	17/12/2023	Video CTD	12:54	in the water	38° 15,235'	022° 08,717'	52	
M196 35-4	17/12/2023	Video CTD	13:06	on deck	38° 15,237'	022° 08,719'	52	
M196 35-4	17/12/2023	Video CTD	13:19	in the water	38° 15,237'	022° 08,718'	52	

					15,237'			
M196 35-4	17/12/2023	Video CTD	13:32	recording start	38° 15,236'	022° 08,720'	52	
M196 35-4	17/12/2023	Video CTD	14:57	information	38° 14,521'	022° 09,178'	51	Profil Ende
M196 35-4	17/12/2023	Video CTD	15:05	on deck	38° 14,522'	022° 09,179'	51	
M196 36-1	17/12/2023	Video CTD	16:07	in the water	38° 15,168'	022° 08,850'	53	W12, clean ship
M196 36-1	17/12/2023	Video CTD	16:48	max depth/on ground	38° 15,163'	022° 08,848'	54	SLmax = 54m
M196 36-1	17/12/2023	Video CTD	17:19	on deck	38° 15,160'	022° 08,823'	53	
M196 37-1	17/12/2023	Ocean bottom electromagnetic receiver	21:21	in the water	38° 09,317'	022° 42,368'	0	OBEM 8
M196 37-1	17/12/2023	Ocean bottom electromagnetic receiver	21:49	information	38° 09,315'	022° 42,369'	0	OBEM 8 released
M196 37-1	17/12/2023	Ocean bottom electromagnetic receiver	22:09	on deck	38° 09,315'	022° 42,369'	0	
M196 37-2	17/12/2023	Ocean bottom electromagnetic receiver	22:53	in the water	38° 08,750'	022° 45,030'	0	
M196 37-2	17/12/2023	Ocean bottom electromagnetic receiver	23:26	information	38° 08,732'	022° 45,030'	0	Released
M196 37-2	17/12/2023	Ocean bottom electromagnetic receiver	23:40	on deck	38° 08,732'	022° 45,029'	0	
M196 38-1	18/12/2023	Sound Velocity Profiler	00:44	in the water	38° 07,619'	022° 50,502'	815	
M196 38-1	18/12/2023	Sound Velocity Profiler	01:02	max depth/on ground	38° 07,618'	022° 50,501'	813	SLmax = 750m
M196 38-1	18/12/2023	Sound Velocity Profiler	01:21	on deck	38° 07,596'	022° 50,450'	823	
M196 39-1	18/12/2023	Deep-sea Multibeam Echosounder	01:35	profile start	38° 07,596'	022° 50,449'	823	
M196 39-1	18/12/2023	Deep-sea Multibeam Echosounder	06:28	profile end	38° 14,995'	022° 08,984'	0	
M196 39-2	18/12/2023	Shallow-water Multibeam Echosounder	01:35	profile start	38° 07,595'	022° 50,447'	827	
M196 39-2	18/12/2023	Shallow-water Multibeam Echosounder	06:28	profile end	38° 14,996'	022° 08,984'	0	
M196 39-3	18/12/2023	P-70 Parasound	01:35	profile start	38° 07,593'	022° 50,442'	829	
M196 39-3	18/12/2023	P-70 Parasound	06:28	profile end	38° 14,995'	022° 08,984'	0	
M196 40-1	18/12/2023	Remote Operated Vehicle	06:58	information	38° 14,987'	022° 08,955'	0	Meteorit zu Wasser
M196 40-1	18/12/2023	Remote Operated Vehicle	07:50	in the water	38° 14,981'	022° 08,932'	0	Mini-ROV
M196 40-1	18/12/2023	Remote Operated Vehicle	09:00	information	38° 15,000'	022° 09,007'	0	
M196 40-1	18/12/2023	Remote Operated Vehicle	09:12	on deck	38° 15,019'	022° 09,000'	0	
M196 40-1	18/12/2023	Remote Operated Vehicle	10:10	information	38° 15,041'	022° 08,989'	0	Boot mit ROV zurück an Bord
M196 41-1	18/12/2023	Sound Velocity Profiler	15:44	in the water	38° 07,706'	022° 50,429'	0	W12
M196 41-1	18/12/2023	Sound Velocity Profiler	16:02	max depth/on ground	38° 07,700'	022° 50,420'	0	SLmax = 675m
M196 41-1	18/12/2023	Sound Velocity Profiler	16:20	on deck	38° 07,697'	022° 50,412'	0	
M196 42-1	18/12/2023	Controlled Source	16:29	in the water	38°	022° 50,463'	0	Receiver 1



		Electromagnetics			07,640'			
M196 42-1	18/12/2023	Controlled Source Electromagnetics	16:39	in the water	38° 07,660'	022° 50,373'	0	Receiver 2
