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Short Cruise Report
R/V MARIA S. MERIAN
Cruise MSM119

St. John's, Canada - St. John's, Canada
08.07.2023 - 12.08.2023

Chief Scientist: Achim Kopf
Captain: Björn Maass

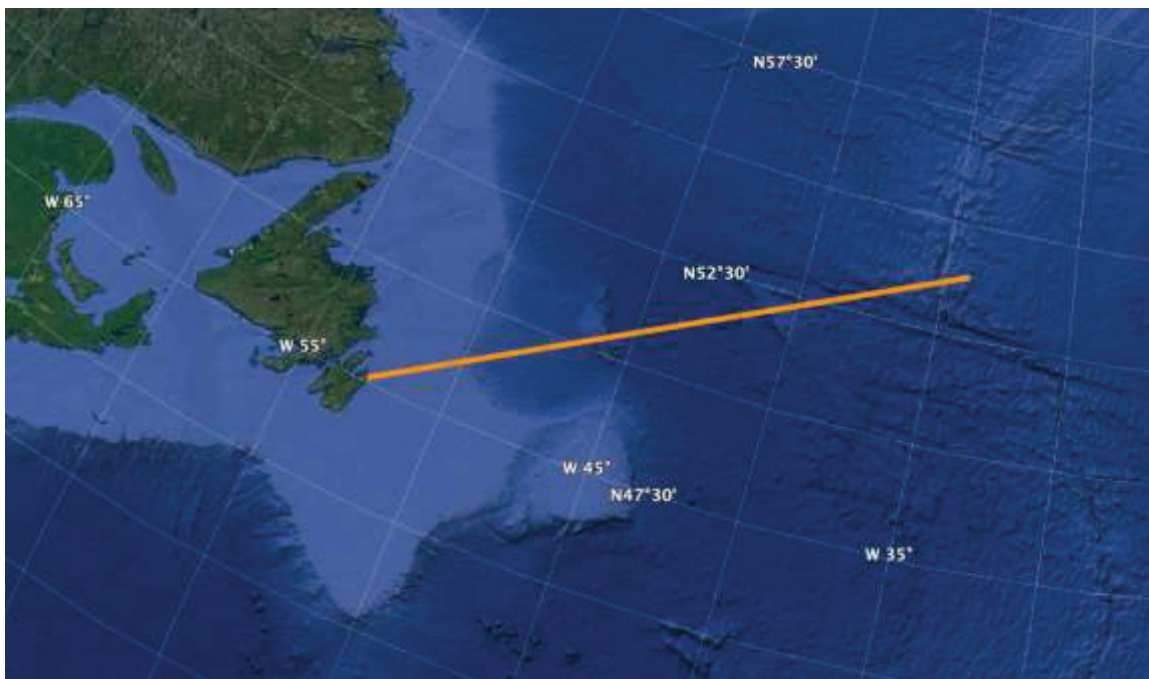


Fig. 1: cruise track of R/V MARIA S. MERIAN cruise MSM119.

