

Short Cruise Report
Maria S. Merian; Cruise No. MSM 31

Tromsø – Bremen
August 17th, 2013 – September 18th, 2013
Chief Scientist: Wolfram Geissler
Captain: Matthias Günther



Objectives

The Arctic changes rapidly in response to global warming and is expected to change even faster in the future (IPCC 2001, 2007, 2013). Large areas of the shelves and continental slopes bordering the Arctic Ocean are characterized by permafrost and the presence of gas hydrates. The slope stability of these areas is challenged by future global warming and potential hydrate dissociation in the Arctic Ocean. This may lead to slope failures. The first, and so far only reported, large-scale slope failure in the Arctic Ocean is the Hinlopen/Yermak Megaslide (HYM). Following our previous studies, we wanted to investigate this giant slope failure and the deeper structure of the Sophia Basin in detail to elucidate the potential causes of the main and following failure events as well as to test existing hypotheses on the generation of this giant submarine landslide. Our investigations focused on (1) pre-site survey of proposed IODP drill sites, (2) deep tectonic structure and seismicity of the Sophia Basin and (3) future failure potential north of Svalbard. Furthermore, we extended measurements along the Spitsbergen Fracture Zone in the Fram Strait, where a new deep-sea slide was discovered last year during cruise MSM 21/4. Also, we tied existing ODP drill holes on top of the southern Yermak Plateau to our new and existing seismic networks.

We applied a combination of hydro-acoustic mapping, deep and high-resolution multi-channel seismic reflection profiling and a wide-angle seismic survey with broad-band ocean-bottom seismometers (BB-OBS). We mapped two headwall and sidewall areas of the HYM for indication of gas seepage including sampling. In addition, we sampled sediments to characterize the young sedimentation record, for dating and for geo-technical analysis.

Short cruise description

We left Tromsø in the evening of August 17th and started our two-day transit to the working area north of Svalbard. On the way we performed a deep-water pressure test for the release units of the ocean-bottom seismometers at 73°30'N 11°18'E. At the same station we also measured the first sound-velocity profile to calibrate the Kongsberg EM122 swath bathymetry sounder. Leaving this first station, we continuously mapped bathymetry (EM122) and shallow sediment architecture (ATLAS PARASOUND sediment echo sounder). On August 20th, we arrived at the first station at the shelf slope north of Spitsbergen Island at 80°32'N 12°59'E. There the first out of ten broad-band ocean-bottom seismometers (BB-OBS) was deployed. At the next station at 80°59'N 13°7'E, a CTD was deployed to sample sound velocity and water. After recovery of the CTD the second BB-OBS was deployed at the same site. Until the morning of August 21st the remaining eight BB-OBS were deployed along a profile across the Hinlopen shelf and in the vicinity of the HYM to record local seismicity and airgun shots along a seismic profile.

After deployment of the last BB-OBS we went to the north and deployed the

Geometrics GeoEel streamer at approximately 7:00 UTC at 81°10'N 15°6'E to start high-resolution multichannel reflection seismic measurements. Due to technical problems with one of the streamer sections we had to recover the equipment. We went further east towards the western slope of the Nordaustlandet shelf to map the area close to the slide sidewalls with EM122 and PARASOUND echo sounders. In the afternoon of August 21st we deployed the streamer and airguns again. After solving some remaining problems with the equipment (Streamer and GI airgun) we could start the seismic measurements at 80°58'N 18°23'E. Before every active seismic operation we performed marine mammal observations (mitigation) according to JNCC regulations to reduce the potential impact of our measurements on whales and any other marine mammals. The seismic measurement across the western Nordaustlandet shelf and the Hinlopen shelf north of Svalbard continued until August 23rd 12:13 UTC when we stopped the profile at 81°8'N 14°54'E. During the measurements some of the BB-OBS were crossed. This will allow calculating seismic velocities within the uppermost sediment layers. The next station was along a flank of a slide block in the Sophia Basin. A similar block was unsuccessfully sampled using a gravity core during a POLARSTERN expedition in 2004. Therefore, we tried to get samples from the steep SE flank of the block (81°14'N 14°50'E) using a dredge. Before deploying the dredge we surveyed the planned track by multibeam and PARASOUND echo sounders. Unfortunately, the dredge only sampled surface mud, including some drop stones and biological samples.

In the evening of August 23rd we finally deployed the 3000 m long SERCEL SEAL streamer and the 6 G airgun array to conduct regional seismic measurements. We started the profiles at 80°56'N 14°56'E. Until the morning of August 27th we measured seismic profiles across the western Nordaustlandet shelf, the Sophia Basin, the Hinlopen shelf and the southern Yermak Plateau. We finished the measurements in the Fram Strait at 80°16'N 2°58'E after crossing ODP sites 910 and 912 and finally the Spitsbergen Fracture Zone. Two times we had to alter the course and stop profiles because we came close to the ice edge. Since the airgun array was not specially prepared for operation in areas with floating ice, we decided to avoid any ice contact. During the measurements we again crossed the BB-OBS to get information on seismic velocities beneath the Hinlopen shelf north of Svalbard. After recovery of the 3000 m streamer and the G airgun array we went back to the Spitsbergen Fracture Zone (80°15'N 3°54'E) to continue measurements with the short streamer and the GI airgun. Close to the fracture zone slides were discovered along the rise of the Yermak Plateau during cruise MSM 21/4. Until the evening of August 28th we measured profiles across several slide head walls in the area.

In the night from August 28th till 29th we measured bathymetry and shallow sediment architecture along the rise of the Yermak Plateau to find a good site for high-resolution sediment sampling. In the morning of August 29th after sighting the newly acquired data, we decided to have a geology station at 80°20'N 3°16'E. Three multicorers (MUC) were deployed to get samples of the uppermost sediments as well as water samples from just above the seafloor. A CTD was deployed to get a sound velocity profile for the calibration of multibeam echo sounder and at the same time to sample seawater. Furthermore, two gravity cores (GC) and one large box corer (GKG) were deployed and successfully recovered. During the night from August 29th till 30th we continued mapping the slide scars and deposits along the Spitsbergen Fracture Zone. On August 30th we had two geological stations, sampling the uppermost sediments close (79°53'N 3°31'E) and within (79°53'N 3°34'E) a slide area to get

samples, which might allow a dating of the slide event. After the station we continued the bathymetry and PARASOUND survey of the northern flank of the Spitsbergen Fracture Zone. In the morning of August 31st we arrived at the ice edge at 80°28'N 0°30'E. In the evening of August 31st we mapped a slide scar, discovered already in bathymetry and seismic data from 2002. The original idea was to find a site for geological sampling to date the slide event. However, the excavated area is already filled by relatively thick contouritic deposits, which cannot be penetrated by simple gravity coring. In the night we arrived on top of the southern Yermak Plateau close to ODP site 910 (80°16'N 6°35'E). In that area we mapped iceberg plough marks by means of EM122 and PARASOUND echo sounders. On September 1st, we had four geological stations to sample the infill of iceberg plough marks in close vicinity to ODP site 910 at 80°16'N 6°36'E, 80°16'N 6°35'E, 80°17'N 6°25'E, and 80°17'N 6°17'E. Sampling was carried out with CTD, multicorer (MUC), gravity corer (GC) and giant box corer (GKG). Until the morning of September 2nd we continued mapping the iceberg plough marks.

In the morning of September 2nd, we again deployed the 3000 m SERCEL streamer and the G airgun array and started a seismic survey at 80°6'N 6°57'E. We headed towards north to measure the sedimentary structure across the Yermak Plateau and the northern part of the Sophia Basin and to connect existing seismic networks on the north-western Yermak Plateau and in the Nansen Basin with our new data as well as with ODP site 910. In the evening of September 2nd we had to interrupt the measurement due to technical problems with the acquisition system. Facing heavy fog and cold water temperatures close to the predicted ice edge, we altered course in the early morning of September 3rd. In the afternoon of September 3rd and again in the morning of September 4th we changed the planned course because we reached the ice edge. In the night from September 4th to 5th we reached our northernmost point at 82°18'N 23°53'E. At this point we took surface water samples (1000 litres) for biological (cultivation) studies at the Alfred Wegener Institute. On September 6th, we finished seismic measurements at noon at 80°49'N 10°51'E and recovered streamer and airgun array. Afterwards we headed towards the first BB-OBS position to recover this instrument at 80°32'N 13°00'E. The recovery went well, however, due to strong currents the instrument drifted quite far from the original deployment site and actually surfaced very close to the vessel at port side. Then we started the bathymetry acquisition with the shallow water multibeam echo sounder EM1002 to map the shelf right west of one of the main head walls of the Hinlopen/Yermak megaslide. Due to technical problems with the licence dongle, we had to operate the echo sounder in blind mode. Coverage (footprint) was estimated from the EM122 sounder, which was operated in parallel. During the night we measured a refraction seismic line across those BB-OBS that we had not yet crossed during acquisition of the reflection seismic lines. In the morning of September 7th, we stopped the profile at 80°7'N 15°48'E close to the coast of Spitsbergen Island. After recovery of the G airgun array, we hauled back along the profile and recovered five BB-OBS successfully. At one site (80°38'N 14°17'E) we deployed a CTD to get a new sound velocity profile.

During the night from September 7th to 8th we continued the mapping of the Hinlopen shelf close to the head walls. In the morning of September 8th, we had a geological station to sample the shallow subsurface at 80°36'N 14°27'E. Furthermore, a CTD was deployed to get water samples and another sound velocity profile. Furthermore, the EM1002 was dismantled from the moon pool. During the afternoon we recovered the remaining BB-OBS without any problems. But, again strong currents were

responsible for the unexpected large drift of some of the instruments. In the late evening we headed towards NW to have a dredge station along the southern flank of Mosby Seamount, an outstanding feature in the central Sophia Basin. The deployment of the dredge at 81°15'N 11°32'E went without any problems, but when the dredge was pulled it got stuck. It took several hours and trials from different directions before the crew could free the rope and finally also the dredge itself. The weak link of the dredge (9 t) did not fail, even though there was tension on the rope of more than 16 t. The dredge was almost empty; one little piece of broken bedrock was recovered.