M196 42-1	18/12/2023	Controlled Source Electromagnetics	16:46	in the water	38° 07,677'	022° 50,304'	0	Receiver 3
M196 42-1	18/12/2023	Controlled Source Electromagnetics	16:56	in the water	38° 07,698'	022° 50,199'	0	Elektrode 1
M196 42-1	18/12/2023	Controlled Source Electromagnetics	17:04	in the water	38° 07,714'	022° 50,124'	0	Elektrode 2
M196 42-1	18/12/2023	Controlled Source Electromagnetics	17:27	in the water	38° 07,749'	022° 49,939'	0	Schwein
M196 42-1	18/12/2023	Controlled Source Electromagnetics	18:20	profile start	38° 07,767'	022° 49,945'	0	
M196 42-1	19/12/2023	Controlled Source Electromagnetics	08:00	profile end	38° 10,287'	022° 38,224'	0	
M196 42-1	19/12/2023	Controlled Source Electromagnetics	08:49	on deck	38° 10,353'	022° 37,954'	0	Schwein
M196 42-1	19/12/2023	Controlled Source Electromagnetics	09:02	on deck	38° 10,371'	022° 37,876'	0	Elektrode 2
M196 42-1	19/12/2023	Controlled Source Electromagnetics	09:03	on deck	38° 10,371'	022° 37,875'	0	Elektrode 1
M196 42-1	19/12/2023	Controlled Source Electromagnetics	09:17	on deck	38° 10,375'	022° 37,841'	0	Receiver 3
M196 42-1	19/12/2023	Controlled Source Electromagnetics	09:29	on deck	38° 10,381'	022° 37,801'	0	Receiver 2
M196 42-1	19/12/2023	Controlled Source Electromagnetics	09:38	on deck	38° 10,386'	022° 37,771'	0	Receiver 1
M196 43-1	19/12/2023	Gravity Corer	10:42	in the water	38° 10,202'	022° 44,847'	0	
M196 43-1	19/12/2023	Gravity Corer	10:57	max depth/on ground	38° 10,196'	022° 44,857'	856	SLmax = 874m, SZmax = 35,1kN
M196 43-1	19/12/2023	Gravity Corer	11:20	on deck	38° 10,200'	022° 44,861'	858	
M196 44-1	19/12/2023	Gravity Corer	12:19	in the water	38° 08,207'	022° 43,435'	860	
M196 44-1	19/12/2023	Gravity Corer	12:34	max depth/on ground	38° 08,202'	022° 43,423'	856	SLmax = 872m, SZmax = 34,9kN
M196 44-1	19/12/2023	Gravity Corer	12:56	on deck	38° 08,214'	022° 43,449'	857	
M196 45-1	19/12/2023	Ocean bottom electromagnetic receiver	14:27	information	38° 09,995'	022° 39,715'	0	Nr. 5, released
M196 45-1	19/12/2023	Ocean bottom electromagnetic receiver	14:40	information	38° 10,020'	022° 39,743'	0	aufgetaucht
M196 45-1	19/12/2023	Ocean bottom electromagnetic receiver	14:59	on deck	38° 09,862'	022° 40,149'	0	
M196 45-2	19/12/2023	Ocean bottom electromagnetic receiver	15:45	information	38° 09,485'	022° 42,595'	0	Nr. 08, released
M196 45-2	19/12/2023	Ocean bottom electromagnetic receiver	15:53	information	38° 09,470'	022° 42,571'	0	aufgetaucht
M196 45-2	19/12/2023	Ocean bottom electromagnetic receiver	16:08	on deck	38° 09,306'	022° 42,565'	0	
M196 46-1	19/12/2023	Sound Velocity Profiler	17:19	in the water	38° 06,607'	022° 44,541'	0	W12
M196 46-1	19/12/2023	Sound Velocity Profiler	17:36	max depth/on ground	38° 06,644'	022° 44,537'	861	SLmax = 750m
M196 46-1	19/12/2023	Sound Velocity Profiler	17:54	on deck	38° 06,681'	022° 44,515'	858	
M196 47-1	19/12/2023	Deep-sea Multibeam Echosounder	18:16	profile start	38° 06,880'	022° 44,365'	863	

M196 47-1	19/12/2023	Deep-sea Multibeam Echosounder	20:38	profile end	38° 09,714'	022° 56,589'	294	
M196 47-2	19/12/2023	Shallow-water Multibeam Echosounder	18:16	profile start	38° 06,900'	022° 44,360'	861	
M196 47-2	19/12/2023	Shallow-water Multibeam Echosounder	20:38	profile end	38° 09,721'	022° 56,569'	291	
M196 47-3	19/12/2023	P-70 Parasound	18:16	profile start	38° 06,901'	022° 44,359'	861	