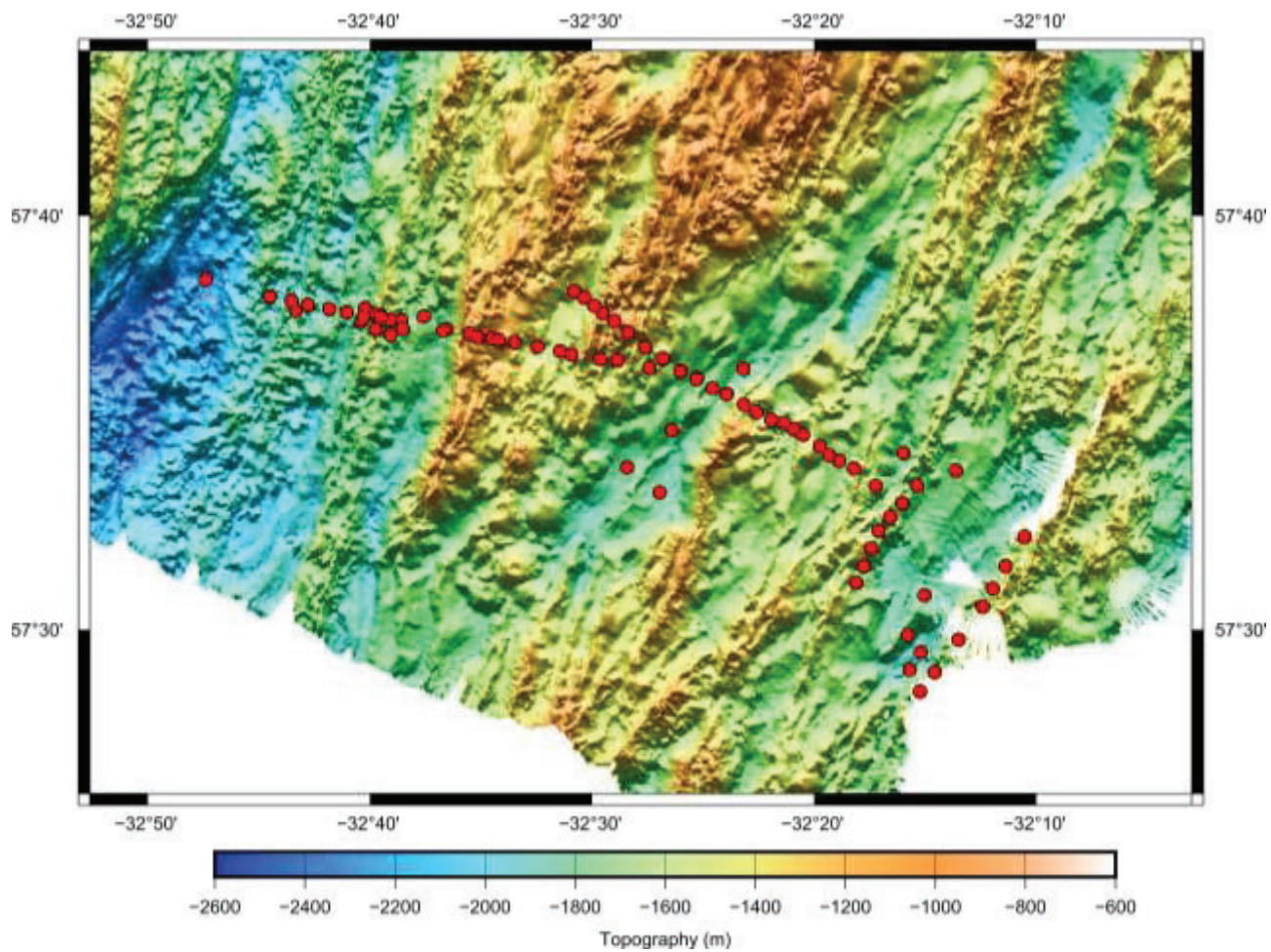


Fig. 2: stations of R/V MARIA S. MERIAN cruise MSM119.

Objectives

The research cruise MSM119, also known as RIFLOR-2, set out to further investigate sedimentary ponds and crustal ridges along the eastern flank of the southernmost tip of the Reykjanes Ridge, Mid-Atlantic Ridge. Based on site-survey work during cruise M183 (2022) with RV METEOR, the MARUM MeBo70 seafloor drill rig represented the main work horse on expedition MSM119. In general, the research focuses on the relevance of hydrothermal circulation in the flanks of oceanic ridges, and in particular of young basaltic crust with low sediment cover on the Reykjanes Ridge south of Iceland. The global importance of these circulation systems for the exchange between the crust and the oceans as well as the deep biosphere and their role in the carbon cycle will be assessed by drilling, sampling and monitoring locations of seawater inflow and outflow in cool and warm regions along a transect from the spreading ridge axis to the ca. 3 Ma old Squid Pond. The post-cruise work will take place in the context of the MARUM Cluster of Excellence "Ocean Floor" and the DAM research mission "CDRmare" (project AIMS³).

The main results of cruise MSM119 include:

- Successful installation of 4 MeBo borehole observatories in a total of 9 holes drilled in 1.500 – 1.700 meters of water depth, with a total penetration of 242 meters below seafloor and an average core recovery of 44%;
- Recovery of 19 gravity cores to characterise sediment in the recharge and discharge ends of Squid Pond and along a transect of very young (ca. 0.1 Ma) to ca. 3 Ma old crust on the Reykjanes Ridge;
- 89 deployments of a T gradient lance;
- Multibeam mapping of a wide area from spreading ridge axis to the Squid Pond at the southern Reykjanes Ridge (RR), including some selected ParaSound profiling along the transects we samples with gravity core and T-lance;
- 5 dredges taken along strike of the RR axis to sample distinct age segments for basaltic crust and other rocks outcropping;
- (Short-term) deployment of the MARUM *develogic* seafloor lander to monitor bottom water composition at a potential discharge site.