In the morning we hauled the vessel to the western slope of the Nordaustlandet shelf, one more time. There we continued with bathymetry and PARASOUND echo sounder surveys. For calibration we measured again a sound velocity profile using the CTD. September 10th we again deployed the EM1002 in the moon pool to conduct shallow seafloor mapping. In the morning of September 11th, we sampled shallow sediments at 81°4'N 17°2'E that hopefully will allow a high-resolution reconstruction of the Holocene. Additionally, a CTD was deployed to get water column samples and a new sound velocity profile. After recovery of the GC we deployed the GEOMETRICS GeoEel streamer and the GI airgun to measure again high-resolution seismic profiles across the shelf slope. In-between we changed the source and continued with a MiniG airgun. Seismic acquisition was stopped at 80°56'N 17°3'E in the late evening of September 11th. We went towards the Hinlopen Trough, where we sampled Holocene sediments by means of one GC. After this station our transit back to Bremen began. During our transit through the Hinlopen Strait, we continued mapping the seafloor with the EM1002, EM122 and PARASOUND echo sounders. At the southern end of Hinlopen Strait we dismantled the EM1002 and finished officially the working program of MSM31 in the afternoon of September 12th. We continued with acquisition of EM122 and PARASOUND data until we reached the slope of the western Barents Sea northwest of Bear Island. Acquisition was finally stopped in the late evening of September 13th.

Additionally, we operated the ADCP 38 kHz and 75 kHz systems to measure currents in the ocean. During acquisition of seismic data recording of the 75kHz system had to be switched off due to interferences with the DOLOG system.

We arrived to Bremerhaven at noon of September 18th, where most of the scientists disembarked. Finally, we arrived to Bremen in the afternoon of September 18th, where cruise MSM31 came to its end.

Acknowledgement

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Participants

Name	Discipline	Institution
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Figures

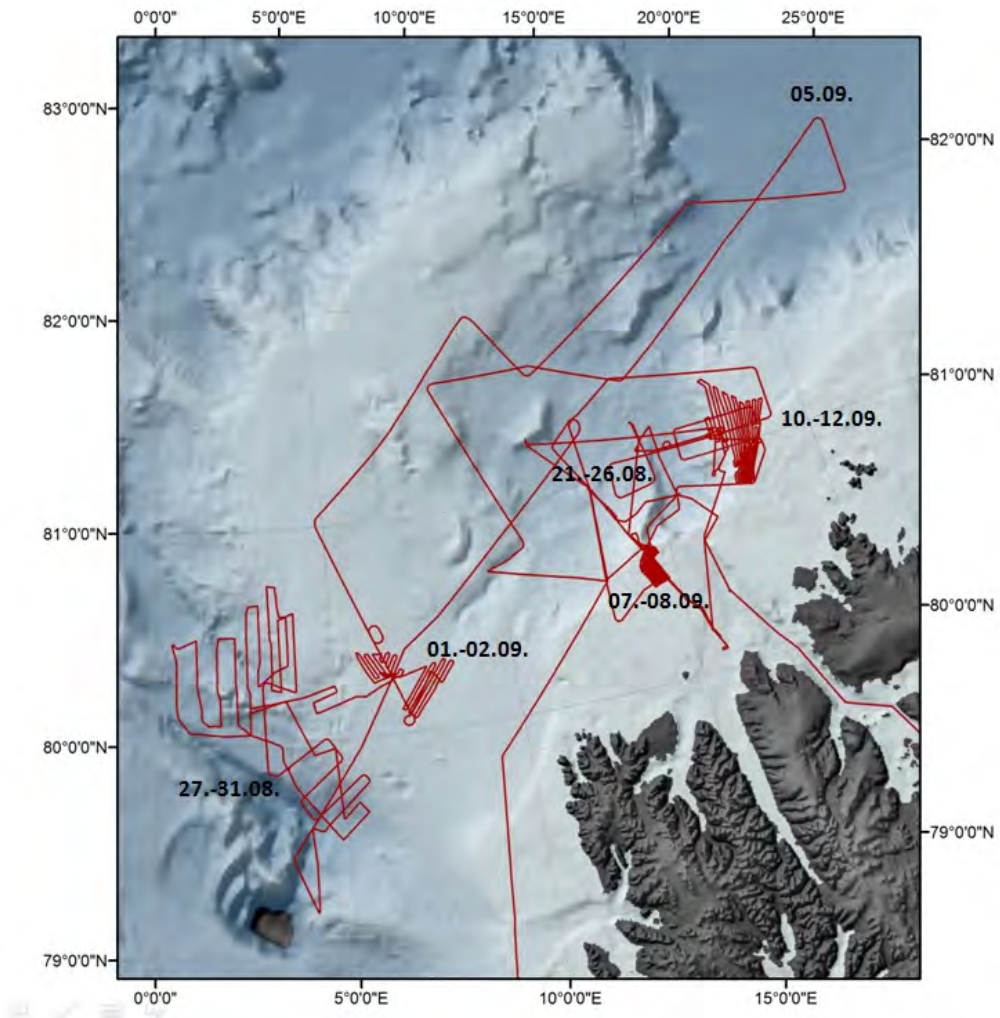


Figure 1 Cruise track.

Station Book for Leg MSM 31

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/530-1	18.08.13	17:53	73° 30.00' N	11° 17.80' E	2077	REL/SVP	at sea surface
MSM31/530-1	18.08.13	18:18	73° 30.00' N	11° 17.80' E	0	REL	at max. depth
MSM31/530-1	18.08.13	18:25	73° 30.00' N	11° 17.81' E	0	REL	information
MSM31/530-1	18.08.13	18:55	73° 30.00' N	11° 17.80' E	0	REL	information
MSM31/530-1	18.08.13	19:19	73° 30.00' N	11° 17.81' E	0	REL	back to deck
MSM31/530-2	18.08.13	19:28	73° 30.00' N	11° 17.81' E	2045	CTD/RO	surface
MSM31/530-2	18.08.13	20:03	73° 30.00' N	11° 17.81' E	0	CTD/RO	at depth
MSM31/530-2	18.08.13	20:37	73° 30.00' N	11° 17.80' E	0	CTD/RO	on deck
MSM31/530-3	18.08.13	20:40	73° 30.00' N	11° 17.80' E	2077	REL	at sea surface
MSM31/530-3	18.08.13	20:50	73° 30.00' N	11° 17.81' E	0	REL	at max. depth
MSM31/530-3	18.08.13	20:55	73° 30.00' N	11° 17.81' E	0	REL	information
MSM31/530-3	18.08.13	21:18	73° 30.00' N	11° 17.80' E	0	REL	information
MSM31/530-3	18.08.13	21:32	73° 30.00' N	11° 17.81' E	2022	REL	back to deck
MSM31/531-1	18.08.13	21:44	73° 30.20' N	11° 17.67' E	2027	MB+PS	start profil
MSM31/531-1	19.08.13	05:41	74° 56.18' N	8° 16.94' E	3452	MB+PS	alter course
MSM31/531-1	19.08.13	08:32	75° 29.62' N	7° 35.65' E	3577	MB+PS	alter course
MSM31/531-1	19.08.13	11:20	76° 4.30' N	7° 43.42' E	2391	MB+PS	alter course
MSM31/531-1	19.08.13	11:52	76° 10.93' N	7° 40.14' E	1835	MB+PS	alter course
MSM31/531-1	19.08.13	13:34	76° 32.03' N	7° 41.81' E	2535	MB+PS	alter course
MSM31/531-1	19.08.13	14:50	76° 46.02' N	8° 6.51' E	2556	MB+PS	alter course
MSM31/531-1	19.08.13	15:45	76° 56.19' N	7° 46.71' E	2574	MB+PS	alter course
MSM31/531-1	19.08.13	21:18	78° 3.86' N	7° 51.46' E	2692	MB+PS	alter course
MSM31/531-1	19.08.13	22:13	78° 12.76' N	8° 29.18' E	1819	MB+PS	alter course
MSM31/531-1	20.08.13	05:52	79° 49.64' N	9° 14.85' E	444	MB+PS	alter course
MSM31/531-1	20.08.13	10:30	80° 31.11' N	12° 54.23' E	711	MB+PS	profile end
MSM31/532-1	20.08.13	10:39	80° 32.00' N	12° 59.00' E	733	BB-OBS	surface
MSM31/533-1	20.08.13	12:58	80° 58.99' N	13° 6.92' E	1939	CTD/RO	surface
MSM31/533-1	20.08.13	13:34	80° 58.99' N	13° 6.92' E	1938	CTD/RO	at depth
MSM31/533-1	20.08.13	14:12	80° 58.99' N	13° 6.91' E	1939	CTD/RO	on deck
MSM31/533-2	20.08.13	14:13	80° 58.99' N	13° 6.91' E	1939	BB-OBS	surface
MSM31/534-1	20.08.13	15:41	80° 49.00' N	13° 38.90' E	1251	BB-OBS	surface
MSM31/535-1	20.08.13	15:50	80° 48.79' N	13° 39.66' E	1225	BB-OBS	surface
MSM31/536-1	20.08.13	16:47	80° 43.00' N	13° 57.04' E	510	BB-OBS	surface
MSM31/537-1	20.08.13	17:37	80° 37.99' N	14° 14.88' E	182	BB-OBS	surface
MSM31/538-1	20.08.13	18:50	80° 29.00' N	14° 41.01' E	128	BB-OBS	surface
MSM31/539-1	20.08.13	19:54	80° 21.99' N	15° 3.82' E	96	BB-OBS	surface
MSM31/540-1	20.08.13	21:16	80° 11.99' N	15° 32.92' E	176	BB-OBS	surface
MSM31/541-1	20.08.13	21:26	80° 12.36' N	15° 33.39' E	177	MB+PS	start profil
MSM31/541-1	21.08.13	00:32	80° 36.45' N	15° 59.86' E	301	MB+PS	alter course
MSM31/541-1	21.08.13	01:30	80° 41.87' N	16° 33.07' E	150	MB+PS	alter course
MSM31/541-1	21.08.13	03:01	80° 48.87' N	15° 58.75' E	1621	MB+PS	alter course
MSM31/541-1	21.08.13	03:51	80° 51.00' N	15° 36.22' E	1891	MB+PS	profile end
MSM31/542-1	21.08.13	03:54	80° 51.00' N	15° 36.16' E	1893	BB-OBS	surface
MSM31/543-1	21.08.13	07:03	81° 9.96' N	15° 5.70' E	2186	SEISREFL	Streamer into water
MSM31/543-1	21.08.13	07:08	81° 9.81' N	15° 4.51' E	2190	SEISREFL	airguns in the water
MSM31/543-1	21.08.13	07:16	81° 9.50' N	15° 2.10' E	2182	SEISREFL	profile start
MSM31/543-1	21.08.13	07:30	81° 8.77' N	14° 56.16' E	2189	SEISREFL	alter course
MSM31/543-1	21.08.13	07:47	81° 7.53' N	14° 51.87' E	2137	SEISREFL	information
MSM31/543-1	21.08.13	07:56	81° 6.98' N	14° 48.72' E	2123	SEISREFL	information
MSM31/543-1	21.08.13	07:56	81° 6.98' N	14° 48.72' E	2123	SEISREFL	end of profile
MSM31/544-1	21.08.13	10:09	81° 4.86' N	16° 54.00' E	947	MB+PS	start profil

