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Short Cruise Report
RV SONNE – SO242/1
Guayaquil – Guayaquil
28.07.2015 – 25.08.2015
Chief Scientist: Prof. Dr. Jens Greinert
Captain: Oliver Meyer



Cruise Track

Cruise SO242-1 worked in the DISCOL area in the Peru Basin. The central study area, the DISCOL Experimental Area (DAE), covered only a circle of 2nmi in diameter. Because of this we show three maps for displaying the cruise track in the working area in addition to the overview map in Figure 1.

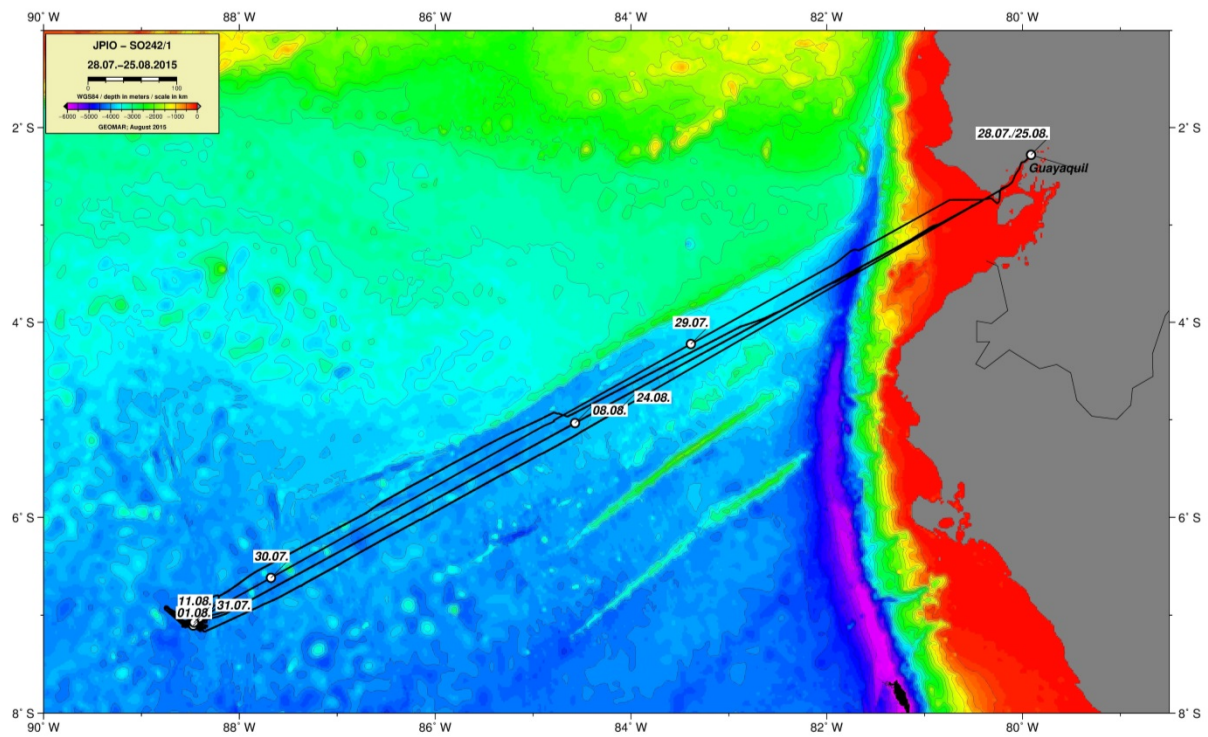


Figure 1: Cruise track of SO242/1.