Narrative

Cruise MSM119 started in the morning of July 8, 2023 in St. John's, Newfoundland, Canada. After a 4-day ENE-ward transit, the vessel arrived in the working area on the Mid-Atlantic Ridge early on July 12, 2023. Station work on the southern Reykjanes Ridge started with VSP for calibration of the hydroacoustic systems. The station work initially served to explore a small sediment trough on the eastern flank of the ridge. In the so-called Squid Pond we recorded a velocity sound profile and recorded hydroacoustic data before using gravity corers and in situ temperature lances to collect material and data where our understanding was still incomplete after the preliminary investigations during the METEOR cruise M183 in 2022. Both methods have been used primarily on the eastern side of the sediment trough, where cold seawater is charged into the seafloor and continues to circulate westward through the crust, being heated and expelled as hydrothermal fluid again. Changes in oxygen and alkalinity confirm this fluid movement.

Over the weekend, the MARUM MeBo70 drilling rig was used for the first time on the seabed for a pilot drilling in the Squid Pond. After a good 24m of sediment cover, we encountered ocean crust material and had to drill carefully with slow drilling progress. Some pieces of basalt blocked the core barrel at the end of the drilling, as we were able to determine on deck after successfully recovering the drill.

In the week from the 17th to the 23rd of July we successfully continued the multi-methodological research program on the Reykjanes Ridge with consistently good weather conditions. The deployment of equipment included hydroacoustic data acquisition with Multibeam and Parasound, gravity coring, measurements with an in-situ temperature lance, drilling with MARUM MeBo70, and deployment and recovery of a dredge.

Our second drilling with MeBo aimed to completely core the sediments of the Squid Pond near the spreading axis, to take in-situ temperature measurements at intervals of about 5 meters, and then to log the complete sediment sequence with an acoustic borehole tool. The borehole reached into the oceanic crust and cored very solid, cemented sandstones at the transition to the sediment filling, which were probably formed by precipitated solutions from the upper crust.

The periods between the MeBo missions are used to connect the spreading axis with the Squid Pond with a transect of heavy corers and temperature measurements and to better characterize the ridge flank processes. In the considered time slice of the earth's history, i.e. the last 3 million years, we see thermal variability in the data, differently consolidated and

altered sediments, variable pore water compositions, and different proportions of magmatic components. However, only analyzes in the home laboratories will allow conclusions to be drawn as to the extent to which this material comes from the dorsal axis or, for example, from Iceland. In order to trace different magma compositions or changes in the rock-physical properties of the oceanic crustal basalts, complementary short dredge trains are run parallel to crustal age isolines. Initial response shows that fresh or superficially altered basalts are dominant, and more rarely blistered varieties are found. Occasionally, other lithologies were found and are interpreted to represent glacial drop stones.

In the week from the 31st to the 6th of August we had good weather conditions without exception, which we mainly used for three boreholes with the MARUM MeBo70. The gravity corer and dredge as well as the in-situ temperature lance were used between the deployments of the seabed drilling robot.

In total, we managed to drill three boreholes through overburden sediments into the oceanic crustal basalts in the past week. Two of the drill holes were drilled in pairs on a relatively young portion of the ocean ridge flank approximately 80 meters apart. The chemistry of the crustal fluids and the temperature changes deep in the borehole are to be recorded over a period of two years. A third hole was completed in Squid Pond where the ridge is slightly older. This borehole was also fitted with an osmo-sampler observatory and is thus used to record a geochemical time series. Scientific work during that week also encompassed gravity coring, T-gradient measurements and dredging.

During our final working week, a fourth observatory deployment in another MeBo hole at Squid Pond got equipped with a simple T-CORK fabricated on board. There we installed one of only 3 MTLs left from the earlier measurements in the vicinity of the Reykjanes Ridge axis. The final station on August 7 was then a system test of the MARUM seafloor lander, which ascended to the calm Atlantic Ocean in moonshine and with Northern lights over clear skies.

On August 8, 2023 station work ended at 1:26 UTC and R/V MARIA S. MERIAN started its transit back to St. John's, Newfoundland, Canada. There, the cruise ended on August 12, 2023 at 8:36h in the morning with all scientists preparing for departure and MeBo demobilisation.

Acknowledgements

We thank Master Björn Maass and his team on the bridge for their cooperation, and outstanding support during complex operations, partly in heavy weather. Special thanks go also to bosun Plinki and the entire crew of R/V MARIA S. MERIAN for their friendly and professional support and efficient technical assistance with the MeBo70 drill rig and other devices used. Plinki is particularly thanked for tremendous extra efforts at the end of the cruise where he provided the T-CORK observatory and made the observatory part of the cruise a major success.

Colleagues at MARUM Bremen (Vera Bender, Marco Klann, Goetz Ruhland) have also provided crucial help with expedition planning, logistical decisions, and post-cruise demobilisation.