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/544-1	21.08.13	10:24	81° 3.52' N	17° 0.83' E	815	MB+PS	alter course
MSM31/544-1	21.08.13	11:15	81° 9.26' N	17° 2.59' E	880	MB+PS	alter course
MSM31/544-1	21.08.13	11:26	81° 9.57' N	17° 7.59' E	836	MB+PS	alter course
MSM31/544-1	21.08.13	12:22	81° 2.94' N	17° 9.29' E	727	MB+PS	alter course
MSM31/544-1	21.08.13	12:38	81° 2.16' N	17° 14.68' E	665	MB+PS	alter course
MSM31/544-1	21.08.13	13:09	81° 5.69' N	17° 17.37' E	688	MB+PS	profile end
MSM31/545-1	21.08.13	13:39	81° 4.91' N	17° 20.40' E	664	SEISREFL	Streamer into water
MSM31/545-1	21.08.13	13:54	81° 4.33' N	17° 21.42' E	646	SEISREFL	airguns in the water
MSM31/545-1	21.08.13	14:45	81° 1.76' N	17° 25.12' E	581	SEISREFL	streamer on deck
MSM31/545-1	21.08.13	16:19	80° 58.82' N	17° 21.38' E	556	SEISREFL	Streamer into water
MSM31/545-1	21.08.13	16:41	80° 58.03' N	17° 18.15' E	559	SEISREFL	profile start
MSM31/545-1	21.08.13	17:46	80° 54.71' N	16° 56.37' E	952	SEISREFL	information
MSM31/545-1	21.08.13	17:50	80° 54.64' N	16° 54.85' E	946	SEISREFL	airgun on deck
MSM31/545-1	21.08.13	18:50	80° 54.02' N	16° 47.08' E	1010	SEISREFL	airguns in the water
MSM31/545-1	21.08.13	19:11	80° 55.30' N	16° 51.84' E	1013	SEISREFL	information
MSM31/545-1	21.08.13	21:10	81° 3.57' N	17° 11.35' E	724	SEISREFL	alter course
MSM31/545-1	21.08.13	23:44	81° 4.25' N	18° 23.17' E	280	SEISREFL	alter course
MSM31/545-1	22.08.13	00:41	81° 7.89' N	18° 30.00' E	349	SEISREFL	alter course
MSM31/545-1	22.08.13	05:47	81° 9.00' N	16° 6.86' E	2104	SEISREFL	alter course
MSM31/545-1	22.08.13	07:40	81° 1.10' N	15° 59.96' E	2084	SEISREFL	alter course
MSM31/545-1	22.08.13	12:44	81° 0.00' N	18° 20.72' E	177	SEISREFL	information
MSM31/545-1	22.08.13	12:50	80° 59.99' N	18° 22.51' E	173	SEISREFL	airgun on deck
MSM31/545-1	22.08.13	13:33	80° 58.38' N	18° 25.02' E	183	SEISREFL	airguns in the water
MSM31/545-1	22.08.13	14:09	80° 58.86' N	18° 28.21' E	179	SEISREFL	information
MSM31/545-1	22.08.13	14:40	80° 56.41' N	18° 28.85' E	159	SEISREFL	alter course
MSM31/545-1	22.08.13	16:33	80° 48.65' N	17° 54.97' E	156	SEISREFL	alter course
MSM31/545-1	22.08.13	18:37	80° 50.19' N	16° 57.81' E	509	SEISREFL	information
MSM31/545-1	22.08.13	21:17	80° 53.10' N	15° 45.16' E	1910	SEISREFL	alter course
MSM31/545-1	22.08.13	21:57	80° 51.03' N	15° 36.05' E	1892	SEISREFL	information
MSM31/545-1	22.08.13	22:42	80° 47.69' N	15° 33.57' E	1796	SEISREFL	alter course
MSM31/545-1	23.08.13	00:34	80° 44.18' N	14° 47.95' E	1089	SEISREFL	alter course
MSM31/545-1	23.08.13	02:25	80° 37.92' N	14° 14.65' E	179	SEISREFL	alter course
MSM31/545-1	23.08.13	02:54	80° 36.15' N	14° 6.66' E	168	SEISREFL	alter course
MSM31/545-1	23.08.13	03:17	80° 34.51' N	14° 2.30' E	158	SEISREFL	alter course
MSM31/545-1	23.08.13	05:15	80° 37.86' N	14° 15.43' E	187	SEISREFL	alter course
MSM31/545-1	23.08.13	06:33	80° 43.24' N	13° 56.19' E	537	SEISREFL	alter course
MSM31/545-1	23.08.13	10:19	81° 0.01' N	14° 33.36' E	1785	SEISREFL	alter course
MSM31/545-1	23.08.13	12:13	81° 7.96' N	14° 52.88' E	2154	SEISREFL	end of profile
MSM31/545-1	23.08.13	12:20	81° 8.27' N	14° 53.68' E	2183	SEISREFL	airgun on deck
MSM31/545-1	23.08.13	12:35	81° 8.88' N	14° 55.20' E	2193	SEISREFL	streamer on deck
MSM31/546-1	23.08.13	13:11	81° 13.33' N	14° 51.82' E	2202	MB+PS	start profil
MSM31/546-1	23.08.13	13:15	81° 13.57' N	14° 50.47' E	2020	MB+PS	alter course
MSM31/546-1	23.08.13	13:20	81° 13.88' N	14° 48.70' E	1732	MB+PS	alter course
MSM31/546-1	23.08.13	13:29	81° 14.24' N	14° 45.66' E	2011	MB+PS	profile end
MSM31/546-2	23.08.13	13:44	81° 13.61' N	14° 50.25' E	1947	DRG	surface
MSM31/546-2	23.08.13	14:47	81° 13.77' N	14° 49.34' E	1748	DRG	start dredging
MSM31/546-2	23.08.13	15:13	81° 13.77' N	14° 49.33' E	1746	DRG	stop dredging
MSM31/546-2	23.08.13	15:45	81° 13.77' N	14° 49.33' E	1746	DRG	on deck
MSM31/547-1	23.08.13	16:34	81° 13.56' N	14° 49.30' E	1983	SEISREFL	Streamer into water
MSM31/547-1	23.08.13	19:41	80° 58.95' N	15° 4.91' E	1728	SEISREFL	airguns in the water
MSM31/547-1	23.08.13	20:27	80° 56.07' N	14° 56.17' E	1456	SEISREFL	profile start
MSM31/547-1	23.08.13	22:12	80° 54.36' N	14° 1.74' E	1510	SEISREFL	alter course

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/547-1	24.08.13	00:09	81° 2.92' N	13° 50.00' E	2006	SEISREFL	alter course
MSM31/547-1	24.08.13	09:38	81° 4.25' N	18° 52.21' E	200	SEISREFL	alter course
MSM31/547-1	24.08.13	12:30	81° 17.89' N	18° 59.97' E	525	SEISREFL	alter course
MSM31/547-1	24.08.13	20:35	81° 27.55' N	14° 34.22' E	2431	SEISREFL	information
MSM31/547-1	24.08.13	23:54	81° 18.11' N	12° 58.81' E	2276	SEISREFL	alter course
MSM31/547-1	25.08.13	03:39	80° 59.10' N	13° 6.81' E	1939	SEISREFL	alter course
MSM31/547-1	25.08.13	09:01	80° 32.09' N	12° 59.08' E	728	SEISREFL	alter course
MSM31/547-1	25.08.13	11:02	80° 21.84' N	12° 59.54' E	114	SEISREFL	alter course
MSM31/547-1	25.08.13	13:28	80° 27.26' N	13° 56.33' E	125	SEISREFL	alter course
MSM31/547-1	25.08.13	14:36	80° 29.58' N	14° 30.50' E	134	SEISREFL	alter course
MSM31/547-1	25.08.13	23:52	81° 11.80' N	12° 18.38' E	2160	SEISREFL	information
MSM31/547-1	26.08.13	01:47	81° 18.66' N	12° 57.94' E	2271	SEISREFL	alter course
MSM31/547-1	26.08.13	10:33	80° 50.37' N	10° 10.83' E	1071	SEISREFL	alter course
MSM31/547-1	26.08.13	15:54	80° 31.57' N	8° 5.90' E	883	SEISREFL	alter course
MSM31/547-1	26.08.13	18:33	80° 23.46' N	7° 0.76' E	649	SEISREFL	alter course
MSM31/547-1	26.08.13	20:16	80° 16.00' N	6° 35.82' E	555	SEISREFL	alter course
MSM31/547-1	27.08.13	00:32	79° 57.65' N	5° 34.07' E	1004	SEISREFL	alter course
MSM31/547-1	27.08.13	07:52	79° 28.05' N	3° 35.00' E	3026	SEISREFL	end of profile
MSM31/547-1	27.08.13	08:08	79° 26.94' N	3° 34.38' E	2861	SEISREFL	airgun on deck
MSM31/547-1	27.08.13	12:36	79° 12.00' N	4° 5.18' E	2251	SEISREFL	streamer on deck
MSM31/548-1	27.08.13	15:32	79° 35.31' N	4° 10.05' E	4016	SEISREFL	Streamer into water
MSM31/548-1	27.08.13	15:49	79° 35.04' N	4° 13.83' E	4000	SEISREFL	airguns in the water
MSM31/548-1	27.08.13	16:37	79° 35.62' N	4° 27.87' E	3210	SEISREFL	profile start
MSM31/548-1	27.08.13	20:26	79° 46.98' N	5° 38.01' E	1277	SEISREFL	alter course
MSM31/548-1	27.08.13	20:56	79° 48.95' N	5° 36.35' E	1207	SEISREFL	alter course
MSM31/548-1	28.08.13	01:08	79° 38.32' N	4° 14.28' E	3660	SEISREFL	alter course
MSM31/548-1	28.08.13	02:37	79° 42.63' N	3° 50.95' E	3555	SEISREFL	alter course
MSM31/548-1	28.08.13	06:26	79° 53.89' N	4° 58.11' E	1356	SEISREFL	alter course
MSM31/548-1	28.08.13	08:15	80° 0.46' N	4° 36.85' E	1282	SEISREFL	alter course
MSM31/548-1	28.08.13	12:02	79° 51.17' N	3° 16.83' E	2556	SEISREFL	alter course
MSM31/548-1	28.08.13	12:32	79° 51.44' N	3° 4.89' E	2700	SEISREFL	alter course
MSM31/548-1	28.08.13	18:01	80° 15.97' N	2° 58.48' E	1383	SEISREFL	end of profile
MSM31/548-1	28.08.13	18:08	80° 16.43' N	2° 59.16' E	1376	SEISREFL	airgun on deck
MSM31/548-1	28.08.13	18:24	80° 17.16' N	3° 1.61' E	1363	SEISREFL	streamer on deck
MSM31/549-1	28.08.13	19:33	80° 14.72' N	3° 53.93' E	1143	MB+PS	start profil
MSM31/549-1	28.08.13	22:14	80° 35.98' N	3° 56.47' E	900	MB+PS	alter course
MSM31/549-1	28.08.13	22:50	80° 34.77' N	3° 31.24' E	1083	MB+PS	alter course
MSM31/549-1	29.08.13	01:22	80° 14.76' N	3° 29.21' E	1262	MB+PS	alter course
MSM31/549-1	29.08.13	01:45	80° 15.26' N	3° 13.61' E	1318	MB+PS	alter course
MSM31/549-1	29.08.13	05:31	80° 44.27' N	3° 14.31' E	1005	MB+PS	alter course
MSM31/549-1	29.08.13	05:48	80° 44.02' N	3° 27.06' E	939	MB+PS	alter course
MSM31/549-1	29.08.13	08:23	80° 22.32' N	3° 42.85' E	1071	MB+PS	profile end
MSM31/550-1	29.08.13	09:10	80° 19.87' N	3° 15.67' E	1268	MUC	surface
MSM31/550-1	29.08.13	09:33	80° 19.88' N	3° 15.63' E	1272	MUC	at sea bottom
MSM31/550-1	29.08.13	10:19	80° 19.88' N	3° 15.64' E	1271	MUC	on deck
MSM31/550-2	29.08.13	10:27	80° 19.87' N	3° 15.65' E	1269	CTD/RO	surface
MSM31/550-2	29.08.13	10:56	80° 19.88' N	3° 15.64' E	1269	CTD/RO	at depth
MSM31/550-2	29.08.13	11:27	80° 19.87' N	3° 15.66' E	1270	CTD/RO	on deck
MSM31/550-3	29.08.13	11:34	80° 19.87' N	3° 15.66' E	1269	GC	surface
MSM31/550-3	29.08.13	11:57	80° 19.87' N	3° 15.66' E	1268	GC	at sea bottom
MSM31/550-3	29.08.13	11:58	80° 19.87' N	3° 15.66' E	1287	GC	off ground hoisting
MSM31/550-3	29.08.13	12:19	80° 19.87' N	3° 15.65' E	1271	GC	on deck
MSM31/550-4	29.08.13	12:46	80° 19.87' N	3° 15.66' E	1268	MUC	surface