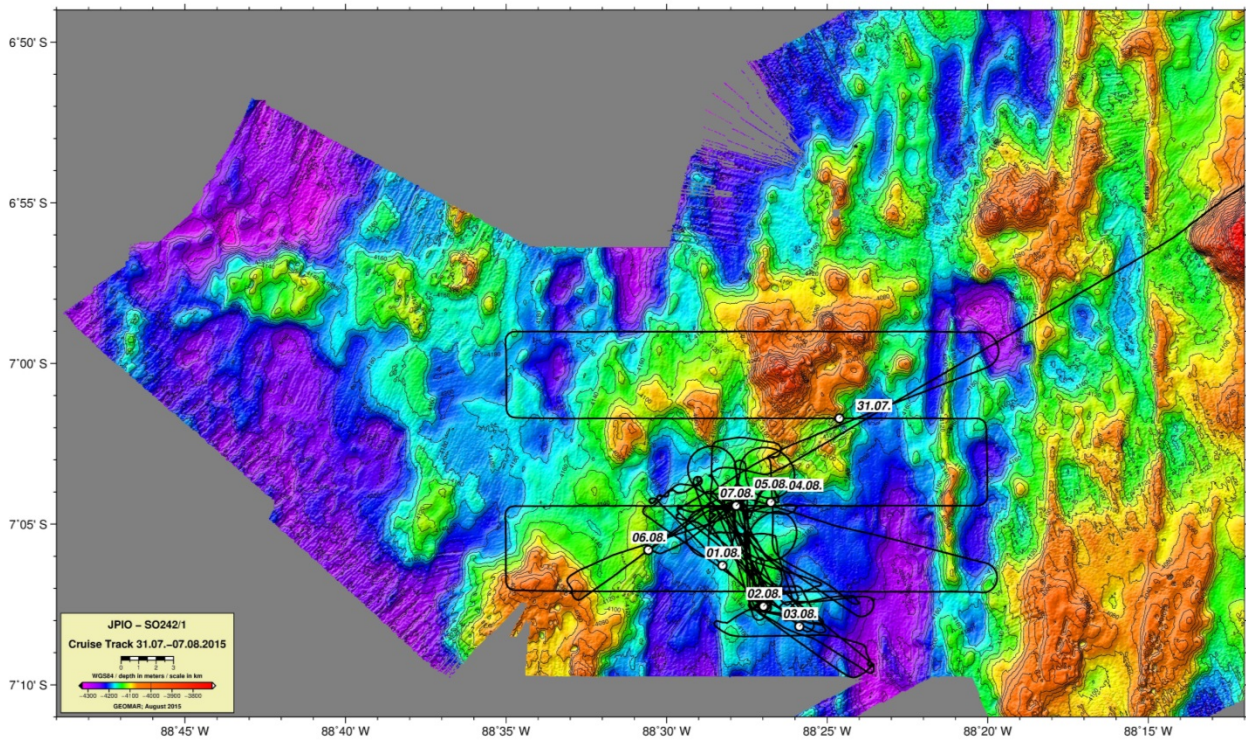


Figure 2: Cruise track from 30th July to 7th August 2015, SO242/1

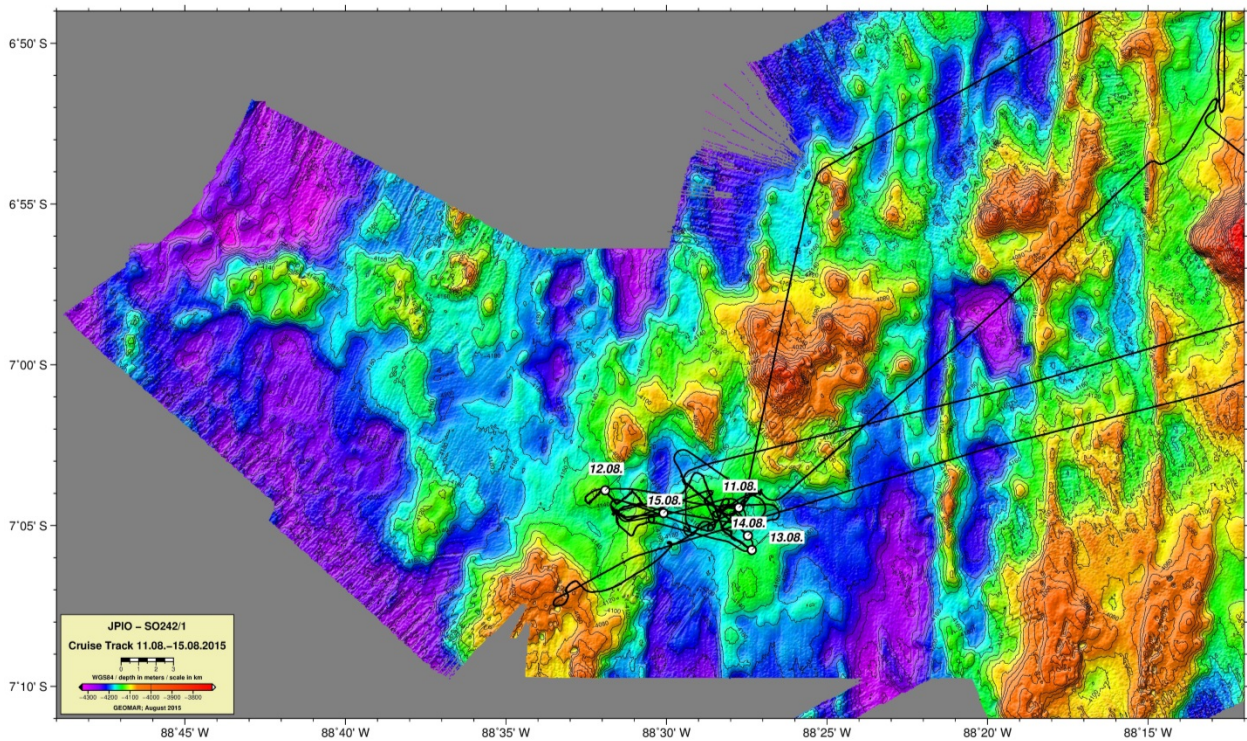


Figure 3: Cruise track from 8th August to 16th August 2015, SO242/1

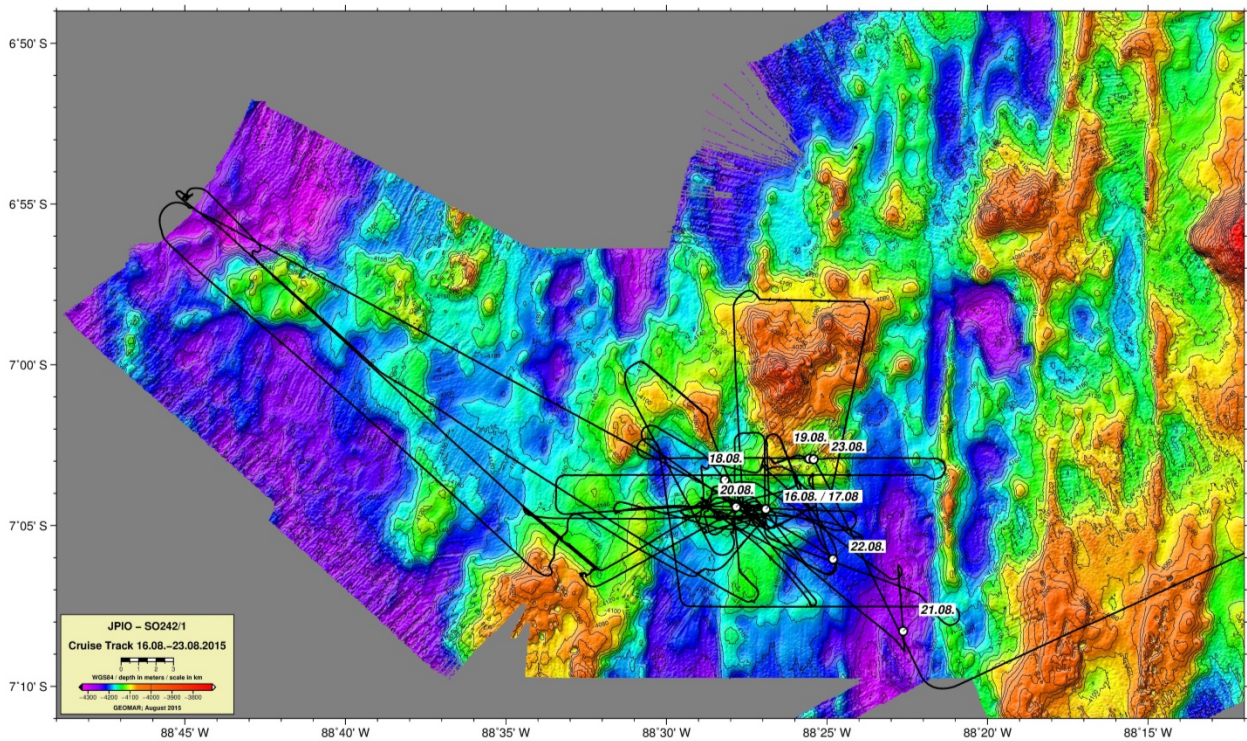


Figure 4: Cruise track from 8th August to 16th August 2015, SO242/1

Objectives

Cruise SO242 aimed to re-study the DISCOL Experimental Area (DEA), in which a plough experiment had been performed during SO61 in 1989 to simulate the impact of Mn-nodule deep sea mining. This area was investigated repeatedly between 1989 and 1997 during several cruises with RV SONNE (SO, 64, 70, 106) to study the impact of a mechanical disturbance of the seafloor and to evaluate the degree of recolonisation

and recovery of the seep sea environment. The main objective of SO242 was to re-investigate the area for getting another data set in time. With SO242, 26 years after the initial cruise, the DISCOL area is the longest deep sea environment study of a man-made disturbance.

The main objective of the first leg of SO242 was to re-map – both visually and acoustically –and to re-sample the seafloor (inside and outside the plough marks) and the water column for biological, geochemical and oceanographic studies. We employed the latest technology to be able to execute sampling and mapping in as much detail as is possible, which nowadays makes another scale of resolution possible.

The most important objective of the seafloor mapping was to completely map the original DEA area with AUV-based multibeam, sidescan and photo mosaicking in high resolution to ensure detailed insight into the current state of the environment and to acquire well georeferenced data enabling comparisons to data acquired before. The exact locations of the old plough tracks from the initial disturbance in 1989 were of particular interest. Sidescan and multibeam data allowed the AUV to navigate between 7 and 3.5m altitude for subsequent photo surveys with the objective of determining the changes in macro-fauna abundance and plough mark recolonization. Knowing the exact location of plough marks and the impact they still have was a precondition to be able to plan biological and geochemical sampling during SO242/1 and SO242/2 in the best possible manner. Biological samples with video-guided multicorer, box corer, epibenthic sledge and amphipod-traps were taken to investigate the ecosystem recovery compared to the last study in 1996. In addition to taxonomic studies and abundance measurements, the biological samples will also be investigated using state-of-the-art genetic fingerprinting technologies. The distribution of macro-fauna was also investigated during visual OFOS-based stations. Geochemical samples from gravity and multi corer deployments aimed at learning more about the geochemical conditions (in particular oxygen penetration depth) inside and outside the plough marks and ‘plume’-covered areas and at study changes in comparison to previous analyses from 1996. Oceanographic studies involving lander-based CTD, ADCP and thermistor mooring measurements aimed at better characterizing the physical environment of the deep sea and in particular at deriving data that could be used for a small-scale disturbance experiment using the epi benthic sled as plume-generating tool.

To study spatial differences and at the same time allow comparisons, a total of five sampling locations was targeted: two locations inside the disturbed area, where sampling occurred at heavily and less disturbed areas close to earlier sampling locations, and two reference sites with Mn-nodules and one without Mn-nodules that were studied before.

Narrative

Leg 1 of RV SONNE cruise 242 started in Guayaquil (Ecuador) on 28th July 2015 and arrived in the working area on 30th July. During transit, a first CTD cast was carried out just outside the 200nmi area to acquire a sound velocity profile for multibeam data recording on the way to DEA. The scientific program started on 30th July with the deployment of 4 LBL moorings for the AUV underwater navigation; two of these moorings were also equipped with MAPRs. In between these four deployments, the DOS Lander and the amphipod trap were deployed for the first time inside the DEA. After a calibration survey for the exact LBL-transponder location the BoBo lander and the thermistor mooring were deployed next to the southern reference sites. The AUV was deployed and during its sidescan survey the ship’s EM 122 multibeam system was used to map the DISCOL area in high resolution providing detailed information for further planning biological and geochemical sampling (Fig.1-3). Sampling commenced in the southern reference area with video-guided multicorer and box corer deployments. The sampling scheme for each site originally comprised five box corer (BC) and video-guided multicorer (TV-MUC) deployments and two epibenthic sledge tracks (EBS). Sampling by TV-MUC, GC, EBS and BC was planned in an alternating fashion depending on the analytical capacities of ship-based labs and in accordance with AUV operations and Amphipod-Trap deployments.

During the first six deployments, the TV-MUC run via the A-frame at the stern using the fiber optical cable. This was done to make alternating deployments of GC/BC with TV-MUC possible, which were deployed over the side using the Geo-wire. Unfortunately, it turned out that the ship's heave at the stern caused malfunctions of and did not allow sediment recovery because the MUC already closed in the water column. Thus the sampling scheme was changed so that all gear (BC, GC and TV-MUC) was run in sequence from the starboard side of the ship; only the cable had to be changed from a steel wire (GC and BC) to a fiber-optical cable when the TV-MUC and later the Ocean Floor Observatory System (OFOS) were used. Sampling of the southern reference area - the undisturbed reference site without Mn-nodules - was completed on 5th August with the last successful deployment of a TV-MUC. During the sampling periods, the AUV was deployed to use the time for mapping the DEA with sidescan sonar and multibeam.