Thanks go also to the German Science Foundation (DFG), the German Federal Ministry for Education and Research (BMBF) and the European Research Council for providing the funds to realize cruise MSM119 with large seagoing gear and costly long-term monitoring technology. Funding was explicitly received through MARUM Cluster of Excellence “The Ocean Floor” (grant EXC2077), AIMS³ within DAM CDRmare (BMBF grant 03F0894), and ERC Synergy project T-Sector (grant ERC-2022-SYG #101071713).

Participants list

Achim Kopf (MARUM), Chief scientist
Emilia Athanasiadis (Univ. Bremen), Hydroacoustics
Markus Bergenthal (MARUM), MeBo
Renée Bernhard (Univ. Bremen), Temperature measurements, Log book
Denise Bethke (AWI), PW and gas chemistry
Ousmane Coulibaly (MARUM), MeBo
Christian Engler (MARUM), MeBo
Timo Fleischmann (MARUM), Temperature measurements, Lander, MeBo
Observatories
Tim Freudenthal (MARUM), MeBo
Ramona Henn (Univ. Bremen), Hydroacoustics, gravity coring, media
Steffen Klar (MARUM), MeBo
Elena Marx (Univ. Bremen), Sedimentology, Log book
Sebastian Meckel (MARUM), MeBo
Pooja Sanjai More (MARUM), MeBo
Christina Nadolsky (AWI), PW and gas chemistry, petrology
Christian Obermaier (MARUM), MeBo
Saskia Stanjura (Univ. Bremen), Physical properties, T measurements, media
Antonia Witzleb (Univ. Bremen), Gravity coring, dredging, osmo sampler
Shuhui Xu (MARUM), Core curation, line scanning
Mingzhen Yu (Harvard Univ.), Sediment description, petrology
Junli Zhang (MARUM), Core lab management, curation

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Station list

GeoB Nr.: Curation number of the MARUM core repository

Gear Abbreviations: SBE/ParaS = Ship-mounted Multibeam/Parasound; XSV = expendable sound velocimeter; GC = Gravity Corer; DREDGE = Chain-bag Dredge; CTD = Conductivity-temperature-density sensor; MeBo = MeBo deployment; Lander = Lander deployment; TL = Temperature Lance.

NOTE: Date/Time/Latitude/Longitude/Water Depth are relative to either the start and end of the operation (SBE/ParaS, XSV, DREDGE, CTD) or the time at which the gear reaches the seafloor (GC, MeBo, TL, Lander).

GeoB Nr.	Gear Type	Date	Time	Latitude	Longitude	Water Depth (m)	Remarks
GeoB25401-1	SBE	09/07/2023	14:20	49°59.043'N	48° 1.978'W	2530	Start
		12/07/2023	7:56	57°30.680'N	32°11.140'W	1471	End
GeoB25401-2	ParaS	09/07/2023	14:20	49°59.043'N	48° 1.978'W	2530	Start
		12/07/2023	7:56	57°30.680'N	32°11.140'W	1471	End
GeoB25402-1	GC	12/07/2023	10:39	57°30.688'N	32°11.131'W	1476	Seafloor
GeoB25402-2	XSV	12/07/2023	9:57	57°30.680'N	32°11.140'W	1465	Start
		12/07/2023	10:02	57°30.680'N	32°11.140'W	1465	End
GeoB25403-1	GC	12/07/2023	15:55	57°33.490'N	32°15.442'W	1690	Seafloor
GeoB25403-2	CTD	12/07/2023	16:41	57°33.491'N	32°15.453'W	1690	Start
		12/07/2023	17:50	57°33.491'N	32°15.453'W	1690	End
GeoB25403-3	MeBo	12/07/2023	11:50	57°33.492'N	32°15.464'W	1690	Start
		12/07/2023	13:38	57°33.474'N	32°15.408'W	1689	End
GeoB25403-4	MeBo	16/07/2023	13:30	57°33.474'N	32°15.408'W	1680	Seafloor
GeoB25404-1	SBE	12/07/2023	17:55	57°33.480'N	32°15.480'W	1690	Start
		13/07/2023	9:59	57°30.890'N	32°15.050'W	1816	End
GeoB25404-2	ParaS	12/07/2023	17:55	57°33.480'N	32°15.480'W	1690	Start
		13/07/2023	9:59	57°30.890'N	32°15.050'W	1816	End
GeoB25405-1	TL	13/07/2023	10:40	57°30.833'N	32°15.042'W	1824	Seafloor
GeoB25405-2	TL	13/07/2023	12:32	57°29.450'N	32°15.208'W	1892	Seafloor
GeoB25405-3	TL	13/07/2023	14:09	57°29.869'N	32°15.780'W	1800	Seafloor
GeoB25405-4	TL	13/07/2023	15:56	57°29.028'N	32°15.704'W	1901	Seafloor
GeoB25405-5	TL	13/07/2023	17:33	57°28.500'N	32°15.232'W	1599	Seafloor
GeoB25406-1	GC	13/07/2023	19:33	57°31.859'N	32°10.630'W	1550	Seafloor
GeoB25407-1	TL	13/07/2023	21:10	57°32.248'N	32°10.520'W	1520	Seafloor
GeoB25407-2	TL	13/07/2023	22:50	57°31.540'N	32°11.380'W	1610	Seafloor
GeoB25407-3	TL	14/07/2023	0:07	57°30.993'N	32°11.958'W	1616	Seafloor
GeoB25407-4	TL	14/07/2023	1:22	57°30.552'N	32°12.407'W	1627	Seafloor
GeoB25407-5	TL	14/07/2023	2:41	57°29.760'N	32°13.499'W	1600	Seafloor
GeoB25407-6	TL	14/07/2023	4:30	57°28.970'N	32°14.576'W	1590	Seafloor