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/550-4	29.08.13	13:09	80° 19.87' N	3° 15.65' E	1272	MUC	at sea bottom
MSM31/550-4	29.08.13	13:30	80° 19.87' N	3° 15.64' E	1271	MUC	on deck
MSM31/550-5	29.08.13	13:38	80° 19.87' N	3° 15.63' E	1275	GKG	surface
MSM31/550-5	29.08.13	14:01	80° 19.87' N	3° 15.65' E	1274	GKG	at sea bottom
MSM31/550-5	29.08.13	14:20	80° 19.87' N	3° 15.64' E	1274	GKG	on deck
MSM31/550-6	29.08.13	14:46	80° 19.87' N	3° 15.64' E	1273	GC	surface
MSM31/550-6	29.08.13	15:05	80° 19.88' N	3° 15.61' E	1272	GC	at sea bottom
MSM31/550-6	29.08.13	15:07	80° 19.87' N	3° 15.65' E	1273	GC	off ground hoisting
MSM31/550-6	29.08.13	15:30	80° 19.88' N	3° 15.64' E	1272	GC	on deck
MSM31/550-7	29.08.13	15:37	80° 19.88' N	3° 15.64' E	1274	MUC	surface
MSM31/550-7	29.08.13	15:59	80° 19.87' N	3° 15.63' E	1273	MUC	at sea bottom
MSM31/550-7	29.08.13	16:50	80° 19.88' N	3° 15.63' E	1279	MUC	on deck
MSM31/551-1	29.08.13	17:47	80° 16.49' N	2° 51.60' E	1410	MB+PS	start profil
MSM31/551-1	29.08.13	20:44	80° 39.12' N	2° 56.55' E	1302	MB+PS	alter course
MSM31/551-1	29.08.13	21:04	80° 38.92' N	2° 41.10' E	1440	MB+PS	alter course
MSM31/551-1	30.08.13	00:51	80° 9.26' N	2° 36.74' E	1910	MB+PS	alter course
MSM31/551-1	30.08.13	02:03	80° 11.53' N	3° 29.23' E	1452	MB+PS	alter course
MSM31/551-1	30.08.13	04:20	79° 56.21' N	4° 16.33' E	1992	MB+PS	alter course
MSM31/551-1	30.08.13	05:05	79° 57.50' N	4° 48.96' E	1297	MB+PS	alter course
MSM31/551-1	30.08.13	07:36	79° 37.79' N	4° 55.77' E	2850	MB+PS	alter course
MSM31/551-1	30.08.13	08:25	79° 41.80' N	5° 20.95' E	2019	MB+PS	alter course
MSM31/551-1	30.08.13	08:53	79° 39.16' N	5° 34.77' E	1904	MB+PS	alter course
MSM31/551-1	30.08.13	10:13	79° 32.00' N	4° 52.56' E	2843	MB+PS	alter course
MSM31/551-1	30.08.13	12:40	79° 46.93' N	3° 45.88' E	2810	MB+PS	alter course
MSM31/551-1	30.08.13	13:12	79° 50.82' N	3° 36.43' E	2460	MB+PS	profile end
MSM31/552-1	30.08.13	13:35	79° 52.91' N	3° 31.44' E	2440	GC	surface
MSM31/552-1	30.08.13	14:08	79° 52.92' N	3° 31.48' E	2442	GC	at sea bottom
MSM31/552-1	30.08.13	14:10	79° 52.92' N	3° 31.48' E	2439	GC	off ground hoisting
MSM31/552-1	30.08.13	14:45	79° 52.92' N	3° 31.48' E	2441	GC	on deck
MSM31/552-2	30.08.13	15:29	79° 52.92' N	3° 31.48' E	2440	GC	surface
MSM31/552-2	30.08.13	15:59	79° 52.92' N	3° 31.48' E	2440	GC	at sea bottom
MSM31/552-2	30.08.13	16:00	79° 52.92' N	3° 31.48' E	2439	GC	off ground hoisting
MSM31/552-2	30.08.13	16:35	79° 52.92' N	3° 31.48' E	2442	GC	on deck
MSM31/553-1	30.08.13	17:06	79° 53.25' N	3° 34.32' E	2425	GC	surface
MSM31/553-1	30.08.13	17:38	79° 53.25' N	3° 34.33' E	2422	GC	at sea bottom
MSM31/553-1	30.08.13	17:39	79° 53.25' N	3° 34.33' E	2424	GC	off ground hoisting
MSM31/553-1	30.08.13	18:14	79° 53.25' N	3° 34.32' E	2422	GC	on deck
MSM31/554-1	30.08.13	18:37	79° 53.04' N	3° 31.22' E	2444	MB+PS	start profil
MSM31/554-1	30.08.13	18:55	79° 55.07' N	3° 26.04' E	2432	MB+PS	alter course
MSM31/554-1	30.08.13	19:18	79° 58.08' N	3° 25.91' E	2356	MB+PS	alter course
MSM31/554-1	30.08.13	20:34	80° 2.63' N	2° 36.61' E	2570	MB+PS	alter course
MSM31/554-1	30.08.13	20:45	80° 3.61' N	2° 30.68' E	2569	MB+PS	alter course
MSM31/554-1	30.08.13	20:45	80° 3.61' N	2° 30.68' E	2569	MB+PS	alter course
MSM31/554-1	31.08.13	00:16	80° 30.22' N	2° 13.89' E	2100	MB+PS	alter course
MSM31/554-1	31.08.13	00:48	80° 30.30' N	1° 48.07' E	2624	MB+PS	alter course
MSM31/554-1	31.08.13	03:55	80° 5.81' N	1° 47.49' E	2742	MB+PS	alter course
MSM31/554-1	31.08.13	04:22	80° 5.58' N	1° 27.72' E	2860	MB+PS	alter course
MSM31/554-1	31.08.13	05:16	80° 11.67' N	1° 14.79' E	2831	MB+PS	alter course
MSM31/554-1	31.08.13	05:59	80° 17.26' N	1° 9.41' E	2429	MB+PS	alter course
MSM31/554-1	31.08.13	07:33	80° 29.71' N	1° 9.07' E	2959	MB+PS	alter course
MSM31/554-1	31.08.13	08:17	80° 27.63' N	0° 37.08' E	2881	MB+PS	profile break
MSM31/554-1	31.08.13	08:50	80° 27.24' N	0° 29.69' E	3072	MB+PS	continue the profile
MSM31/554-1	31.08.13	09:12	80° 24.43' N	0° 34.28' E	2487	MB+PS	alter course