The DOS lander and the Amphipod Trap were recovered and deployed again in the southern reference area and south of the larger DISCOL area, respectively. Additionally, a first dive with OFOS was performed. The next sampling site was a heavily disturbed area with Mn-nodules within the inner circle of the DEA. Sampling was successful including five BC, five TV-MUC and one GC deployments. During that time, the AUV continued its multibeam mapping of designated areas within the DEA. The Amphipod Trap was deployed for the third time south of the western reference area and the BoBo lander was successfully deployed inside the DEA in preparation for a small-scale disturbance and sediment plume distribution experiment using the EBS as 'disturber'. After the recovery of TV-MUC 16 and the Amphipod Trap, the scientific program had to be interrupted due to a medical incident that could not be treated on the ship. During the transit (7-11 August) back to and from Guayaquil the seafloor was mapped using the ship's multibeam system adding a track north and south of the first transit line, respectively.

SONNE arrived back in the study area on 11th August and scientific work was resumed with the fourth Amphipod Trap deployment about 40 km northeast of the DEA. Sampling of the heavily disturbed site was completed and an additional TV-MUC was deployed at the so-called "Black Patch", a slight depression within the DEA identified from sidescan sonar images, which later turned out to be free of Mn-nodules. The DOS lander was recovered and re-deployed close to the location of the BoBo lander in anticipation of the small-scale disturbance experiment with the EBS.

On 12th August, BC and TV-MUC sampling shifted to the western reference site after the second OFOS track was surveyed along a track from this new reference site across the DEA area following plough marks. The AUV performed photo surveys of the heavily disturbed area and other parts of the DEA for photo mosaicking repeatedly. Following the two previous, successful EBS deployments NW of the DEA, the third deployment was designed as a small-scale disturbance experiment and the EBS was towed close to the positions of the DOS and the BoBo lander at the western edge of the DEA to gain insights into the development and the evolution of the created sediment plume, particularly using data of the three ADCPs attached to the two landers. Immediately after the EBS, a CTD was deployed to monitor the immediate effects of the disturbance in the water column. Staying in the DEA, a GC recovered sediment at one "Black Patch" and another two EBS were run successfully inside (without USBL navigation) and northwest of the DEA. After the 15th BC deployment, sampling was completed at the western reference site on the 15th August and was resumed at the eastern disturbed site inside the DEA with BC 16. The DOS and the BoBo landers were successfully deployed to be picked up during the next leg (SO242-2), another GC was taken inside the DEA and the Amphipod Trap was deployed for the last time 40km NW of the DEA. Two more OFOS runs were executed, one inside the DEA and one at the seamount that was chosen after inspection of the multibeam data collected by the AUV. In addition to that, the ship's sub-bottom profiler was used northwest of the DEA in order to choose a suitable site for geochemical sampling (BC 26 and GC 7) in one of the small depressions of the pillow basalt-prone seamount. After completing the work at another heavily disturbed area in the western area of the DEA, TV-MUC and GC sampling was resumed at the eastern reference site (undisturbed, without nodules), while BC sampling was repeated inside the heavily disturbed

area to acquire more samples from within the old plough marks. Alternating to that, another three EBS runs were successfully executed, in the western reference area as well as north and southwest of the DISCOL area. Sediment sampling was concluded after the last GC and three of the four LBL devices were recovered. The SE transponders failed to release and the device was left to be picked up during the second leg of cruise SO242. The transponder could be recovered during SO242-2; it turned out both glass flotation spheres had imploded. Station work ended after two more OFOS tracks, one starting inside the DEA and going eastwards into none nodule terrain. The final OFOS surveyed different lithological features in the “mountain area” northeast of the DEA. These features were detected in AUV sidescan and multibeam data showing again black patches and pillow basalt outcrops. On 23rd August at roughly 7:30am, all station work in the DISCOL was completed and SONNE left the area and arrived back in Guayaquil on 25th August. During transit another multibeam line was added south of the three previous transit lines.

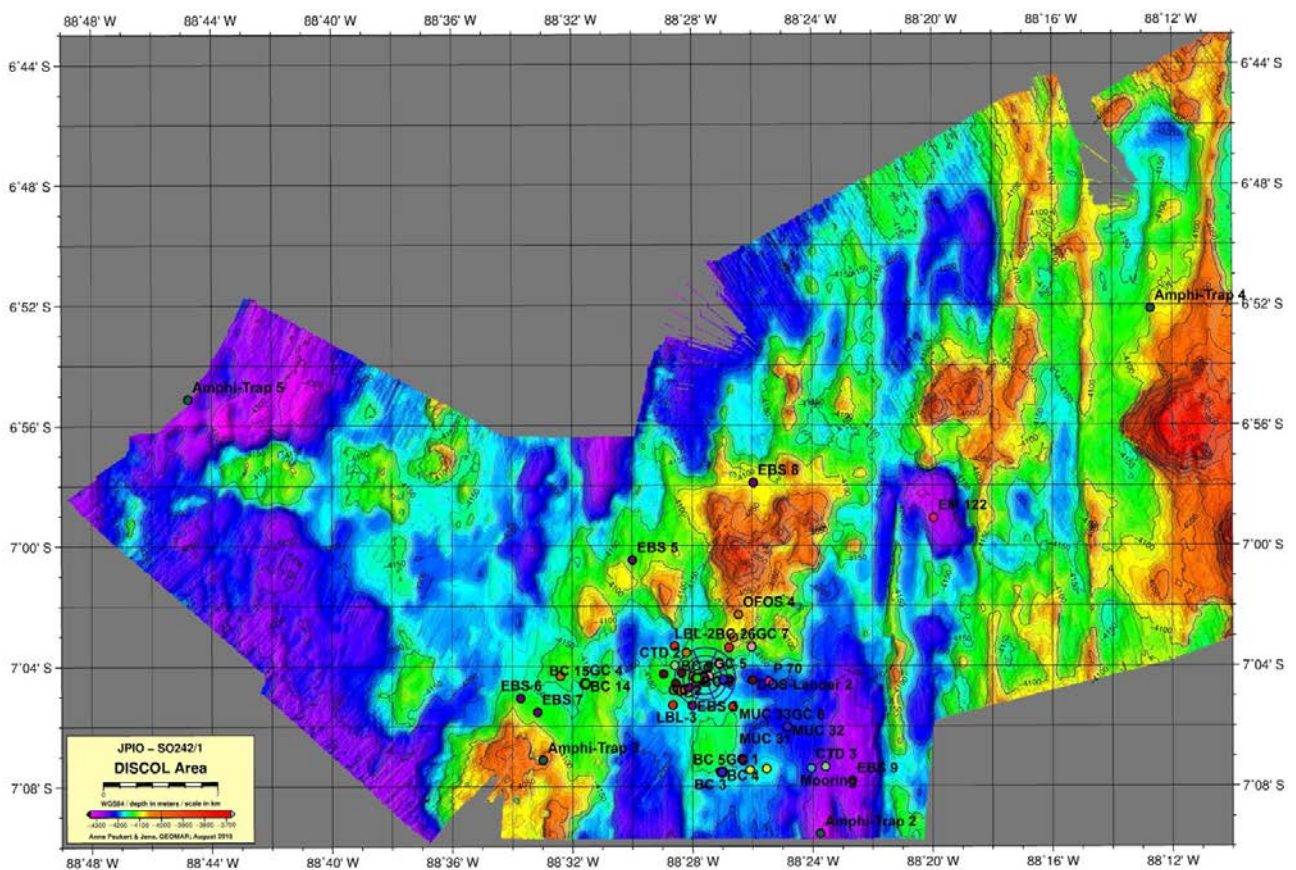


Figure 5: Overview of the sampling sites in the DISCOL area, the circle indicates the DEA area which is shown as AUV sidescan map in Figure 6.

A brief first resume

The AUV once more proved to be a work horse that can be used almost 24/7 and only needs to be on deck for a quick (3h) “pit stop” to change batteries. Without the very precise hydroacoustic maps and images of the AUV we would not have been able to have such a successful cruise and to hand over maps for very accurate ROV navigation for SO242/2. AUVs will without doubt become the most important platform for monitoring deep sea mining activities with respect to investigations of immediate impact on and long-term recovery of the environment.