GeoB25407-7	TL	14/07/2023	5:45	57°31.131'N	32°18.107'W	1612	Seafloor
GeoB25407-8	TL	14/07/2023	6:55	57°31.532'N	32°17.764'W	1590	Seafloor
GeoB25407-9	TL	14/07/2023	8:07	57°31.970'N	32°17.442'W	1470	Seafloor
GeoB25407-10	TL	14/07/2023	9:16	57°32.398'N	32°17.102'W	1549	Seafloor
GeoB25407-11	TL	14/07/2023	10:24	57°32.728'N	32°16.576'W	1505	Seafloor
GeoB25407-12	TL	14/07/2023	11:33	57°33.068'N	32°16.046'W	1517	Seafloor
GeoB25407-13	TL	14/07/2023	12:46	57°33.484'N	32°15.379'W	1687	Seafloor
GeoB25408-1	TL	14/07/2023	16:31	57°33.855'N	32°13.624'W	1694	Seafloor
GeoB25408-2	TL	14/07/2023	18:14	57°34.264'N	32°15.972'W	1780	Seafloor
GeoB25408-3	TL	14/07/2023	21:59	57° 33.480' N	32° 17.231' W	1561	Seafloor
GeoB25408-4	TL	14/07/2023	23:22	57° 33.902' N	32° 18.227' W	1622	Seafloor
GeoB25408-5	TL	15/07/2023	0:31	57°34.084'N	32°18.875'W	1638	Seafloor
GeoB25408-6	TL	15/07/2023	1:42	57°34.217'N	32°19.320'W	1610	Seafloor
GeoB25408-7	TL	15/07/2023	2:50	57°34.440'N	32°19.745'W	1550	Seafloor
GeoB25408-8	TL	15/07/2023	4:04	57°34.713'N	32°20.504'W	1497	Seafloor
GeoB25408-9	TL	15/07/2023	5:13	57°34.850'N	32°20.935'W	1516	Seafloor
GeoB25408-10	TL	15/07/2023	6:21	57°35.005'N	32°21.401'W	1560	Seafloor
GeoB25408-11	TL	15/07/2023	7:29	57°35.067'N	32°21.929'W	1541	Seafloor
GeoB25408-12	TL	15/07/2023	8:35	57°35.259'N	32°22.593'W	1435	Seafloor
GeoB25409-1	GC	14/07/2023	20:14	57°32.601'N	32°10.035'W	1613	Seafloor
GeoB25410-1	SBE	16/07/2023	15:32	57°37.225'N	32°10.947'W	1507	Start
		17/07/2023	11:55	57°51.552'N	32°20.616'W	1630	End
GeoB25410-2	ParaS	16/07/2023	15:32	57°37.225'N	32°10.947'W	1507	Start
		17/07/2023	11:55	57°51.552'N	32°20.616'W	1630	End
GeoB25411-1	GC	17/07/2023	12:30	57°30.939'N	32°12.371'W	1630	Seafloor
GeoB25411-2	GC	17/07/2023	14:46	57°31.149'N	32°12.252'W	1650	Seafloor
GeoB25412-1	TL	17/07/2023	17:32	57°35.076'N	32°21.938'W	1551	Seafloor
GeoB25412-2	TL	17/07/2023	19:10	57°35.265'N	32°22.614'W	1421	Seafloor
GeoB25412-3	TL	17/07/2023	20:39	57°35.446'N	32°23.163'W	1425	Seafloor
GeoB25412-4	TL	17/07/2023	21:49	57°35.699'N	32°23.930'W	1797	Seafloor
GeoB25412-5	TL	17/07/2023	23:14	57°35.840'N	32°24.577'W	1744	Seafloor
GeoB25412-6	TL	18/07/2023	0:36	57°36.098'N	32°25.249'W	1728	Seafloor
GeoB25412-7	TL	18/07/2023	1:50	57°36.264'N	32°26.009'W	1682	Seafloor
GeoB25412-8	TL	18/07/2023	3:02	57°36.538'N	32°26.811'W	1508	Seafloor
GeoB25413-1	SBE	18/07/2023	6:23	57°58.080'N	32°15.110'W	1696	Start
		18/07/2023	12:22	57°53.920'N	32°19.530'W	1803	End
GeoB25413-2	ParaS	18/07/2023	6:23	57°58.066'N	32°15.042'W	1701	Start
		18/07/2023	12:22	57°53.920'N	32°19.530'W	1803	End
GeoB25414-1	GC	18/07/2023	14:40	57°37.819'N	32°29.893'W	1461	Seafloor
GeoB25415-1	GC	18/07/2023	16:25	57°36.828'N	32°27.585'W	1437	Seafloor
GeoB25416-1	TL	18/07/2023	17:43	57°36.834'N	32°27.604'W	1442	Seafloor
GeoB25416-2	TL	18/07/2023	18:43	57°37.198'N	32°28.395'W	1141	Seafloor
GeoB25416-3	TL	18/07/2023	19:40	57°37.462'N	32°29.002'W	1219	Seafloor
GeoB25416-4	TL	18/07/2023	20:36	57°37.658'N	32°29.517'W	1209	Seafloor
GeoB25416-5	TL	18/07/2023	21:38	57°37.829'N	32°29.900'W	1438	Seafloor
GeoB25416-6	TL	18/07/2023	22:45	57°38.025'N	32°30.354'W	1525	Seafloor
GeoB25416-7	TL	18/07/2023	23:53	57°38.184'N	32°30.813'W	1477	Seafloor
GeoB25417-1	DREDGE	19/07/2023	1:13	57°38.522'N	32°39.038'W	1450	Start
		19/07/2023	5:44	57°37.660'N	32°39.580'W	1532	End
GeoB25418-1	MeBo	19/07/2023	13:30	57°33.474'N	32°15.406'W	1691	Seafloor