M196 47-3	19/12/2023	P-70 Parasound	20:38	profile end	38° 09,732'	022° 56,539'	292	
M196 48-1	19/12/2023	Sound Velocity Profiler	21:00	in the water	38° 09,723'	022° 57,161'	292	
M196 48-1	19/12/2023	Sound Velocity Profiler	21:05	max depth/on ground	38° 09,723'	022° 57,160'	293	SLmax = 250m
M196 48-1	19/12/2023	Sound Velocity Profiler	21:19	on deck	38° 09,739'	022° 57,178'	290	
M196 49-2	19/12/2023	Shallow-water Multibeam Echosounder	21:40	profile start	38° 09,503'	022° 57,034'	310	
M196 49-2	20/12/2023	Shallow-water Multibeam Echosounder	03:30	profile end	38° 04,553'	022° 52,399'	746	
M196 49-1	19/12/2023	Deep-sea Multibeam Echosounder	21:40	profile start	38° 09,458'	022° 56,992'	315	
M196 49-1	20/12/2023	Deep-sea Multibeam Echosounder	03:30	profile end	38° 04,563'	022° 52,381'	755	
M196 49-3	19/12/2023	P-70 Parasound	21:40	profile start	38° 09,441'	022° 56,975'	315	
M196 49-3	20/12/2023	P-70 Parasound	03:31	profile end	38° 04,576'	022° 52,360'	768	
M196 50-1	19/12/2023	Sound Velocity Profiler	23:26	in the water	37° 59,705'	022° 48,047'	117	
M196 50-1	19/12/2023	Sound Velocity Profiler	23:32	max depth/on ground	37° 59,705'	022° 48,047'	121	SLmax = 100m
M196 50-1	19/12/2023	Sound Velocity Profiler	23:39	on deck	37° 59,705'	022° 48,047'	114	
M196 51-1	20/12/2023	Ocean bottom electromagnetic receiver	05:59	information	38° 08,231'	022° 47,645'	0	OBEM 6 released
M196 51-1	20/12/2023	Ocean bottom electromagnetic receiver	06:30	information	38° 08,259'	022° 47,698'	0	aufgetaucht
M196 51-1	20/12/2023	Ocean bottom electromagnetic receiver	07:00	on deck	38° 08,248'	022° 47,940'	0	
M196 52-1	20/12/2023	Ocean bottom electromagnetic receiver	09:30	information	38° 08,445'	022° 47,237'	0	OBEM 7 aufgetaucht
M196 52-1	20/12/2023	Ocean bottom electromagnetic receiver	10:06	on deck	38° 07,046'	022° 49,707'	0	
M196 53-1	20/12/2023	Video Multi Corer	13:23	in the water	38° 14,884'	022° 22,842'	0	W12
M196 53-1	20/12/2023	Video Multi Corer	13:24	information	38° 14,885'	022° 22,841'	0	Ausgelöst
M196 53-1	20/12/2023	Video Multi Corer	13:57	max depth/on ground	38° 14,881'	022° 22,838'	0	SLmax = 820m
M196 53-1	20/12/2023	Video Multi Corer	14:34	on deck	38° 14,899'	022° 22,890'	0	
M196 53-1	20/12/2023	Video Multi Corer	14:52	in the water	38° 14,898'	022° 22,831'	0	
M196 53-1	20/12/2023	Video Multi Corer	17:04	on deck	38° 14,896'	022° 22,824'	792	
M196 54-1	20/12/2023	Ocean bottom electromagnetic receiver	18:04	on deck	38° 14,699'	022° 16,029'	684	
M196 55-1	20/12/2023	Deep-sea Multibeam Echosounder	20:04	profile start	38° 13,580'	022° 17,707'	725	

M196 55-1	21/12/2023	Deep-sea Multibeam Echosounder	05:11	profile end	38° 16,806'	022° 12,161'	518	
M196 55-2	20/12/2023	Shallow-water Multibeam Echosounder	20:04	profile start	38° 13,630'	022° 17,680'	724	
M196 55-2	21/12/2023	Shallow-water Multibeam Echosounder	05:11	profile end	38° 16,849'	022° 12,185'	521	
M196 55-3	20/12/2023	P-70 Parasound	20:05	profile start	38° 13,654'	022° 17,666'	723	
M196 55-3	21/12/2023	P-70 Parasound	05:11	profile end	38° 16,803'	022° 12,159'	526	
M196 56-1	21/12/2023	Remote Operated Vehicle	07:52	in the water	38° 14,836'	022° 08,964'	53	
M196 56-1	21/12/2023	Remote Operated Vehicle	09:56	information	38° 14,834'	022° 08,965'	54	aufgetaucht
M196 56-1	21/12/2023	Remote Operated Vehicle	10:00	on deck	38° 14,835'	022° 08,964'	53	