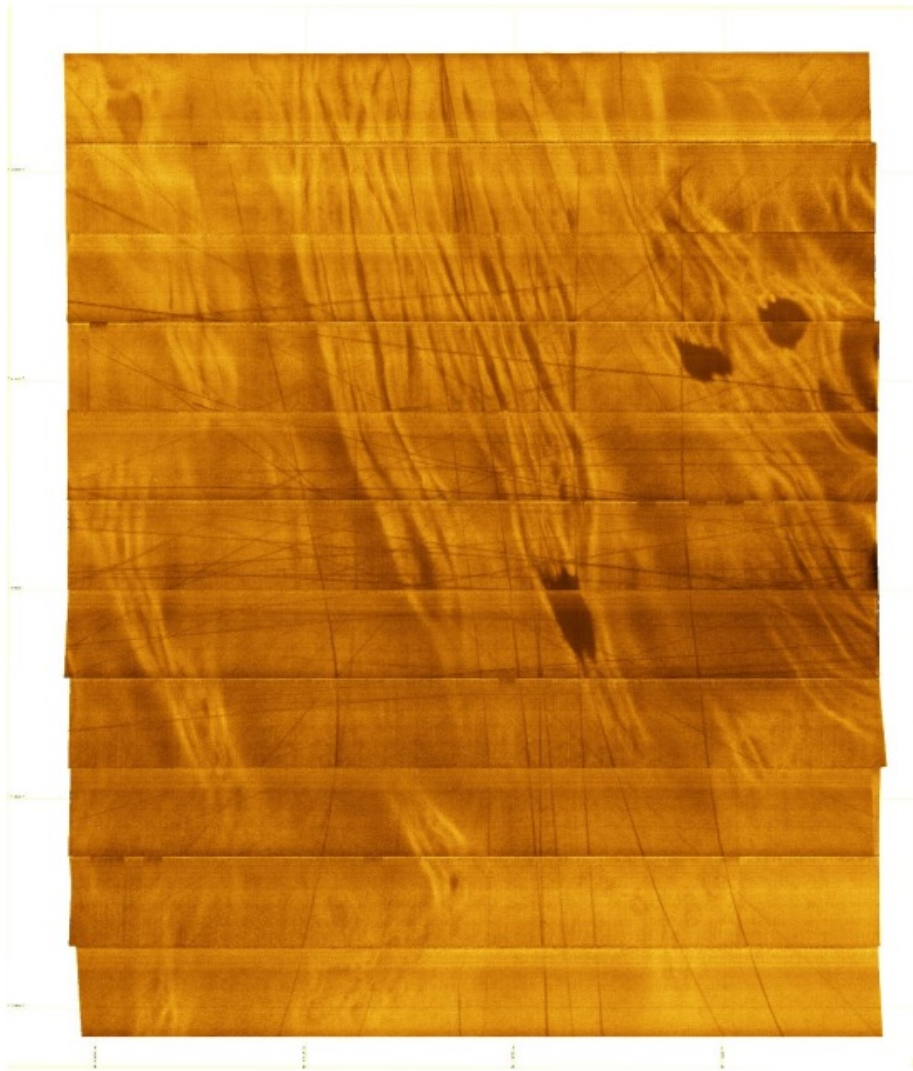


Figure 6: AUV sidescan map of the DEA area. Crisscrossing plough marks are clearly visible as well as three 'Black Patches', which turned out to be nodule-free areas in small depressions.

Plough marks are still clearly visible after 26 years. There is a slight sediment cover, but first analyses of the faunal distribution show that the sessile fauna has not yet recolonized the tracks. Stalked sponges, corals and anemones occur outside the tracks, but still within the DEA. Their distribution patterns inside the DEA does not vary very clearly from those on reference sites. The **Mn-nodule distribution** is not homogenous. There are areas inside the DEA that do not show nodules at the seafloor surface. These areas are e.g. the Black Patches; their shape is determined by the intersection of a hypothetical horizontal plane in a certain distance above the deepest point of the depression. The backscatter response in those depressions is low, indicating a sediment cover with less dense sediment. In addition, gravity corers recovered nodules even in 9m sediment depth. Several more or less intact nodules were found throughout the entire sediment column sampled. **Water current** measurements show slow currents (max. 6cm/s) but a strong tidal signal. Current directions change and no general direction could be observed. As both landers remained at the seafloor for SO242-2, the additional data gained during SO242-2 will provide a better insight into longer-term variations. Our two 'disturbance experiments' demonstrated that **sediment plumes** can be monitored using high frequency ADCPs (1200kHz). The disturbance by the EBS created a sediment plume that stayed close to the seafloor (it could not be detected by the upward looking 300kHz ADCP). First analyses of current trajectories showed that the sediment resettled rather quickly. It became clear that how a plume will behave during large-scale mining cannot be extrapolated from these experiments.

Was it worth it going back to the DISCOL area?

It was certainly worth it going back to the DISCOL area 26 years after the disturbance experiment and 19 years after the last studies in 1996. The huge progress in technological allowed a much more detailed insight into the spatial heterogeneity of the deep sea and the disturbance possible. Within the duration of the JPIO project it will be possible to show how the environment changed during the last 26 years. It is clear already that the environment in the DISCOL area did not revert to the exact same state as before the impact. The studies performed and the technology used will be very helpful to develop best-practice guidelines on how the deep sea could and, to a certain extent, should be monitored prior, during and after deep sea mining activities. All scientists agreed that DISCOL should become a long-term monitoring station that is revisited again.

Acknowledgements

We would like to thank the captain and the crew of RV SONNE for the very pleasant, smooth and very work-intensive first leg of SO242. All scientists enjoyed the cruise very much and some of the “novices” that joined a research cruise for the first time are now spoilt. The ship worked extremely smoothly and efficiently, having had professional help on deck made it possible to work full steam around the clock. We further would like to thank all funding agencies that contributed to JPIO allowing scientists from nine institutions to join this important cruise. These are the German BMBF (grants 03F0707A-G), the Dutch NOW-ALW (grants 856.14.001 and 856.14.003), the Belgian Science Policy Office (grants BR14/MA/JPI-DEEPSEA1 and BR15/MA/JPI-DEEPSEA2), and the Portuguese FCT (grant IF/00029/2014/CP1230/CT0002). Further support was provided by the European Union Seventh Framework Programme (FP7/2007-2013) project Managing Impacts of Deep-sea resource exploitation (MIDAS), grant agreement 603418.

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Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_1-1	CTD 1	2015/07/29	19:58:14	-5:00.584	-84:47.309			Max depth	releaser test at 2000m water depth	Transit	4010.4
242-1_2-1	EM 122	2015/07/29	21:44:17	-5:00.947	-84:47.146			Station start		Transit	4009.7
242-1_2-1	EM 122	2015/07/30	16:33:58	-7:04.083	-88:28.295			Station end	Multibeam profile of transit ended, when the first Station in the DISCOL area was reached	Transit	4132
242-1_3-1	LBL-1	2015/07/30	16:03:00	-7:03.396	-88:26.780			Deployment		DEA	4088.2
242-1_4-1	missing station number								wrong use of the DSHIP software		
242-1_5-1	LBL-2	2015/07/30	16:25:08	-7:03.351	-88:28.593			Deployment		DEA	4149.7
242-1_6-1	DOS-Lander 1	2015/07/30	16:40:09	-7:04.308	-88:28.297			Deployment		DEA	4123.6
242-1_36-1	DOS-Lander 1	2015/08/03	04:13:00	-7:04.589	-88:29.290			Recovery		DEA	4144
242-1_7-1	missing station number								wrong use of the DSHIP software		
242-1_8-1	Amphi-Trap 1	2015/07/30	17:02:36	-7:04.066	-88:27.487	-7:04.066	-88:27.487	Deployment		DEA	4145.7
242-1_8-1	Amphi-Trap 1	2015/08/01	16:29:09	-7:04.174	-88:27.894			Recovery		DEA	4144
242-1_9-1	LBL-3	2015/07/30	17:36:44	-7:05.305	-88:28.655			Deployment		DEA	4163.9
242-1_10-1	LBL-4	2015/07/30	18:05:19	-7:05.356	-88:26.654			Deployment		DEA	4151.1
242-1_11-1	BoBo-Lander 1	2015/07/30	18:36:01	-7:07.428	-88:26.002	-7:07.465	-88:26.086	Deployment	Depth at landing site 4175m	Ref south	4155.9
242-1_11-1	BoBo-Lander 1	2015/08/05	15:20:29	-7:07.638	-88:26.316			Recovery		Ref south	4171
242-1_12-1	Thermistor mooring	2015/07/30	19:43:06	-7:07.408	-88:24.047			Deployment		W of Ref south	4237
242-1_13-1	LBL Calibration	2015/07/30	20:13:53	-7:05.879	-88:26.617			Survey		DEA	4134
242-1_14-1	missing station number								wrong use of the DSHIP software		
242-1_15-1	AUV 1	2015/07/31	03:13:31	-7:04.353	-88:27.624			Deployment	Abyss#0187; SSS and camera test; aborted	DEA	4134.4
242-1_15-1	AUV 1	2015/07/31	03:51:48	-7:04.154	-88:28.537			Recovery		DEA	4133
242-1_16-1	CTD 2	2015/07/31	05:49:23	-7:03.980	-88:28.591			Max depth		DISCOL	4137.3
242-1_17-1	EM 122	2015/07/31	08:29:44	-6:59.086	-88:19.952			Station start		DISCOL	4275.6
242-1_17-1	EM 122	2015/07/31	16:31:23	-7:07.132	-88:20.117			Station end		DISCOL	4116
242-1_18-1	AUV 2	2015/07/31	18:00:00	-7:04.393	-88:27.604			Deployment	Abyss#0188; SSS and camera test	DEA	4154.8
242-1_18-1	AUV 2	2015/07/31	21:33:00					Start mission	see Cruise Report	DEA	
242-1_18-1	AUV 2	2015/08/01	07:53:00					End mission	see Cruise Report	DEA	
242-1_23-1	AUV 2	2015/08/01	10:17:26	-7:04.192	-88:28.695			Recovery		DEA	4139.4
242-1_19-1	MUC 1	2015/07/31	23:42:37	-7:07.518	-88:27.018	-7:07.5058	-88:27.0584	on ground	empty	Ref south	4161.4
242-1_20-1	BC 1	2015/08/01	03:14:59	-7:07.531	-88:27.033	-7:07.5448	-88:27.0487	on ground		Ref south	4161.8
242-1_21-1	Lander	2015/08/01	04:54:41	-7:07.531	-88:27.040	-7:04.237	-88:28.362	Station start		Ref south	4155.5
242-1_22-1	Triangulation MUC 2	2015/08/01	08:18:13	-7:07.542	-88:27.021			on ground	empty	Ref south	4139.4