GeoB25419-1	SBE	20/07/2023	19:33	57°33.453'N	32°15.451'W	1685	Start
		21/07/2023	10:40	57°40.987'N	32°48.552'W	1705	End
GeoB25419-2	ParaS	20/07/2023	19:33	57°33.453'N	32°15.451'W	1685	Start
		21/07/2023	10:40	57°40.987'N	32°48.552'W	1705	End
GeoB25419-3	SBE	22/07/2023	4:11	57°38.951'N	32°46.561'W	2130	Start
		22/07/2023	9:55	57°46.794'N	32°38.514'W	2486	End
GeoB25419-4	ParaS	22/07/2023	4:11	57°38.960'N	32°46.606'W	2125	Start
		22/07/2023	9:55	57°46.794'N	32°38.514'W	2486	End
GeoB25419-5	SBE	23/07/2023	23:25	57°37.573'N	32°39.674'W	1492	Start
		24/07/2023	8:05	57°43.577'N	32°30.952'W	1281	End
GeoB25419-6	ParaS	23/07/2023	23:25	57°37.573'N	32°39.674'W	1492	Start
		24/07/2023	8:05	57°43.551'N	32°30.968'W	1271	End
GeoB25420-1	GC	21/07/2023	12:15	57°37.894'N	32°42.688'W	1866	Seafloor
GeoB25420-2	GC	21/07/2023	13:39	57°37.895'N	32°42.686'W	1852	Seafloor
GeoB25421-1	GC	21/07/2023	15:20	57°37.685'N	32°39.621'W	1496	Seafloor
GeoB25422-1	GC	21/07/2023	17:02	57°37.804'N	32°41.254'W	1784	Seafloor
GeoB25423-1	TL	21/07/2023	19:15	57°36.734'N	32°31.437'W	1489	Seafloor
GeoB25423-2	TL	21/07/2023	20:21	57°36.840'N	32°32.461'W	1496	Seafloor
GeoB25423-3	TL	21/07/2023	21:27	57°36.946'N	32°33.487'W	1307	Seafloor
GeoB25423-4	TL	21/07/2023	22:27	57°37.052'N	32°34.507'W	1202	Seafloor
GeoB25423-5	TL	21/07/2023	23:24	57°37.155'N	32°35.533'W	1207	Seafloor
GeoB25423-6	TL	22/07/2023	0:29	57°37.262'N	32°36.550'W	1796	Seafloor
GeoB25423-7	TL	22/07/2023	1:42	57°37.571'N	32°37.572'W	1674	Seafloor
GeoB25423-8	TL	22/07/2023	2:54	57°37.472'N	32°38.590'W	1649	Seafloor
GeoB25424-1	GC	22/07/2023	13:17	57°37.578'N	32°39.615'W	1493	Seafloor
GeoB25424-2	MeBo	22/07/2023	16:27	57°37.575'N	32°39.618'W	1523	Seafloor
GeoB25425-1	GC	24/07/2023	9:50	57°37.368'N	32°37.574'W	1674	Seafloor
GeoB25426-1	MeBo	24/07/2023	14:56	57°33.474'N	32°15.409'W	1696	Seafloor
GeoB25427-1	SBE	25/07/2023	22:30	57°33.807'N	32°15.222'W	1665	Start
		26/07/2023	13:42	57°49.169'N	32° 9.962'W	1278	End
GeoB25427-2	ParaS	25/07/2023	22:30	57°33.807'N	32°15.222'W	1665	Start
		26/07/2023	13:42	57°49.169'N	32° 9.962'W	1278	End
GeoB25428-1	CTD	28/07/2023	12:38	57°37.577'N	32°39.618'W	1500	Start
		28/07/2023	14:01	57°37.578'N	32°39.616'W	1453	End
GeoB25429-1	GC	28/07/2023	15:43	57°36.036'N	32°25.283'W	1729	Seafloor
GeoB25430-1	TL	28/07/2023	17:20	57°35.693'N	32°23.952'W	1796	Seafloor
GeoB25430-2	TL	28/07/2023	18:39	57°36.050'N	32°25.289'W	1729	Seafloor
GeoB25430-3	TL	28/07/2023	19:53	57°36.248'N	32°26.021'W	1687	Seafloor
GeoB25430-4	TL	28/07/2023	21:02	57°36.565'N	32°26.818'W	1497	Seafloor
GeoB25430-5	TL	28/07/2023	22:50	57°33.927'N	32°28.423'W	1825	Seafloor
GeoB25430-6	TL	29/07/2023	0:37	57°33.317'N	32°26.955'W	1834	Seafloor
GeoB25430-7	TL	29/07/2023	2:15	57°34.823'N	32°26.399'W	1810	Seafloor
GeoB25430-8	TL	29/07/2023	3:58	57°36.307'N	32°23.181'W	1818	Seafloor
GeoB25431-1	DREDGE	29/07/2023	5:38	57°37.165'N	32°35.519'W	1138	Start
		29/07/2023	8:59	57°38.011'N	32°35.518'W	1208	End
GeoB25432-1	GC	29/07/2023	9:59	57°36.840'N	32°32.461'W	1501	Seafloor
GeoB25433-1	TL	29/07/2023	11:38	57°36.321'N	32°27.417'W	1530	Seafloor
GeoB25433-2	TL	29/07/2023	13:08	57°36.548'N	32°29.651'W	1447	Seafloor
GeoB25433-3	TL	29/07/2023	14:58	57°37.009'N	32°34.221'W	1214	Seafloor
GeoB25433-4	TL	30/07/2023	18:15	57°37.706'N	32°43.347'W	1874	Seafloor