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/554-1	31.08.13	11:49	80° 3.67' N	0° 56.96' E	3429	MB+PS	alter course
MSM31/554-1	31.08.13	13:42	80° 2.71' N	2° 34.04' E	2572	MB+PS	alter course
MSM31/554-1	31.08.13	14:44	80° 10.40' N	2° 40.57' E	1787	MB+PS	profile end
MSM31/555-1	31.08.13	15:49	80° 12.37' N	4° 2.84' E	1214	MB+PS	start profil
MSM31/555-1	31.08.13	17:02	80° 15.06' N	4° 57.15' E	832	MB+PS	alter course
MSM31/555-1	31.08.13	17:14	80° 13.65' N	5° 1.10' E	838	MB+PS	alter course
MSM31/555-1	31.08.13	18:10	80° 10.97' N	4° 21.47' E	1165	MB+PS	alter course
MSM31/555-1	31.08.13	18:33	80° 8.02' N	4° 24.05' E	1209	MB+PS	profile end
MSM31/556-1	31.08.13	20:10	80° 13.67' N	6° 14.01' E	569	MB+PS	start profil
MSM31/556-1	31.08.13	20:39	80° 15.09' N	6° 34.87' E	567	MB+PS	alter course
MSM31/556-1	31.08.13	20:42	80° 15.41' N	6° 35.45' E	559	MB+PS	alter course
MSM31/556-1	31.08.13	20:44	80° 15.68' N	6° 35.38' E	557	MB+PS	alter course
MSM31/556-1	31.08.13	20:55	80° 17.14' N	6° 34.76' E	569	MB+PS	alter course
MSM31/556-1	31.08.13	20:57	80° 17.41' N	6° 34.59' E	560	MB+PS	alter course
MSM31/556-1	31.08.13	21:32	80° 21.58' N	6° 46.33' E	592	MB+PS	alter course
MSM31/556-1	31.08.13	22:06	80° 19.19' N	6° 31.76' E	561	MB+PS	alter course
MSM31/556-1	31.08.13	22:44	80° 22.26' N	6° 34.10' E	594	MB+PS	alter course
MSM31/556-1	31.08.13	23:15	80° 20.54' N	6° 21.68' E	568	MB+PS	alter course
MSM31/556-1	31.08.13	23:24	80° 21.16' N	6° 17.82' E	565	MB+PS	alter course
MSM31/556-1	31.08.13	23:37	80° 22.73' N	6° 21.22' E	568	MB+PS	alter course
MSM31/556-1	31.08.13	23:56	80° 22.99' N	6° 7.52' E	568	MB+PS	alter course
MSM31/556-1	01.09.13	00:47	80° 16.92' N	6° 26.08' E	558	MB+PS	alter course
MSM31/556-1	01.09.13	01:50	80° 22.83' N	5° 58.62' E	568	MB+PS	alter course
MSM31/556-1	01.09.13	02:52	80° 16.36' N	6° 12.91' E	567	MB+PS	alter course
MSM31/556-1	01.09.13	03:00	80° 16.09' N	6° 6.87' E	576	MB+PS	alter course
MSM31/556-1	01.09.13	03:59	80° 23.38' N	5° 43.78' E	575	MB+PS	alter course
MSM31/556-1	01.09.13	04:06	80° 23.85' N	5° 38.97' E	577	MB+PS	alter course
MSM31/556-1	01.09.13	05:18	80° 15.05' N	6° 3.61' E	573	MB+PS	alter course
MSM31/556-1	01.09.13	07:00	80° 15.54' N	6° 36.26' E	561	MB+PS	profile end
MSM31/557-1	01.09.13	07:23	80° 15.52' N	6° 35.75' E	560	CTD/RO	surface
MSM31/557-1	01.09.13	07:39	80° 15.52' N	6° 35.75' E	561	CTD/RO	at depth
MSM31/557-1	01.09.13	07:57	80° 15.52' N	6° 35.76' E	560	CTD/RO	on deck
MSM31/557-2	01.09.13	08:02	80° 15.52' N	6° 35.75' E	560	MUC	surface
MSM31/557-2	01.09.13	08:18	80° 15.52' N	6° 35.75' E	560	MUC	at sea bottom
MSM31/557-2	01.09.13	08:32	80° 15.52' N	6° 35.75' E	561	MUC	on deck
MSM31/557-3	01.09.13	08:38	80° 15.52' N	6° 35.75' E	560	GKG	surface
MSM31/557-3	01.09.13	08:50	80° 15.52' N	6° 35.75' E	560	GKG	at sea bottom
MSM31/557-3	01.09.13	09:05	80° 15.52' N	6° 35.75' E	560	GKG	on deck
MSM31/557-4	01.09.13	09:15	80° 15.52' N	6° 35.75' E	561	GC	surface
MSM31/557-4	01.09.13	09:27	80° 15.52' N	6° 35.75' E	561	GC	at sea bottom
MSM31/557-4	01.09.13	09:43	80° 15.52' N	6° 35.75' E	561	GC	on deck
MSM31/558-1	01.09.13	10:05	80° 16.04' N	6° 36.02' E	562	MB+PS	start profil
MSM31/558-1	01.09.13	10:09	80° 16.22' N	6° 33.72' E	563	MB+PS	alter course
MSM31/558-1	01.09.13	10:22	80° 16.96' N	6° 26.45' E	560	MB+PS	alter course
MSM31/558-1	01.09.13	10:25	80° 17.13' N	6° 24.68' E	566	MB+PS	alter course
MSM31/558-1	01.09.13	10:32	80° 17.44' N	6° 20.33' E	560	MB+PS	alter course
MSM31/558-1	01.09.13	10:36	80° 17.47' N	6° 17.79' E	564	MB+PS	alter course
MSM31/558-1	01.09.13	10:40	80° 17.47' N	6° 15.05' E	560	MB+PS	alter course
MSM31/558-1	01.09.13	11:19	80° 16.08' N	6° 35.31' E	574	MB+PS	profile end
MSM31/559-1	01.09.13	11:21	80° 16.08' N	6° 35.24' E	574	GC	surface
MSM31/559-1	01.09.13	11:34	80° 16.08' N	6° 35.22' E	573	GC	at sea bottom
MSM31/559-1	01.09.13	11:36	80° 16.08' N	6° 35.22' E	575	GC	off ground hoisting
MSM31/559-1	01.09.13	11:51	80° 16.08' N	6° 35.21' E	572	GC	on deck

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/560-1	01.09.13	12:21	80° 17.04' N	6° 25.74' E	582	GC	surface
MSM31/560-1	01.09.13	12:36	80° 17.04' N	6° 25.71' E	580	GC	at sea bottom
MSM31/560-1	01.09.13	12:37	80° 17.04' N	6° 25.71' E	581	GC	off ground hoisting
MSM31/560-1	01.09.13	12:54	80° 17.04' N	6° 25.72' E	581	GC	on deck
MSM31/561-1	01.09.13	13:24	80° 17.44' N	6° 17.10' E	565	GC	surface
MSM31/561-1	01.09.13	13:37	80° 17.44' N	6° 17.10' E	565	GC	at sea bottom
MSM31/561-1	01.09.13	13:37	80° 17.44' N	6° 17.10' E	565	GC	off ground hoisting
MSM31/561-1	01.09.13	13:53	80° 17.44' N	6° 17.10' E	566	GC	on deck
MSM31/561-2	01.09.13	13:57	80° 17.44' N	6° 17.10' E	565	GKG	surface
MSM31/561-2	01.09.13	14:09	80° 17.44' N	6° 17.10' E	564	GKG	at sea bottom
MSM31/561-2	01.09.13	14:24	80° 17.44' N	6° 17.10' E	564	GKG	on deck
MSM31/561-3	01.09.13	14:34	80° 17.44' N	6° 17.10' E	565	MUC	surface
MSM31/561-3	01.09.13	14:43	80° 17.44' N	6° 17.10' E	565	MUC	at sea bottom
MSM31/561-3	01.09.13	14:56	80° 17.44' N	6° 17.10' E	565	MUC	on deck
MSM31/562-1	01.09.13	16:09	80° 17.73' N	7° 33.62' E	635	MB+PS	start profil
MSM31/562-1	01.09.13	17:50	80° 6.98' N	6° 47.40' E	571	MB+PS	alter course
MSM31/562-1	01.09.13	17:57	80° 6.39' N	6° 50.05' E	579	MB+PS	alter course
MSM31/562-1	01.09.13	19:49	80° 18.23' N	7° 42.54' E	640	MB+PS	alter course
MSM31/562-1	01.09.13	21:57	80° 5.91' N	6° 56.31' E	557	MB+PS	alter course
MSM31/562-1	02.09.13	00:17	80° 19.07' N	8° 0.90' E	668	MB+PS	alter course
MSM31/562-1	02.09.13	02:38	80° 4.71' N	7° 4.49' E	552	MB+PS	alter course
MSM31/562-1	02.09.13	05:01	80° 18.36' N	8° 12.79' E	655	MB+PS	alter course
MSM31/562-1	02.09.13	06:00	80° 13.13' N	7° 57.99' E	587	MB+PS	profile end
MSM31/563-1	02.09.13	06:48	80° 15.55' N	7° 36.88' E	618	SEISREFL	Streamer into water
MSM31/563-1	02.09.13	09:17	80° 5.88' N	7° 1.62' E	541	SEISREFL	airguns in the water
MSM31/563-1	02.09.13	11:37	80° 5.94' N	6° 57.21' E	549	SEISREFL	profile start
MSM31/563-1	02.09.13	13:37	80° 15.79' N	6° 35.67' E	558	SEISREFL	alter course
MSM31/563-1	02.09.13	16:21	80° 29.18' N	6° 4.18' E	605	SEISREFL	information
MSM31/563-1	02.09.13	17:34	80° 27.99' N	6° 26.17' E	626	SEISREFL	alter course
MSM31/563-1	02.09.13	18:28	80° 26.93' N	6° 9.27' E	592	SEISREFL	information
MSM31/563-1	03.09.13	01:16	80° 59.73' N	4° 48.68' E	671	SEISREFL	alter course
MSM31/563-1	03.09.13	01:38	81° 1.56' N	4° 48.00' E	672	SEISREFL	information
MSM31/563-1	03.09.13	15:33	81° 53.01' N	10° 11.88' E	964	SEISREFL	alter course
MSM31/563-1	03.09.13	20:23	81° 34.48' N	11° 51.32' E	1997	SEISREFL	alter course
MSM31/563-1	04.09.13	09:39	82° 8.53' N	18° 31.56' E	2409	SEISREFL	alter course
MSM31/563-1	04.09.13	17:59	81° 56.30' N	23° 36.66' E	3602	SEISREFL	alter course
MSM31/563-1	04.09.13	21:56	82° 16.34' N	24° 2.77' E	3892	SEISREFL	alter course
MSM31/563-2	04.09.13	22:35	82° 17.72' N	23° 44.76' E	3887	SWS	Satrt
MSM31/563-2	04.09.13	22:39	82° 17.53' N	23° 42.46' E	3886	SWS	End
MSM31/563-1	05.09.13	06:47	81° 55.05' N	19° 20.59' E	3476	SEISREFL	alter course
MSM31/563-1	05.09.13	13:32	81° 34.05' N	16° 6.48' E	2584	SEISREFL	alter course
MSM31/563-1	05.09.13	16:01	81° 26.63' N	14° 56.50' E	2411	SEISREFL	alter course
MSM31/563-1	05.09.13	21:19	81° 36.27' N	12° 6.94' E	2003	SEISREFL	alter course
MSM31/563-1	06.09.13	02:30	81° 36.40' N	8° 56.77' E	999	SEISREFL	alter course
MSM31/563-1	06.09.13	12:56	80° 48.49' N	10° 50.64' E	1383	SEISREFL	end of profile
MSM31/563-1	06.09.13	13:45	80° 45.87' N	10° 41.65' E	1484	SEISREFL	airgun on deck
MSM31/563-1	06.09.13	16:37	80° 41.86' N	9° 44.29' E	1169	SEISREFL	streamer on deck
MSM31/564-1	06.09.13	19:29	80° 32.26' N	12° 59.91' E	739	BB-OBS	hydrophone into water
MSM31/564-1	06.09.13	19:34	80° 32.26' N	12° 59.90' E	733	BB-OBS	released
MSM31/564-1	06.09.13	19:35	80° 32.26' N	12° 59.90' E	733	BB-OBS	hydrophone back to deck
MSM31/564-1	06.09.13	20:01	80° 32.37' N	13° 0.69' E	735	BB-OBS	on deck
MSM31/565-1	06.09.13	20:02	80° 32.38' N	13° 0.69' E	731	EM1002	start of profile
MSM31/565-1	06.09.13	22:01	80° 39.47' N	14° 18.61' E	177	EM1002	end of profile