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
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242-1_25-1	AUV 3	2015/08/01	16:51:16	-7:04.383	-88:27.673			Deployment	Abyss#0189; SSS and camera test	DEA	4153.5
242-1_25-1	AUV 3	2015/08/01	19:31:00					Start mission	see Cruise Report	DEA	
242-1_25-1	AUV 3	2015/08/02	04:48:00					End mission	see Cruise Report	DEA	
242-1_25-1	AUV 3	2015/08/02	09:49:20	-7:04.665	-88:29.650			Recovery		DEA	4154
242-1_26-1	BC 2	2015/08/01	20:04:23	-7:07.536	-88:27.002			on ground	no Posidonia signal	Ref south	4163.6
242-1_27-1	BC 3	2015/08/02	00:46:54	-7:07.548	-88:27.029			on ground	no Posidonia signal	Ref south	4139.4
242-1_28-1	MUC 4	2015/08/02	04:29:25	-7:07.532	-88:27.051			on ground	empty	Ref south	4159.5
242-1_29-1	MUC 5	2015/08/02	06:21:55	-7:07.514	-88:27.003			in the water		Ref south	4159.7
242-1_29-1	MUC 5	2015/08/02	06:49:30	-7:07.510	-88:27.001			On deck	empty	Ref south	4160
242-1_29-1	MUC 5	2015/08/02	07:02:02	-7:07.510	-88:27.000			in the water		Ref south	4162.2
242-1_29-1	MUC 5	2015/08/02	07:51:41	-7:07.512	-88:27.006			On deck	empty	Ref south	4163.7
242-1_30-1	Amphi-Trap 2	2015/08/02	11:02:20	-7:09.387	-88:23.610	-7:09.588	-88:23.749	Deployment		S of DISCOL	4307.4
242-1_30-1	Amphi-Trap 2	2015/08/04	17:13:38	-7:09.722	-88:24.061			Recovery		S of DISCOL	4269
242-1_31-1	BC 4	2015/08/02	13:35:05	-7:07.556	-88:27.001	-7:07.5765	-88:27.0148	on ground		Ref south	4167
242-1_32-1	BC 5	2015/08/02	16:57:26	-7:07.528	-88:27.024	-7:07.5396	-88:27.0389	on ground		Ref south	4162.1
242-1_33-1	AUV 4	2015/08/02	19:12:32	-7:04.375	-88:27.668			Deployment	Abyss#0190; SSS and camera	DEA	4152.6
242-1_33-1	AUV 4	2015/08/02	21:30:00					Start mission	see Cruise Report	DEA	
242-1_33-1	AUV 4	2015/08/03	07:38:00					End mission	see Cruise Report	DEA	
242-1_33-1	AUV 4	2015/08/03	13:05:06	-7:04.422	-88:30.524			Recovery		DEA	4120.8
242-1_34-1	MUC 6	2015/08/02	21:27:28	-7:07.517	-88:27.029	-7:07.524	-88:27.031	on ground		Ref south	4161.7
242-1_35-1	MUC 7	2015/08/03	01:53:21	-7:07.541	-88:27.026	-7:07.558	-88:27.047	on ground		Ref south	4159.9
242-1_37-1	EBS 1	2015/08/03	05:21:27	-7:07.097	-88:26.341			Station start		Ref south	4198
242-1_37-1	EBS 1	2015/08/03	08:02:17	-7:07.276	-88:26.140	-7:07.686	-88:25.706	on ground	EBS on ground	Ref south	4167.3
242-1_37-1	EBS 1	2015/08/03	09:24:41	-7:07.754	-88:25.588	-7:07.854	-88:25.484	off ground	EBS off ground	Ref south	4176.3
242-1_37-1	EBS 1	2015/08/03	10:51:37	-7:07.751	-88:25.588			On deck		Ref south	4176.6
242-1_38-1	GC 1	2015/08/03	15:24:44	-7:07.521	-88:27.024	-7:07.537	-88:27.047	on ground		Ref south	4160.9
242-1_39-1	MUC 8	2015/08/03	18:41:03	-7:07.516	-88:27.029	-7:07.523	-88:27.039	on ground		Ref south	4162.2
242-1_40-1	MUC 9	2015/08/03	22:18:22	-7:07.542	-88:27.022	-7:07.538	-88:27.034	on ground		Ref south	4163.9
242-1_41-1	AUV 5	2015/08/04	00:35:26	-7:04.457	-88:27.591			Deployment	Abyss#0191; SSS and camera	Ref west	4151.1
242-1_41-1	AUV 5	2015/08/04	02:41:00					Start mission	see Cruise Report	Ref west	
242-1_41-1	AUV 5	2015/08/04	12:17:00					End mission	see Cruise Report	Ref west	
242-1_41-1	AUV 5	2015/08/04	15:22:06	-7:08.035	-88:28.273			Recovery		Ref west	4194.5
242-1_42-1	DOS-Lander 2	2015/08/04	01:21:31	-7:04.476	-88:26.000			Deployment		Ref south	4199.2
242-1_42-1	DOS-Lander 2	2015/08/11	14:50:08	-7:04.983	-88:27.140			Recovery		Ref south	4149.9
242-1_43-1	OFOS 1	2015/08/04	01:44:38	-7:04.389	-88:27.951			Station start		DEA	4148.4
242-1_43-1	OFOS 1	2015/08/04	03:50:37	-7:04.345	-88:27.927	-7:04.342	-88:27.975	on ground		DEA	4142
242-1_43-1	OFOS 1	2015/08/04	12:35:43	-7:04.445	-88:27.004	-7:04.394	-88:26.870	off ground		DEA	4146
242-1_43-1	OFOS 1	2015/08/04	14:29:06	-7:04.432	-88:27.188			On deck		Dea	4148.5
242-1_44-1	MUC 10	2015/08/04	19:21:44	-7:07.507	-88:26.998			on ground		Ref south	4159.8
242-1_45-1	EBS 2	2015/08/04	21:36:22	-7:07.116	-88:26.356			Station start		Ref south	4184
242-1_45-1	EBS 2	2015/08/04	23:40:21	-7:07.333	-88:26.121	-7:07.150	-88:26.322	on ground	EBS on ground	Ref south	4195
242-1_45-1	EBS 2	2015/08/05	00:59:30	-7:07.935	-88:25.554	-7:07.532	-88:25.984	off ground	EBS off Grund	Ref south	4169.7
242-1_45-1	EBS 2	2015/08/05	03:00:06	-7:07.456	-88:26.139			Station end		Ref south	4163.3