GeoB25433-5	TL	30/07/2023	19:34	57°37.747'N	32°41.823'W	1873	Seafloor
GeoB25433-6	TL	30/07/2023	21:02	57°37.519'N	32°39.606'W	1529	Seafloor
GeoB25433-7	TL	30/07/2023	22:34	57°37.235'N	32°36.716'W	1798	Seafloor
GeoB25433-8	TL	30/07/2023	23:56	57°37.066'N	32°35.145'W	1158	Seafloor
GeoB25433-9	TL	31/07/2023	1:24	57°36.655'N	32°30.931'W	1509	Seafloor
GeoB25433-10	TL	31/07/2023	2:45	57°36.505'N	32°28.849'W	1472	Seafloor
GeoB25434-1	MeBo	29/07/2023	18:52	57°36.822'N	32°27.595'W	1426.13	Seafloor
GeoB25435-1	GC	30/07/2023	16:38	57°38.062'N	32°44.220'W	1937	Seafloor
GeoB25436-1	DREDGE	31/07/2023	3:41	57°36.590'N	32°29.866'W	1386	Start
		31/07/2023	7:34	57°37.463'N	32°29.211'W	1250	End
GeoB25437-1	GC	31/07/2023	9:11	57°34.849'N	32°20.936'W	1602	Seafloor
GeoB25438-1	GC	31/07/2023	11:39	57°37.537'N	32°38.924'W	1571	Seafloor
GeoB25439-1	MeBo	31/07/2023	14:44	57°37.558'N	32°39.514'W	1524	Seafloor
GeoB25440-1	TL	01/08/2023	13:28	57°37.266'N	32°38.516'W	1631	Seafloor
GeoB25440-2	TL	01/08/2023	14:09	57°37.123'N	32°39.070'W	1673	Seafloor
GeoB25440-3	TL	01/08/2023	14:53	57°37.489'N	32°39.098'W	1556	Seafloor
GeoB25440-4	TL	01/08/2023	15:29	57°37.582'N	32°39.511'W	1488	Seafloor
GeoB25440-5	TL	01/08/2023	16:09	57°37.256'N	32°39.746'W	1556	Seafloor
GeoB25440-6	TL	01/08/2023	16:53	57°37.647'N	32°39.872'W	1647	Seafloor
GeoB25440-7	TL	01/08/2023	17:30	57°37.772'N	32°40.226'W	1783	Seafloor
GeoB25440-8	TL	01/08/2023	18:09	57°37.466'N	32°40.380'W	1759	Seafloor
GeoB25441-1	MeBo	01/08/2023	23:59	57°37.553'N	32°39.583'W	1531	Seafloor
GeoB25442-1	SBE	02/08/2023	15:50	57°37.556'N	32°39.683'W	1492	Start
		03/08/2023	9:47	57°33.945'N	32°14.944'W	1612	End
GeoB25443-1	MeBo	03/08/2023	12:44	57°33.471'N	32°15.404'W	1694	Seafloor
GeoB25444-1	GC	04/08/2023	16:50	57°37.822'N	32°42.034'W	1855	Seafloor
GeoB25445-1	TL	04/08/2023	18:48	57°37.552'N	32°39.529'W	1544	Seafloor
GeoB25445-2	TL	04/08/2023	20:00	57°37.557'N	32°40.295'W	1765	Seafloor
GeoB25445-3	TL	04/08/2023	21:18	57°37.668'N	32°41.057'W	1816	Seafloor
GeoB25445-4	TL	04/08/2023	22:37	57°37.850'N	32°42.791'W	1879	Seafloor
GeoB25445-5	TL	04/08/2023	23:55	57°37.950'N	32°43.536'W	1841	Seafloor
GeoB25445-6	TL	05/08/2023	1:17	57°38.048'N	32°44.507'W	1894	Seafloor
GeoB25445-7	TL	05/08/2023	15:16	57°38.454'N	32°47.401'W	2280	Seafloor
GeoB25445-8	TL	05/08/2023	17:34	57°38.051'N	32°44.511'W	1894	Seafloor
GeoB25445-9	TL	05/08/2023	19:20	57°37.957'N	32°43.545'W	1844	Seafloor
GeoB25445-10	TL	05/08/2023	20:39	57°37.851'N	32°42.793'W	1880	Seafloor
GeoB25445-11	TL	05/08/2023	21:58	57°37.666'N	32°41.055'W	1839	Seafloor
GeoB25445-12	TL	06/08/2023	0:00	57°37.545'N	32°39.516'W	1537	Seafloor
GeoB25446-1	DREDGE	05/08/2023	2:34	57°38.657'N	32°43.809'W	1808	Start
		05/08/2023	5:31	57°38.766'N	32°45.211'W	1884	End
GeoB25447-1	GC	05/08/2023	9:18	57°38.118'N	32°45.744'W	2020	Seafloor
GeoB25448-1	GC	05/08/2023	11:12	57°37.982'N	32°43.481'W	1843	Seafloor
GeoB25449-1	GC	05/08/2023	13:11	57°37.685'N	32°40.203'W	1787	Seafloor
GeoB25450-1	DREDGE	06/08/2023	2:03	57°38.284'N	32°46.688'W	2231	Start
		06/08/2023	5:59	57°38.113'N	32°48.523'W	2258	End
GeoB25451-1	GC	06/08/2023	9:39	57°37.314'N	32°36.759'W	1780	Seafloor
GeoB25452-1	MeBo	06/08/2023	14:14	57°33.473'N	32°15.326'W	1703	Seafloor
GeoB25453-1	LANDER	07/08/2023	18:33	57°33.471'N	32°15.403'W	1690	Seafloor
		08/08/2023	1:26	57°33.589'N	32°15.239'W	1690	Deck