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/566-1	06.09.13	22:14	80° 38.95' N	14° 17.92' E	180	SEISREFR	Airguns out
MSM31/566-1	06.09.13	22:31	80° 38.02' N	14° 15.28' E	178	SEISREFR	start profile
MSM31/566-1	07.09.13	00:35	80° 29.04' N	14° 40.90' E	123	SEISREFR	alter course
MSM31/566-1	07.09.13	02:13	80° 22.17' N	15° 3.28' E	102	SEISREFR	alter course
MSM31/566-1	07.09.13	03:13	80° 18.50' N	15° 21.66' E	74	SEISREFR	alter course
MSM31/566-1	07.09.13	04:36	80° 12.22' N	15° 32.53' E	185	SEISREFR	alter course
MSM31/566-1	07.09.13	05:55	80° 6.50' N	15° 47.90' E	220	SEISREFR	end profile
MSM31/566-1	07.09.13	06:29	80° 5.56' N	15° 42.20' E	202	SEISREFR	Airguns on deck
MSM31/567-1	07.09.13	06:48	80° 6.39' N	15° 46.83' E	216	EM1002	start of profile
MSM31/567-1	07.09.13	07:50	80° 11.98' N	15° 34.34' E	163	EM1002	interruption of profile
MSM31/568-1	07.09.13	07:53	80° 11.98' N	15° 34.31' E	164	BB-OBS	hydrophone into water
MSM31/568-1	07.09.13	07:57	80° 11.98' N	15° 34.31' E	161	BB-OBS	released
MSM31/568-1	07.09.13	07:57	80° 11.98' N	15° 34.31' E	161	BB-OBS	hydrophone back to deck
MSM31/568-1	07.09.13	08:08	80° 11.88' N	15° 33.05' E	170	BB-OBS	on deck
MSM31/567-1	07.09.13	08:17	80° 11.91' N	15° 33.93' E	166	EM1002	continuation of profile
MSM31/567-1	07.09.13	09:07	80° 17.88' N	15° 24.58' E	83	EM1002	change of course
MSM31/567-1	07.09.13	09:42	80° 21.47' N	15° 7.19' E	86	EM1002	interruption of profile
MSM31/569-1	07.09.13	09:50	80° 21.99' N	15° 5.16' E	97	BB-OBS	hydrophone into water
MSM31/569-1	07.09.13	09:52	80° 21.99' N	15° 5.15' E	103	BB-OBS	released
MSM31/569-1	07.09.13	09:53	80° 21.99' N	15° 5.15' E	103	BB-OBS	sighted
MSM31/569-1	07.09.13	09:54	80° 21.99' N	15° 5.15' E	92	BB-OBS	hydrophone back to deck
MSM31/569-1	07.09.13	10:02	80° 21.94' N	15° 3.55' E	89	BB-OBS	on deck
MSM31/567-1	07.09.13	10:14	80° 22.04' N	15° 5.31' E	101	EM1002	continuation of profile
MSM31/567-1	07.09.13	11:14	80° 28.88' N	14° 43.13' E	120	EM1002	interruption of profile
MSM31/570-1	07.09.13	11:19	80° 29.07' N	14° 42.37' E	122	BB-OBS	hydrophone into water
MSM31/570-1	07.09.13	11:20	80° 29.07' N	14° 42.38' E	129	BB-OBS	released
MSM31/570-1	07.09.13	11:22	80° 29.07' N	14° 42.39' E	129	BB-OBS	hydrophone back to deck
MSM31/570-1	07.09.13	11:23	80° 29.07' N	14° 42.39' E	119	BB-OBS	sighted
MSM31/570-1	07.09.13	11:33	80° 29.00' N	14° 40.73' E	125	BB-OBS	on deck
MSM31/567-1	07.09.13	11:41	80° 28.91' N	14° 42.53' E	120	EM1002	continuation of profile
MSM31/567-1	07.09.13	12:55	80° 37.70' N	14° 17.55' E	176	EM1002	interruption of profile
MSM31/571-1	07.09.13	13:03	80° 38.03' N	14° 16.87' E	183	CTD/RO	surface
MSM31/571-1	07.09.13	13:11	80° 38.03' N	14° 16.87' E	177	CTD/RO	at depth
MSM31/572-1	07.09.13	13:18	80° 38.03' N	14° 16.88' E	179	BB-OBS	hydrophone into water
MSM31/571-1	07.09.13	13:18	80° 38.03' N	14° 16.88' E	179	CTD/RO	on deck
MSM31/572-1	07.09.13	13:20	80° 38.03' N	14° 16.88' E	177	BB-OBS	released
MSM31/572-1	07.09.13	13:21	80° 38.03' N	14° 16.88' E	183	BB-OBS	hydrophone back to deck
MSM31/572-1	07.09.13	13:22	80° 38.03' N	14° 16.88' E	183	BB-OBS	sighted
MSM31/572-1	07.09.13	13:33	80° 38.07' N	14° 15.61' E	178	BB-OBS	on deck
MSM31/567-1	07.09.13	13:46	80° 37.76' N	14° 17.49' E	176	EM1002	continuation of profile
MSM31/567-1	07.09.13	14:32	80° 42.90' N	14° 0.16' E	437	EM1002	end of profile
MSM31/573-1	07.09.13	14:38	80° 43.04' N	13° 58.66' E	491	BB-OBS	hydrophone into water
MSM31/573-1	07.09.13	14:41	80° 43.04' N	13° 58.67' E	491	BB-OBS	released
MSM31/573-1	07.09.13	14:42	80° 43.04' N	13° 58.66' E	491	BB-OBS	hydrophone back to deck
MSM31/573-1	07.09.13	14:48	80° 43.04' N	13° 58.67' E	491	BB-OBS	sighted
MSM31/573-1	07.09.13	14:59	80° 43.32' N	14° 0.13' E	506	BB-OBS	on deck
MSM31/574-1	07.09.13	15:14	80° 43.68' N	14° 7.66' E	442	MB+PS	start profil
MSM31/574-1	07.09.13	15:44	80° 40.07' N	14° 13.34' E	184	MB+PS	alter course
MSM31/574-1	07.09.13	16:10	80° 38.61' N	14° 32.59' E	171	MB+PS	alter course
MSM31/574-1	07.09.13	16:25	80° 36.88' N	14° 37.60' E	149	MB+PS	alter course
MSM31/574-1	07.09.13	16:28	80° 36.64' N	14° 36.61' E	147	MB+PS	alter course
MSM31/574-1	07.09.13	16:43	80° 38.13' N	14° 31.23' E	171	MB+PS	alter course
MSM31/574-1	07.09.13	16:47	80° 38.36' N	14° 29.00' E	172	MB+PS	alter course