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_46-1	MUC 11	2015/08/05	05:30:12	-7:07.530	-88:27.010	-7:07.534	-88:27.025	on ground		Ref south	4162.1
242-1_47-1	AUV 6	2015/08/05	07:48:44	-7:04.358	-88:27.658			Deployment	Abyss#0192; MB	DEA	4163.6
242-1_47-1	AUV 6	2015/08/05	11:42:00					Start mission	see Cruise Report		
242-1_47-1	AUV 6	2015/08/05	22:58:00					End mission	see Cruise Report		
242-1_47-1	AUV 6	2015/08/06	03:13:32	-7:05.868	-88:30.307			Recovery		DEA	4147.3
242-1_48-1	BC 6	2015/08/05	09:35:30	-7:04.414	-88:27.834	-7:04.413	-88:27.839	on ground		DEA (heavily disturbed)	4144.4
242-1_49-1	BC 7	2015/08/05	12:42:19	-7:04.412	-88:27.839	-7:04.420	-88:27.852	on ground		DEA (heavily disturbed)	4142.4
242-1_50-1	CTD 3	2015/08/05	17:49:13	-7:07.357	-88:23.572			Max depth	Data lost	Ref south	4256.4
242-1_51-1	GC 2	2015/08/05	21:50:38	-7:04.409	-88:27.826	-7:04.411	-88:27.836	on ground		DEA (heavily disturbed)	4147.7
242-1_52-1	BC 8	2015/08/06	01:05:02	-7:04.404	-88:27.835	-7:04.411	-88:27.844	on ground		DEA (heavily disturbed)	4145.6
242-1_53-1	BC 9	2015/08/06	05:11:19	-7:04.414	-88:27.864	-7:04.423	-88:27.879	on ground		DEA (heavily disturbed)	4146.3
242-1_54-1	BC 10	2015/08/06	08:33:55	-7:04.395	-88:27.846	-7:04.419	-88:27.844	on ground		DEA (heavily disturbed)	4149.8
242-1_55-1	Amphi-Trap 3	2015/08/06	11:33:10	-7:07.129	-88:32.962	-7:07.131	-88:32.977	Deployment		South of western ref area	4043.3
242-1_55-1	Amphi-Trap 3	2015/08/07	15:32:19	-7:07.475	-88:33.323			Recovery		South of western ref area	4089.5
242-1_56-1	MUC 12	2015/08/06	15:32:28	-7:04.346	-88:27.644	-7:04.414	-88:27.760	on ground		DEA (heavily disturbed)	4149
242-1_57-1	BoBo-Lander 2	2015/08/06	17:56:24	-7:04.697	-88:28.497	-7:04.750	-88:28.527	Deployment	Depth at landing site 4131m	DEA	4141
242-1_57-1	BoBo-Lander 2	2015/08/16	06:44:46	-7:04.311	-88:28.769			Recovery		DEA	4144.9
242-1_58-1	CTD 4	2015/08/06	20:08:45	-7:04.705	-88:28.498			Max depth		DEA	4140.8
242-1_59-1	wrong station number								wrong use of the DSHIP software		
242-1_60-1	AUV 7	2015/08/06	22:45:42	-7:04.471	-88:27.652			Deployment	Abyss#0193; MB	DEA	
242-1_60-1	AUV 7	2015/08/07	00:48:00					Start mission	see Cruise Report		
242-1_60-1	AUV 7	2015/08/07	10:26:00					End mission	see Cruise Report		
242-1_60-1	AUV 7	2015/08/07	13:32:40	-7:05.556	-88:29.767			Recovery		DEA	4168.4
242-1_61-1	MUC 13	2015/08/07	01:03:01	-7:04.275	-88:27.790	-7:04.378	-88:27.781	on ground		DEA (heavily disturbed)	4148
242-1_62-1	MUC 14	2015/08/07	04:41:44	-7:04.424	-88:27.862	-7:04.473	-88:27.877	on ground		DEA (heavily disturbed)	4154.4
242-1_63-1	missing station number								wrong use of the DSHIP software		
242-1_64-1	MUC 15	2015/08/07	07:58:01	-7:04.421	-88:27.851	-7:04.466	-88:27.865	on ground		DEA (heavily disturbed)	4153.5

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_65-1	MUC 16	2015/08/07	11:17:58	-7:04.419	-88:27.855	-7:04.422	-88:27.850	on ground		DEA (heavily disturbed)	4151.6
242-1_66-1	EM 122	2015/08/07	17:26:05	-7:00.815	-88:12.852			Profile start		Transit	4070.9
242-1_66-1	EM 122	2015/08/08	11:00:31	-5:08.450	-84:45.972			Information	break in data recording	Transit	3996.9
242-1_66-1	EM 122	2015/08/08	15:48:52	-4:55.115	-84:21.625			Profile end		Transit	3962.2
242-1_67-1	EM 122	2015/08/10	12:55:25	-4:56.048	-84:45.572			Profile start		Transit	3987.6
242-1_67-1	EM 122	2015/08/10	13:38:47	-4:58.983	-84:54.043			Information	Parasound recording started	Transit	3999.6
242-1_67-1	EM 122	2015/08/11	07:32:05	-6:52.079	-88:12.768			Profile end		Transit	4086.1
242-1_67-1	EM 122	2015/08/11	08:16:00	-6:48.194	-88:15.026			Profile start		Transit	4116.1
242-1_67-1	EM 122	2015/08/11	09:20:12	-6:56.036	-88:25.832			Profile end		Transit	4162.3
242-1_68-1	Amphi-Trap 4	2015/08/11	07:39:46	-6:52.128	-88:12.723			Deployment	no Posidonia signal	NE of DISCOL	4077.6
242-1_68-1	Amphi-Trap 4	2015/08/14	04:00:22	-6:52.296	-88:13.199			Recovery		NE of DISCOL	4117.9
242-1_69-1	AUV 8	2015/08/11	10:30:49	-7:04.450	-88:27.735			Deployment	Abyss#0194; MB	DEA	4198
242-1_69-1	AUV 8	2015/08/11	12:41:00					Start mission	see Cruise Report	see Cruise Report	
242-1_69-1	AUV 8	2015/08/11	21:43:00					End mission	see Cruise Report	see Cruise Report	
242-1_69-1	AUV 8	2015/08/12	01:41:41	-7:04.480	-88:28.236			Recovery		DEA	4140.5
242-1_70-1	MUC 17	2015/08/11	12:43:52	-7:04.373	-88:27.779	-7:04.400	-88:27.778	on ground		DEA (heavily disturbed)	4127.5
242-1_71-1	MUC 18	2015/08/11	17:51:36	-7:04.485	-88:27.849				empty	DEA (heavily disturbed)	4127.6
242-1_72-1	DOS-Lander 3	2015/08/11	18:29:59	-7:04.586	-88:28.545	-7:04.583	-88:28.554	Deployment	Triangulation; water depth at landing site is 4116 m	DEA	4129.9
242-1_72-1	DOS-Lander 3	2015/08/16	09:51:35	-7:04.562	-88:28.815			Recovery		DEA	4143
242-1_73-1	MUC 19	2015/08/11	21:53:01	-7:04.358	-88:27.889	-7:04.407	-88:27.895	on ground		DEA (heavily disturbed)	4121.1
242-1_74-1	MUC 20	2015/08/12	04:39:16	-7:03.901	-88:27.085	-7:03.945	-88:27.097	on ground		Black Patch	4150
242-1_75-1	AUV 9	2015/08/12	07:26:21	-7:04.401	-88:27.620			Deployment	Abyss#0195; MB	DEA	4154.2
242-1_75-1	AUV 9	2015/08/12	10:03:00					Start mission	see Cruise Report	see Cruise Report	
242-1_75-1	AUV 9	2015/08/12	21:23:00					End mission	see Cruise Report	see Cruise Report	
242-1_75-1	AUV 9	2015/08/13	00:27:35	-7:04.143	-88:28.791			Recovery		DEA	4138.1
242-1_76-1	OFOS 2	2015/08/12	09:08:11	-7:04.303	-88:32.420			Station start		Ref west	4129.1
242-1_76-1	OFOS 2	2015/08/12	10:33:11	-7:04.309	-88:32.427	-7:04.336	-88:32.398	on ground		Ref west	4131.3
242-1_76-1	OFOS 2	2015/08/12	14:32:33	-7:04.310	-88:30.760	-7:04.072	-88:30.976	off ground		Ref west	4141
242-1_76-1	OFOS 2	2015/08/12	15:56:56	-7:04.346	-88:31.041			On deck		Ref west	4116.6
242-1_77-1	BC 11	2015/08/12	18:25:10	-7:04.574	-88:31.567	-7:04.574	-88:31.577	on ground		Ref west	4130.5
242-1_78-1	BC 12	2015/08/12	21:55:54	-7:04.551	-88:31.559	-7:04.554	-88:31.564	on ground		Ref west	4131.2
242-1_79-1	MUC 21	2015/08/13	03:00:17	-7:04.597	-88:31.608	-7:04.596	-88:31.619	on ground		Ref west	4133.7
242-1_80-1	MUC 22	2015/08/13	06:57:23	-7:04.538	-88:31.576	-7:04.542	-88:31.581	on ground		Ref west	4129.5
242-1_81-1	EBS 3	2015/08/13	09:10:10	-7:03.442	-88:28.903			Station start		DEA	4152.9
242-1_81-1	EBS 3	2015/08/13	11:13:38	-7:05.322	-88:28.005			on ground	EBS on ground / no Posidonia signal	DEA	4162

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_81-1	EBS 3	2015/08/13	12:55:49	-7:05.756	-88:27.367	-7:05.357	-88:27.804	off ground	EBS off ground	DEA	4166
242-1_81-1	EBS 3	2015/08/13	14:31:45	-7:05.378	-88:27.976			On deck		DEA	4163.3
242-1_82-1	CTD 5	2015/08/13	18:12:21	-7:04.890	-88:28.143			Max depth		DEA	4146
242-1_83-1	AUV 10	2015/08/13	20:12:21	-7:04.391	-88:27.662			Deployment	Abyss#0196 camera	DEA	4151.2
242-1_83-1	AUV 10	2015/08/13	22:30:00					Start mission	see Cruise Report	see Cruise Report	
242-1_83-1	AUV 10	2015/08/14	08:15:00					End mission	see Cruise Report	see Cruise Report	
242-1_83-1	AUV 10	2015/08/14	13:12:18	-7:04.967	-88:30.857			Recovery		DEA	4105.4
242-1_84-1	GC 3	2015/08/13	22:37:03	-7:03.929	-88:27.090	-7:03.951	-88:27.093	on ground		Black Patch	4146
242-1_85-1	EBS 4	2015/08/14	06:54:56	-7:03.720	-88:29.356			Station start		DEA	4138
242-1_85-1	EBS 4	2015/08/14	08:43:11	-7:04.738	-88:28.138			on ground	EBS on ground / no Posidonia signal	DEA	4139.7
242-1_85-1	EBS 4	2015/08/14	10:22:11	-7:05.290	-88:27.475			off ground	EBS off ground	DEA	4158.9
242-1_85-1	EBS 4	2015/08/14	11:55:11	-7:05.303	-88:27.471			On deck		DEA	4151.5
242-1_86-1	BC 13	2015/08/14	15:09:25	-7:04.622	-88:31.538	-7:04.627	-88:31.559	on ground		Ref west	4129.5
242-1_87-1	BC 14	2015/08/14	18:22:42	-7:04.612	-88:31.559	-7:04.604	-88:31.563	on ground		Ref west	4123.4
242-1_88-1	AUV 11	2015/08/14	21:14:56	-7:04.375	-88:27.712			Deployment	Abyss#0197 camera	DEA	4161.5
242-1_88-1	AUV 11	2015/08/14	23:18:00					Start mission	see Cruise Report	see Cruise Report	
242-1_88-1	AUV 11	2015/08/14	08:53:00					End mission	see Cruise Report	see Cruise Report	
242-1_88-1	AUV 11	2015/08/15	12:37:58	-7:05.194	-88:27.934			Recovery		DEA	4162.1
242-1_89-1	GC 4	2015/08/14	23:33:15	-7:04.564	-88:31.564	-7:04.562	-88:31.577	on ground		Ref west	4125.4
242-1_90-1	MUC 23	2015/08/15	03:40:10	-7:04.579	-88:31.546	-7:04.558	-88:31.566	on ground	edited from live observations	Ref west	4125
242-1_91-1	MUC 24	2015/08/15	06:55:58	-7:04.585	-88:31.561	-7:04.583	-88:31.558	on ground		Ref west	4127.2
242-1_92-1	MUC 25	2015/08/15	10:08:56	-7:04.560	-88:31.562	-7:04.563	-88:31.567	on ground		Ref west	4127.3
242-1_93-1	EBS 5	2015/08/15	13:43:03	-6:59.902	-88:30.764			Station start		NW of DEA	4142.1
242-1_93-1	EBS 5	2015/08/15	15:35:36	-7:00.954	-88:29.479	-7:00.477	-88:29.989	on ground	EBS on ground	NW of DEA	4064.5
242-1_93-1	EBS 5	2015/08/15	17:41:13	-7:01.541	-88:28.797	-7:01.129	-88:29.232	off ground	EBS off ground	NW of DEA	4050.8
242-1_93-1	EBS 5	2015/08/15	19:07:39	-7:01.536	-88:28.788			On deck		NW of DEA	4054
242-1_94-1	AUV 12	2015/08/15	20:55:17	-7:04.398	-88:27.604			Deployment	Abyss#0198; SSS and camera	DEA	4156.6
242-1_94-1	AUV 12	2015/08/15	23:00:00					Start mission	see Cruise Report	see Cruise Report	
242-1_94-1	AUV 12	2015/08/16	10:25:00					End mission	see Cruise Report	see Cruise Report	
242-1_94-1	AUV 12	2015/08/16	14:30:26	-7:04.693	-88:29.425			Recovery		DEA	4150.3
242-1_95-1	BC 15	2015/08/15	23:27:49	-7:04.587	-88:31.555			on ground	no Posidonia signal	Ref west	4129.5
242-1_96-1	BC 16	2015/08/16	03:56:40	-7:04.480	-88:26.932	-7:04.482	-88:26.943	on ground		DEA (disturbed east)	4148
242-1_97-1	BoBo-Lander 3	2015/08/16	07:43:00	-7:07.422	-88:25.538			Deployment		Ref south	4162
242-1_98-1	BC 17	2015/08/16	12:00:05	-7:04.476	-88:26.921	-7:04.483	-88:26.919	on ground		DEA (disturbed east)	4173.9
242-1_99-1	DOS-Lander 4	2015/08/16	15:00:14	-7:04.268	-88:28.961			Deployment		DEA	4131.2

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_100-1	GC 5	2015/08/16	16:48:21	-7:04.341	-88:27.436	-7:04.342	-88:27.442	on ground		trough	4150.9
242-1_101-1	BC 18	2015/08/16	20:41:03	-7:04.485	-88:26.914	-7:04.477	-88:26.912	on ground		DEA (disturbed east)	4168.8
242-1_102-1	AUV 13	2015/08/16	23:07:33	-7:04.394	-88:27.603			Deployment	Abyss#0199 camera	DEA	4156.1
242-1_102-1	AUV 13	2015/08/17	01:25:00					Start mission	see Cruise Report	see Cruise Report	
242-1_102-1	AUV 13	2015/08/17	10:42:00					End mission	see Cruise Report	see Cruise Report	
242-1_102-1	AUV 13	2015/08/17	14:52:45	-7:06.474	-88:29.015			Recovery		DEA	4183.4
242-1_103-1	BC 19	2015/08/17	00:52:32	-7:04.478	-88:26.914	-7:04.483	-88:26.926	on ground		DEA (disturbed east)	4175.2
242-1_104-1	EBS 6	2015/08/17	03:32:41	-7:04.494	-88:34.423			Station start	EBS flipped over (failed)	Ref west	4155.5
242-1_104-1	EBS 6	2015/08/17	05:24:07	-7:05.515	-88:33.203	-7:05.065	-88:33.726	on ground	EBS on ground	Ref west	4123.8
242-1_104-1	EBS 6	2015/08/17	08:22:21	-7:06.512	-88:32.670	-7:05.888	-88:32.822	off ground	EBS off ground	Ref west	4084.1
242-1_104-1	EBS 6	2015/08/17	09:55:00	-7:06.513	-88:32.647			On deck		Ref west	4088.8
242-1_105-1	BC 20	2015/08/17	12:29:49	-7:04.482	-88:26.922	-7:04.484	-88:26.926	on ground		DEA (disturbed east)	4164.3
242-1_106-1	Amphi-Trap 5	2015/08/17	18:19:50	-6:55.112	-88:44.776			Deployment	no Posidonia signal	West of DISCOL	4268.7
242-1_106-1	Amphi-Trap 5	2015/08/19	20:19:55	-6:54.725	-88:44.859			Recovery			4237.1
242-1_107-1	AUV 14	2015/08/17	21:33:22	-7:04.605	-88:27.888			Deployment	Abyss#0200 camera	DEA (northwest)	4149.7
242-1_107-1	AUV 14	2015/08/17	23:52:00					Start mission	see Cruise Report	see Cruise Report	
242-1_107-1	AUV 14	2015/08/18	06:38:00					End mission	see Cruise Report	see Cruise Report	
242-1_107-1	AUV 14	2015/08/18	10:00:33	-7:02.602	-88:30.392			Recovery		DEA (northwest)	4123.4
242-1_108-1	MUC 26	2015/08/18	00:08:10	-7:04.539	-88:26.842	-7:04.483	-88:26.919	on ground		DEA (disturbed east)	4169.1
242-1_109-1	MUC 27	2015/08/18	04:04:03	-7:04.411	-88:26.833	-7:04.492	-88:26.836	on ground		DEA (disturbed east)	4161.5
242-1_110-1	MUC 28	2015/08/18	07:33:14	-7:04.479	-88:26.751	-7:04.449	-88:26.772	on ground		DEA (disturbed east)	4174.9
242-1_111-1	OFOS 3	2015/08/18	10:42:05	-7:03.550	-88:28.215			Station start		DEA	4137
242-1_111-1	OFOS 3	2015/08/18	12:44:38	-7:03.567	-88:28.192	-7:03.565	-88:28.203	on ground		DEA	4362.6
242-1_111-1	OFOS 3	2015/08/18	17:04:19	-7:04.495	-88:26.881	-7:04.464	-88:27.057	off ground		DEA	4162.8
242-1_111-1	OFOS 3	2015/08/18	18:27:32	-7:04.500	-88:26.896			On deck		DEA	4165.8
242-1_112-1	OFOS 4	2015/08/18	19:03:33	-7:02.313	-88:26.467			Station start		Seamount	4089.8
242-1_112-1	OFOS 4	2015/08/18	20:49:58	-7:02.307	-88:26.462	-7:02.300	-88:26.465	on ground	edited from live observations	Seamount	4058
242-1_112-1	OFOS 4	2015/08/19	00:06:00	-7:03.682	-88:25.961	-7:03.609	-88:25.962	off ground		Seamount	4161
242-1_112-1	OFOS 4	2015/08/19	01:30:09	-7:03.674	-88:25.959			On deck		Seamount	4158.4
242-1_113-1	AUV 15	2015/08/19	02:15:51	-7:04.386	-88:27.620			Deployment	Abyss#0201 camera	Ref south	4152.9
242-1_113-1	AUV 15	2015/08/19	04:41:00					Start mission	see Cruise Report	see Cruise Report	