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/574-1	07.09.13	17:04	80° 36.46' N	14° 33.20' E	155	MB+PS	alter course
MSM31/574-1	07.09.13	17:08	80° 36.21' N	14° 31.55' E	158	MB+PS	alter course
MSM31/574-1	07.09.13	17:31	80° 38.89' N	14° 23.44' E	173	MB+PS	alter course
MSM31/574-1	07.09.13	17:36	80° 39.17' N	14° 20.08' E	177	MB+PS	alter course
MSM31/574-1	07.09.13	18:04	80° 36.05' N	14° 29.07' E	159	MB+PS	alter course
MSM31/574-1	07.09.13	18:31	80° 38.33' N	14° 19.92' E	178	MB+PS	alter course
MSM31/574-1	07.09.13	18:43	80° 37.27' N	14° 14.79' E	178	MB+PS	alter course
MSM31/574-1	07.09.13	19:51	80° 29.23' N	14° 38.52' E	136	MB+PS	alter course
MSM31/574-1	07.09.13	20:59	80° 36.37' N	14° 12.54' E	170	MB+PS	alter course
MSM31/574-1	07.09.13	22:06	80° 28.98' N	14° 33.97' E	148	MB+PS	alter course
MSM31/574-1	07.09.13	23:09	80° 35.48' N	14° 8.72' E	160	MB+PS	alter course
MSM31/574-1	08.09.13	00:11	80° 28.82' N	14° 29.36' E	136	MB+PS	alter course
MSM31/574-1	08.09.13	01:08	80° 34.34' N	14° 5.67' E	160	MB+PS	alter course
MSM31/574-1	08.09.13	02:03	80° 28.54' N	14° 24.68' E	119	MB+PS	alter course
MSM31/574-1	08.09.13	02:53	80° 33.42' N	14° 3.57' E	161	MB+PS	alter course
MSM31/574-1	08.09.13	03:44	80° 28.11' N	14° 19.70' E	110	MB+PS	alter course
MSM31/574-1	08.09.13	04:06	80° 29.97' N	14° 11.97' E	127	MB+PS	alter course
MSM31/574-1	08.09.13	04:41	80° 27.72' N	14° 17.81' E	101	MB+PS	alter course
MSM31/574-1	08.09.13	05:16	80° 28.88' N	14° 44.43' E	140	MB+PS	alter course
MSM31/574-1	08.09.13	06:26	80° 37.07' N	14° 20.65' E	173	MB+PS	profile end
MSM31/575-1	08.09.13	08:22	80° 35.74' N	14° 27.17' E	168	CTD/RO	surface
MSM31/575-1	08.09.13	08:31	80° 35.74' N	14° 27.17' E	167	CTD/RO	at depth
MSM31/575-1	08.09.13	08:41	80° 35.74' N	14° 27.17' E	168	CTD/RO	on deck
MSM31/575-2	08.09.13	08:47	80° 35.74' N	14° 27.17' E	169	MUC	surface
MSM31/575-2	08.09.13	08:54	80° 35.74' N	14° 27.17' E	173	MUC	at sea bottom
MSM31/575-2	08.09.13	09:01	80° 35.74' N	14° 27.17' E	168	MUC	on deck
MSM31/575-3	08.09.13	09:06	80° 35.74' N	14° 27.17' E	167	GKG	surface
MSM31/575-3	08.09.13	09:11	80° 35.74' N	14° 27.17' E	168	GKG	at sea bottom
MSM31/575-3	08.09.13	09:22	80° 35.74' N	14° 27.17' E	168	GKG	on deck
MSM31/575-4	08.09.13	09:29	80° 35.74' N	14° 27.17' E	168	GC	surface
MSM31/575-4	08.09.13	09:35	80° 35.74' N	14° 27.17' E	168	GC	at sea bottom
MSM31/575-4	08.09.13	09:37	80° 35.74' N	14° 27.17' E	168	GC	off ground hoisting
MSM31/575-4	08.09.13	09:45	80° 35.74' N	14° 27.17' E	169	GC	on deck
MSM31/575-5	08.09.13	09:58	80° 35.74' N	14° 27.17' E	167	CTD/RO	surface
MSM31/575-5	08.09.13	10:10	80° 35.74' N	14° 27.17' E	169	CTD/RO	at depth
MSM31/575-5	08.09.13	10:17	80° 35.74' N	14° 27.17' E	168	CTD/RO	on deck
MSM31/576-1	08.09.13	12:16	80° 51.01' N	15° 33.42' E	1915	BB-OBS	hydrophone into water
MSM31/576-1	08.09.13	12:22	80° 51.01' N	15° 33.42' E	0	BB-OBS	released
MSM31/576-1	08.09.13	12:23	80° 51.00' N	15° 33.42' E	0	BB-OBS	hydrophone back to deck
MSM31/576-1	08.09.13	12:49	80° 51.01' N	15° 33.42' E	0	BB-OBS	sighted
MSM31/576-1	08.09.13	13:09	80° 51.12' N	15° 40.48' E	1906	BB-OBS	on deck
MSM31/577-1	08.09.13	15:07	80° 48.84' N	13° 38.54' E	1244	BB-OBS	hydrophone into water
MSM31/577-1	08.09.13	15:13	80° 48.84' N	13° 38.54' E	0	BB-OBS	released
MSM31/577-1	08.09.13	15:14	80° 48.84' N	13° 38.54' E	0	BB-OBS	hydrophone back to deck
MSM31/577-1	08.09.13	15:32	80° 48.79' N	13° 38.54' E	0	BB-OBS	sighted
MSM31/577-1	08.09.13	15:42	80° 49.04' N	13° 41.42' E	0	BB-OBS	on deck
MSM31/578-1	08.09.13	15:47	80° 49.05' N	13° 40.39' E	0	BB-OBS	hydrophone into water
MSM31/578-1	08.09.13	15:51	80° 49.08' N	13° 40.30' E	0	BB-OBS	released
MSM31/578-1	08.09.13	15:52	80° 49.08' N	13° 40.27' E	0	BB-OBS	hydrophone back to deck
MSM31/578-1	08.09.13	16:10	80° 49.01' N	13° 37.79' E	0	BB-OBS	sighted
MSM31/578-1	08.09.13	16:25	80° 49.27' N	13° 40.85' E	1259	BB-OBS	on deck
MSM31/579-1	08.09.13	17:31	80° 59.09' N	13° 4.01' E	1957	BB-OBS	hydrophone into water
MSM31/579-1	08.09.13	17:36	80° 59.09' N	13° 4.01' E	0	BB-OBS	released

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/579-1	08.09.13	17:49	80° 59.09' N	13° 4.00' E	0	BB-OBS	hydrophone back to deck
MSM31/579-1	08.09.13	18:05	80° 59.09' N	13° 4.01' E	0	BB-OBS	sighted
MSM31/579-1	08.09.13	18:17	80° 59.07' N	13° 6.90' E	0	BB-OBS	on deck
MSM31/580-1	08.09.13	19:58	81° 14.22' N	11° 33.62' E	1997	MB+PS	start profil
MSM31/580-1	08.09.13	20:13	81° 16.07' N	11° 30.09' E	1363	MB+PS	profile end
MSM31/581-1	08.09.13	20:35	81° 14.49' N	11° 32.90' E	1954	DRG	surface
MSM31/581-1	08.09.13	21:58	81° 15.09' N	11° 31.90' E	1527	DRG	start dredging
MSM31/581-1	08.09.13	23:00	81° 15.10' N	11° 31.53' E	1515	DRG	information
MSM31/581-1	09.09.13	03:20	81° 14.56' N	11° 32.31' E	1913	DRG	information
MSM31/581-1	09.09.13	03:47	81° 14.56' N	11° 32.31' E	1912	DRG	on deck
MSM31/582-1	09.09.13	08:27	81° 6.45' N	17° 15.96' E	709	MB+PS	start profil
MSM31/582-1	09.09.13	09:50	81° 18.01' N	17° 20.35' E	719	MB+PS	alter course
MSM31/582-1	09.09.13	10:07	81° 19.82' N	17° 10.44' E	836	MB+PS	alter course
MSM31/582-1	09.09.13	10:15	81° 20.35' N	17° 14.71' E	826	MB+PS	alter course
MSM31/582-1	09.09.13	10:35	81° 18.47' N	17° 27.42' E	703	MB+PS	alter course
MSM31/582-1	09.09.13	12:33	81° 1.93' N	17° 23.18' E	605	MB+PS	profile break
MSM31/583-1	09.09.13	12:40	81° 1.72' N	17° 22.25' E	604	CTD/RO	surface
MSM31/583-1	09.09.13	12:58	81° 1.72' N	17° 22.27' E	603	CTD/RO	at depth
MSM31/583-1	09.09.13	13:17	81° 1.73' N	17° 22.28' E	603	CTD/RO	on deck
MSM31/582-1	09.09.13	13:23	81° 1.86' N	17° 22.78' E	599	MB+PS	continue the profile
MSM31/582-1	09.09.13	13:30	81° 1.58' N	17° 27.97' E	566	MB+PS	alter course
MSM31/582-1	09.09.13	15:22	81° 17.06' N	17° 34.24' E	640	MB+PS	alter course
MSM31/582-1	09.09.13	17:59	80° 56.06' N	17° 33.24' E	382	MB+PS	alter course
MSM31/582-1	09.09.13	18:04	80° 55.73' N	17° 30.19' E	393	MB+PS	alter course
MSM31/582-1	09.09.13	18:15	80° 54.23' N	17° 28.31' E	360	MB+PS	alter course
MSM31/582-1	09.09.13	18:19	80° 53.89' N	17° 29.85' E	290	MB+PS	alter course
MSM31/582-1	09.09.13	18:29	80° 54.90' N	17° 32.38' E	342	MB+PS	alter course
MSM31/582-1	09.09.13	18:34	80° 55.31' N	17° 35.04' E	312	MB+PS	alter course
MSM31/582-1	09.09.13	20:57	81° 15.14' N	17° 47.16' E	570	MB+PS	alter course
MSM31/582-1	09.09.13	21:09	81° 14.06' N	17° 54.06' E	512	MB+PS	alter course
MSM31/582-1	09.09.13	23:27	80° 54.96' N	17° 39.09' E	205	MB+PS	alter course
MSM31/582-1	09.09.13	23:30	80° 54.85' N	17° 36.54' E	237	MB+PS	alter course
MSM31/582-1	09.09.13	23:49	80° 54.60' N	17° 38.44' E	205	MB+PS	alter course
MSM31/582-1	10.09.13	00:00	80° 53.64' N	17° 40.42' E	214	MB+PS	alter course
MSM31/582-1	10.09.13	02:26	81° 13.27' N	18° 2.57' E	492	MB+PS	alter course
MSM31/582-1	10.09.13	04:50	80° 53.74' N	17° 43.66' E	213	MB+PS	alter course
MSM31/582-1	10.09.13	07:02	81° 10.90' N	18° 12.00' E	445	MB+PS	alter course
MSM31/582-1	10.09.13	07:12	81° 10.02' N	18° 17.49' E	398	MB+PS	alter course
MSM31/582-1	10.09.13	08:28	80° 59.52' N	18° 4.15' E	246	MB+PS	alter course
MSM31/582-1	10.09.13	09:54	81° 10.30' N	18° 23.69' E	397	MB+PS	alter course
MSM31/582-1	10.09.13	10:00	81° 10.49' N	18° 27.56' E	397	MB+PS	alter course
MSM31/582-1	10.09.13	10:43	81° 4.95' N	18° 19.96' E	306	MB+PS	alter course
MSM31/582-1	10.09.13	10:48	81° 4.75' N	18° 22.70' E	302	MB+PS	alter course
MSM31/582-1	10.09.13	11:25	81° 6.86' N	18° 28.03' E	342	MB+PS	Information
MSM31/582-1	10.09.13	11:55	81° 10.16' N	18° 35.36' E	388	MB+PS	alter course
MSM31/582-1	10.09.13	12:01	81° 10.30' N	18° 39.74' E	396	MB+PS	alter course
MSM31/582-1	10.09.13	12:44	81° 4.92' N	18° 28.44' E	285	MB+PS	alter course
MSM31/582-1	10.09.13	12:48	81° 4.75' N	18° 30.34' E	282	MB+PS	alter course
MSM31/582-1	10.09.13	13:30	81° 9.89' N	18° 46.69' E	385	MB+PS	alter course
MSM31/582-1	10.09.13	13:36	81° 10.12' N	18° 50.87' E	376	MB+PS	alter course
MSM31/582-1	10.09.13	14:21	81° 4.74' N	18° 36.36' E	280	MB+PS	profile end
MSM31/584-1	10.09.13	14:31	81° 3.38' N	18° 35.59' E	255	MB+PS	start profil
MSM31/584-1	10.09.13	14:56	81° 0.16' N	18° 26.07' E	184	MB+PS	alter course