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_113-1	AUV 15	2015/08/19	14:24:00					End mission	see Cruise Report	see Cruise Report	
242-1_113-1	AUV 15	2015/08/19	16:39:06	-7:07.357	-88:27.328			Recovery		Ref south	4137.1
242-1_114-1	MUC 29	2015/08/19	04:03:28	-7:04.451	-88:26.964	-7:04.449	-88:26.973	on ground		DEA (disturbed east)	4159.6
242-1_115-1	MUC 30	2015/08/19	07:24:05	-7:04.507	-88:27.042	-7:04.451	-88:26.981	on ground		DEA (disturbed east)	4157.3
242-1_116-1	P 70	2015/08/19	09:25:01	-7:04.519	-88:25.449			Profile start		East of DEA	4167
242-1_116-1	P 70	2015/08/19	15:33:30	-7:04.626	-88:27.881			Profile end		East of DEA	4126.8
242-1_117-1	EBS 7	2015/08/19	22:23:30	-7:04.414	-88:34.459			Station start	no Posidonia signal	Ref west	4155.7
242-1_117-1	EBS 7	2015/08/20	00:34:01	-7:05.531	-88:33.159			on ground	EBS on ground	Ref west	4168
242-1_117-1	EBS 7	2015/08/20	03:06:21	-7:06.344	-88:32.161			off ground	EBS off ground	Ref west	4133.3
242-1_117-1	EBS 7	2015/08/20	04:39:51	-7:06.339	-88:32.162			On deck		Ref west	4119.4
242-1_118-1	AUV 16	2015/08/20	05:52:45	-7:04.391	-88:27.603			Deployment	Abyss#0202; SBP test and SSS	Northeast of DEA	4156.2
242-1_118-1	AUV 16	2015/08/20	09:14:00					Start mission	see Cruise Report	see Cruise Report	
242-1_118-1	AUV 16	2015/08/20	22:30:00					End mission	see Cruise Report	see Cruise Report	
242-1_118-1	AUV 16	2015/08/21	01:55:19	-7:03.441	-88:25.450			Recovery		Northeast of DEA	4108.9
242-1_119-1	MUC 31	2015/08/20	08:37:35	-7:06.044	-88:24.830	-7:06.033	-88:24.826	on ground		Ref east	4204.1
242-1_120-1	BC 21	2015/08/20	12:28:25	-7:04.421	-88:27.845	-7:04.407	-88:27.852	on ground		DEA (heavily disturbed)	4144.3
242-1_121-1	BC 22	2015/08/20	15:31:19	-7:04.422	-88:27.850	-7:04.421	-88:27.862	on ground	edited from live observations	DEA (heavily disturbed)	4141
242-1_122-1	EBS 8	2015/08/20	18:18:41	-6:57.950	-88:27.112			Station start		N of DEA	4078
242-1_122-1	EBS 8	2015/08/20	20:12:19	-6:57.997	-88:25.324	-6:57.914	-88:25.955	on ground	EBS on ground	N of DEA	4081.6
242-1_122-1	EBS 8	2015/08/20	22:56:14	-6:58.021	-88:23.862	-6:57.963	-88:24.458	off ground	EBS off ground	N of DEA	4050.7
242-1_122-1	EBS 8	2015/08/21	00:41:00	-6:58.021	-88:23.861			On deck		N of DEA	4049.9
242-1_123-1	GC 6	2015/08/21	03:48:48	-7:06.049	-88:24.836	-7:06.045	-88:24.848	on ground	no Posidonia signal for most of the deployment	Ref east	4216.8
242-1_124-1	BC 23	2015/08/21	07:22:13	-7:04.419	-88:27.847	-7:04.411	-88:27.848	on ground		DEA (heavily disturbed)	4144.6
242-1_125-1	AUV 17	2015/08/21	09:08:46	-7:04.398	-88:27.621			Deployment	Abyss#203; SBP and SSS	Northeast of DEA	4157.7
242-1_125-1	AUV 17	2015/08/21	13:14:00					Start mission	see Cruise Report	see Cruise Report	
242-1_125-1	AUV 17	2015/08/21	23:33:00					End mission	see Cruise Report	see Cruise Report	
242-1_125-1	AUV 17	2015/08/22	02:27:01	-7:05.351	-88:23.936			Recovery		Northeast of DEA	4288
242-1_126-1	EBS 9	2015/08/21	11:07:09	-7:08.871	-88:22.592			Station start		Southeast of DISCOL	4119.4

Station Number	Device	Date [yyyy/mm/dd]	Time (UTC) [hh:mm:ss]	Ship Position		Device Position		Action	Comment	Area	Water Depth [m]
				Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]	Latitude [dd:mm.mmm]	Longitude [dd:mm.mmm]				
242-1_126-1	EBS 9	2015/08/21	13:09:00	-7:07.183	-88:22.724	-7:07.823	-88:22.674	on ground	EBS on ground	Southeast of DISCOL	4277.4
242-1_126-1	EBS 9	2015/08/21	15:31:56	-7:06.234	-88:22.787	-7:06.786	-88:22.756	off ground	EBS off ground	Southeast of DISCOL	4280
242-1_126-1	EBS 9	2015/08/21	17:06:44	-7:06.242	-88:22.798			On deck		Southeast of DISCOL	4275.7
242-1_127-1	BC 24	2015/08/21	20:07:01	-7:04.410	-88:27.839	-7:04.411	-88:27.846	on ground		DEA (heavily disturbed)	4146.9
242-1_128-1	BC 25	2015/08/21	23:21:38	-7:04.420	-88:27.845	-7:04.411	-88:27.843	on ground		DEA (heavily disturbed)	4146.4
242-1_129-1	BC 26	2015/08/22	04:21:40	-7:03.364	-88:26.015	-7:03.373	-88:26.026	on ground		Small crater	4144.3
242-1_130-1	MUC 32	2015/08/22	08:05:44	-7:06.043	-88:24.830	-7:06.036	-88:24.837	on ground		Ref east	4204.1
242-1_131-1	MUC 33	2015/08/22	12:15:06	-7:06.042	-88:24.835	-7:06.034	-88:24.835	on ground		Ref east	4203.8
242-1_132-1	GC 7	2015/08/22	14:56:53	-7:03.363	-88:26.020	-7:03.369	-88:26.031	on ground		Small crater	4151.7
242-1_133-1	LBL Recovery	2015/08/22	17:10:02	-7:03.167	-88:27.055			On deck		DEA	4109.9
242-1_133-1	LBL Recovery	2015/08/22	17:54:13	-7:03.131	-88:28.898			On deck		DEA	4185.5
242-1_133-1	LBL Recovery	2015/08/22	18:50:52	-7:05.176	-88:28.791			On deck		DEA	4167
242-1_133-1	LBL Recovery					-7:05.349	-88:26.766	Information	Transponder did not release	DEA	
242-1_134-1	OFOS 5	2015/08/22	20:07:50	-7:04.827	-88:28.396			Station start		DEA to Eastern Basin	4148
242-1_134-1	OFOS 5	2015/08/22	21:40:17	-7:04.835	-88:28.389	-7:04.828	-88:28.393	on ground		DEA to Eastern Basin	4147
242-1_134-1	OFOS 5	2015/08/23	04:06:00	-7:04.402	-88:25.411	-7:04.546	-88:25.634	off ground		DEA to Eastern Basin	4190.3
242-1_134-1	OFOS 5	2015/08/23	05:32:29	-7:04.404	-88:25.420			On deck		DEA to Eastern Basin	4190.7
242-1_135-1	OFOS 6	2015/08/23	06:23:47	-7:03.052	-88:26.656			Station start		Seamount	4067.1
242-1_135-1	OFOS 6	2015/08/23	07:51:42	-7:03.041	-88:26.591	-7:03.057	-88:26.634	on ground		Seamount	4081.3
242-1_135-1	OFOS 6	2015/08/23	11:01:56	-7:02.925	-88:25.427	-7:02.907	-88:25.447	off ground		Seamount	4122
242-1_135-1	OFOS 6	2015/08/23	12:21:34	-7:02.923	-88:25.428			On deck		Seamount	4121
242-1_136-1	P 70 / EM 122	2015/08/23	13:21:21	-7:09.800	-88:20.563			station start		Transit	4153.7
242-1_136-1	P 70 / EM 122	2015/08/24	08:45:10	-5:15.743	-84:44.912			station end	end at 200nmi zone	Transit	3946.6