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/584-1	10.09.13	15:27	81° 3.38' N	18° 35.63' E	254	MB+PS	alter course
MSM31/584-1	10.09.13	15:46	81° 3.65' N	18° 20.45' E	277	MB+PS	alter course
MSM31/584-1	10.09.13	16:22	80° 58.96' N	18° 11.07' E	190	MB+PS	alter course
MSM31/584-1	10.09.13	16:29	80° 58.95' N	18° 6.07' E	197	MB+PS	alter course
MSM31/584-1	10.09.13	16:54	80° 56.10' N	17° 53.59' E	207	MB+PS	alter course
MSM31/584-1	10.09.13	17:14	80° 53.41' N	17° 48.29' E	169	MB+PS	alter course
MSM31/584-1	10.09.13	17:30	80° 53.31' N	17° 35.16' E	195	MB+PS	alter course
MSM31/584-1	10.09.13	17:34	80° 52.99' N	17° 33.91' E	200	MB+PS	alter course
MSM31/584-1	10.09.13	17:45	80° 52.22' N	17° 26.08' E	216	MB+PS	alter course
MSM31/584-1	10.09.13	18:03	80° 49.86' N	17° 23.01' E	198	MB+PS	alter course
MSM31/584-1	10.09.13	18:08	80° 49.52' N	17° 25.38' E	192	MB+PS	alter course
MSM31/584-1	10.09.13	18:24	80° 51.58' N	17° 28.72' E	228	MB+PS	alter course
MSM31/584-1	10.09.13	18:29	80° 52.04' N	17° 31.54' E	253	MB+PS	alter course
MSM31/584-1	10.09.13	18:37	80° 51.42' N	17° 32.24' E	196	MB+PS	alter course
MSM31/584-1	10.09.13	18:51	80° 49.48' N	17° 30.52' E	184	MB+PS	alter course
MSM31/584-1	10.09.13	18:55	80° 49.21' N	17° 32.36' E	157	MB+PS	alter course
MSM31/584-1	10.09.13	19:20	80° 52.65' N	17° 37.13' E	200	MB+PS	alter course
MSM31/584-1	10.09.13	19:24	80° 52.84' N	17° 39.43' E	179	MB+PS	alter course
MSM31/584-1	10.09.13	19:52	80° 49.26' N	17° 36.64' E	139	MB+PS	alter course
MSM31/584-1	10.09.13	19:55	80° 49.03' N	17° 37.75' E	134	MB+PS	alter course
MSM31/584-1	10.09.13	20:21	80° 52.52' N	17° 43.67' E	170	MB+PS	alter course
MSM31/584-1	10.09.13	20:24	80° 52.70' N	17° 45.22' E	171	MB+PS	alter course
MSM31/584-1	10.09.13	20:53	80° 48.98' N	17° 41.66' E	130	MB+PS	alter course
MSM31/584-1	10.09.13	20:55	80° 48.82' N	17° 42.36' E	117	MB+PS	alter course
MSM31/584-1	10.09.13	21:22	80° 52.43' N	17° 49.09' E	179	MB+PS	alter course
MSM31/584-1	10.09.13	21:45	80° 55.49' N	17° 55.40' E	191	MB+PS	alter course
MSM31/584-1	10.09.13	22:07	80° 58.16' N	18° 5.19' E	221	MB+PS	alter course
MSM31/584-1	10.09.13	22:11	80° 58.29' N	18° 7.84' E	193	MB+PS	alter course
MSM31/584-1	10.09.13	22:35	80° 55.61' N	17° 59.63' E	190	MB+PS	alter course
MSM31/584-1	10.09.13	22:58	80° 52.61' N	17° 52.30' E	158	MB+PS	alter course
MSM31/584-1	10.09.13	23:25	80° 48.92' N	17° 46.46' E	108	MB+PS	alter course
MSM31/584-1	10.09.13	23:56	80° 52.23' N	17° 54.28' E	166	MB+PS	alter course
MSM31/584-1	11.09.13	00:14	80° 54.57' N	18° 0.30' E	185	MB+PS	alter course
MSM31/584-1	11.09.13	00:44	80° 58.29' N	18° 13.03' E	181	MB+PS	alter course
MSM31/584-1	11.09.13	01:17	81° 2.64' N	18° 23.16' E	277	MB+PS	alter course
MSM31/584-1	11.09.13	01:23	81° 2.80' N	18° 27.04' E	268	MB+PS	alter course
MSM31/584-1	11.09.13	01:58	80° 58.59' N	18° 17.56' E	184	MB+PS	alter course
MSM31/584-1	11.09.13	02:24	80° 55.40' N	18° 6.59' E	178	MB+PS	alter course
MSM31/584-1	11.09.13	02:47	80° 52.47' N	17° 57.58' E	150	MB+PS	alter course
MSM31/584-1	11.09.13	03:11	80° 49.16' N	17° 51.79' E	132	MB+PS	alter course
MSM31/584-1	11.09.13	03:38	80° 51.94' N	17° 58.68' E	151	MB+PS	alter course
MSM31/584-1	11.09.13	04:31	80° 58.51' N	18° 21.23' E	192	MB+PS	profile end
MSM31/585-1	11.09.13	06:10	81° 3.64' N	17° 1.64' E	819	CTD/RO	surface
MSM31/585-1	11.09.13	06:32	81° 3.64' N	17° 1.63' E	817	CTD/RO	at depth
MSM31/585-1	11.09.13	06:53	81° 3.64' N	17° 1.63' E	817	CTD/RO	on deck
MSM31/585-2	11.09.13	06:57	81° 3.64' N	17° 1.63' E	816	MUC	surface
MSM31/585-2	11.09.13	07:15	81° 3.64' N	17° 1.64' E	816	MUC	at sea bottom
MSM31/585-2	11.09.13	07:32	81° 3.64' N	17° 1.64' E	814	MUC	on deck
MSM31/585-3	11.09.13	07:39	81° 3.64' N	17° 1.64' E	819	GC	surface
MSM31/585-3	11.09.13	07:54	81° 3.64' N	17° 1.63' E	817	GC	at sea bottom
MSM31/585-3	11.09.13	07:54	81° 3.64' N	17° 1.63' E	817	GC	off ground hoisting
MSM31/585-3	11.09.13	08:14	81° 3.64' N	17° 1.63' E	818	GC	on deck
MSM31/585-4	11.09.13	08:17	81° 3.64' N	17° 1.64' E	816	GKG	surface

Station No.	Date	Time [UTC]	Position Lat	Position Lon	Depth [m]	Gear Abbreviation	Action
MSM31/585-4	11.09.13	08:33	81° 3.64' N	17° 1.64' E	813	GKG	at sea bottom
MSM31/585-4	11.09.13	08:49	81° 3.64' N	17° 1.63' E	814	GKG	on deck
MSM31/585-5	11.09.13	08:56	81° 3.64' N	17° 1.64' E	817	GC	surface
MSM31/585-5	11.09.13	09:11	81° 3.64' N	17° 1.63' E	812	GC	at sea bottom
MSM31/585-5	11.09.13	09:12	81° 3.64' N	17° 1.64' E	815	GC	off ground hoisting
MSM31/585-5	11.09.13	09:32	81° 3.64' N	17° 1.63' E	812	GC	on deck
MSM31/586-1	11.09.13	10:48	81° 5.07' N	17° 2.77' E	836	SEISREFL	Streamer into water
MSM31/586-1	11.09.13	11:00	81° 5.09' N	17° 6.21' E	804	SEISREFL	airguns in the water
MSM31/586-1	11.09.13	12:31	81° 4.17' N	17° 17.54' E	675	SEISREFL	profile start
MSM31/586-1	11.09.13	15:23	81° 4.21' N	15° 54.89' E	2190	SEISREFL	alter course
MSM31/586-1	11.09.13	15:23	81° 4.21' N	15° 54.89' E	2190	SEISREFL	Profile brake
MSM31/586-1	11.09.13	15:31	81° 4.33' N	15° 51.72' E	2189	SEISREFL	airgun on deck
MSM31/586-1	11.09.13	16:04	81° 6.11' N	15° 46.17' E	2171	SEISREFL	airguns in the water
MSM31/586-1	11.09.13	17:25	81° 4.22' N	15° 54.19' E	2194	SEISREFL	Continue profile
MSM31/586-1	11.09.13	20:11	81° 4.22' N	17° 13.94' E	716	SEISREFL	alter course
MSM31/586-1	11.09.13	21:37	80° 58.47' N	17° 18.21' E	570	SEISREFL	alter course
MSM31/586-1	11.09.13	22:30	80° 55.46' N	17° 2.54' E	913	SEISREFL	end of profile
MSM31/586-1	11.09.13	22:59	80° 53.80' N	17° 4.19' E	738	SEISREFL	airgun on deck
MSM31/586-1	11.09.13	23:11	80° 53.59' N	17° 7.32' E	569	SEISREFL	streamer on deck
MSM31/587-1	12.09.13	03:28	80° 21.35' N	16° 17.92' E	406	GC	surface
MSM31/587-1	12.09.13	03:37	80° 21.35' N	16° 17.92' E	406	GC	at sea bottom
MSM31/587-1	12.09.13	03:37	80° 21.35' N	16° 17.92' E	406	GC	off ground hoisting
MSM31/587-1	12.09.13	03:52	80° 21.35' N	16° 17.93' E	406	GC	on deck
MSM31/588-1	12.09.13	06:00	80° 6.12' N	17° 12.46' E	382	EM1002	start of profile
MSM31/588-1	12.09.13	06:48	80° 0.00' N	17° 37.94' E	393	EM1002	change of course
MSM31/588-1	12.09.13	08:52	79° 41.64' N	18° 22.18' E	423	EM1002	change of course
MSM31/588-1	12.09.13	10:13	79° 36.14' N	19° 28.29' E	270	EM1002	change of course
MSM31/588-1	12.09.13	11:22	79° 26.84' N	19° 55.25' E	129	EM1002	change of course
MSM31/588-1	12.09.13	12:00	79° 22.91' N	20° 18.29' E	111	EM1002	change of course
MSM31/588-1	12.09.13	12:10	79° 21.84' N	20° 24.66' E	101	EM1002	change of course
MSM31/588-1	12.09.13	13:05	79° 15.54' N	20° 56.26' E	77	EM1002	change of course
MSM31/588-1	12.09.13	15:30	78° 57.57' N	22° 3.18' E	117	EM1002	end of profile

BB-OBS, broadband ocean-bottom seismometer
 CTD/RO, CTD/rosette water sampler
 DRG, dredge
 EM1002, shallow water multibeam echosounder
 GC, gravity corer
 GKG, large box corer
 MB, multibeam swath bathymetry
 MUC, multi corer
 PS, PARASOUND sub-bottom profiler
 REL, BB-OBS releaser test
 SEISREFL, multichannel reflection seismic profile
 SEISREFR, seismic refraction profile
 SVP, sound velocity profile tool
 SWS, surface water sample