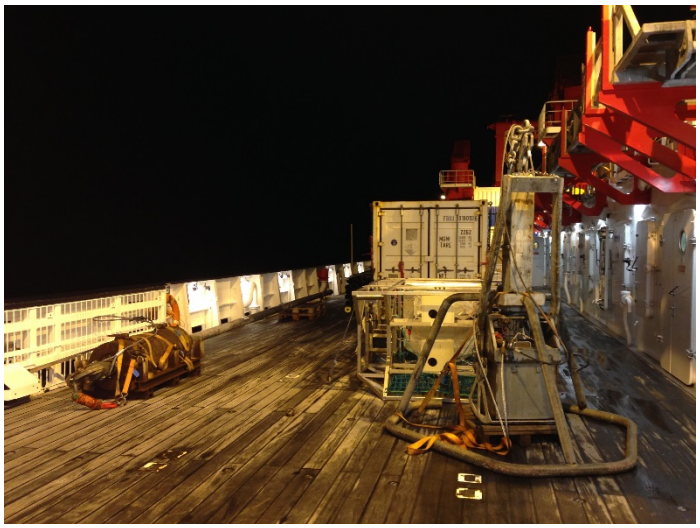
Weekly Report SO242-1 DISCOL REVISITED

5th July – 11th August 2015

„Some time to map, rest and write“

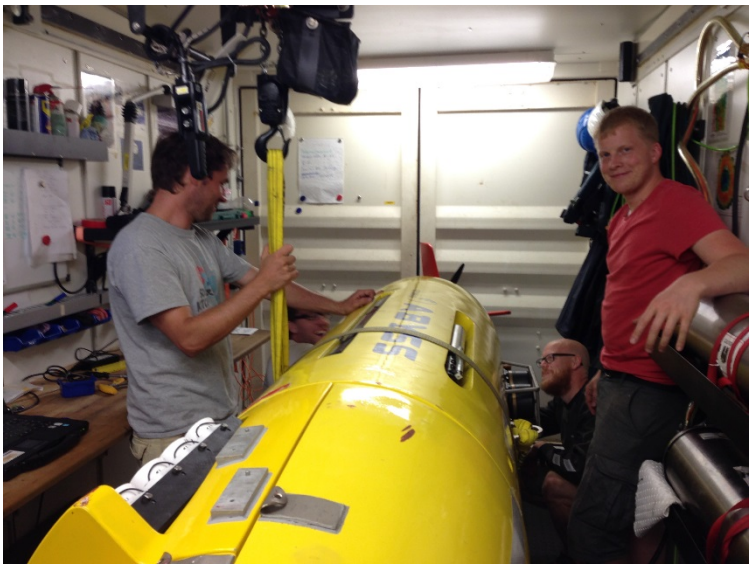
After finishing our sediment sampling in the southern reference area, a second EBS deployment on 5th August was almost the last station to get the complete set of samples we aimed for. The EBS was towed even closer to the BoBo lander than the previous tow and we were rather happy to have the USBL system to get a good landing position of the EBS sled on the ground. So far, the epibenthos sled has only recovered small numbers of animals and the 'EBS gang' is hoping to get a bigger catch next time.
The following MUC was the second last on the reference site and we started sampling a heavily disturbed area inside the DEA, just 500m WSW of the DEA centre (an area that had been sampled earlier). After deploying the AUV, two box corers made the beginning of getting sediments from plough tracks, which we were able to hit very precisely thanks to the accurately georeferenced AUV side scan map. After a short intermezzo back to the thermistor mooring for doing a calibration CTD cast, we continued sampling the strongly disturbed area during the night from 5th to 6th August with box corers and one gravity corer. As part of the Amphipod Trap studies, the trap was deployed 10km SW of the DEA centre, followed by another MUC in the DEA and the second deployment of the BoBo lander in preparation for our second disturbance experiment with the EBS. During the 2nd experiment we also aimed to sample the water influenced by the sediment plume. To get the normal background conditions of the lower most water column we deployed the CTD right after the BoBo and collected water samples that were filtered for particle load and fixed for onshore metal concentration analyses.



Parts of our gear: gravity corer (left), box corer (foreground right) and epi-benthos sled (behind the box corer). All the other equipment is busy recording on the seafloor or being lowered into the water to take samples.

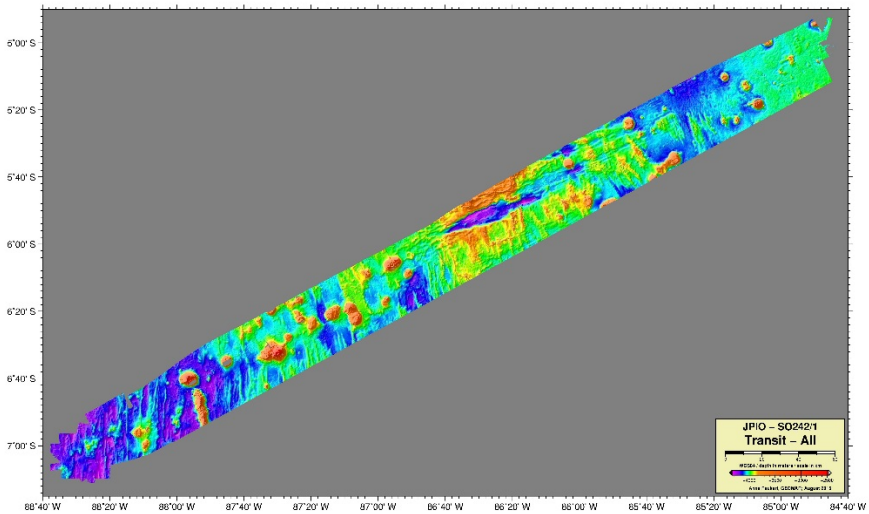
With our box core stations finished in the strongly disturbed area, it was the MUC people's turn to get their samples. Four TV-guided MUCs recovered sediment that showed a greater oxygen

penetration depth in contrast to undisturbed areas. This is because reactive organic material and small animals, which normally consume the oxygen close to the seafloor surface, were removed by the disturbance. As a result, the oxygen in the upper 10cm of the sediment was not or to a lesser degree consumed and could diffuse into greater depths. This was predicted by geochemical modelling, but the geochemists were happy to see their understanding of the deep sea geochemical processes confirmed.



The AUV can run in three configurations; here it is changed from the multibeam configuration to the "taking photos" configuration.

In the morning of 8th August during the daily meeting at the bridge, the captain informed me that we had an ill person on board who needed treatment on shore and that we would need to go back to Guayaquil. After retrieving the Amphipod Trap that was placed 10km SW of the DEA, we headed off towards Guayaquil in ENE direction. Having an entire hydroacoustic mapping group on board, we took the opportunity to map the deep sea along the way by planning two multibeam survey lines north and south of the former transit line towards the DISCOL area. The patient was safely brought to Guayaquil for further treatment, we hope the recovery is quick! In total the transit to Guayaquil and back took us 7th August 10:30 to 11th August, 2:30 a.m.



Bathymetric map of the three transits between Guayaquil and the DAE area. Data recording started outside the 200nmi zone, outside Ecuador's EEZ.

Many of my colleagues used the time get some sleep, which was in short supply the week before. Before we left for Guayaquil, we had completed a total of 65 stations. This would have not been possible without the very efficient work routines all teams automatically established, particularly deploying equipment. No time is lost between stations or with gear changes, the AUV 'Tiffy' is always at the sea surface to be picked up when planned, waiting, blinking and beeping. The BoBo and DOS landers as well as the Amphi Trap are already released while the station before is still ongoing to minimize waiting for their arrival back at the sea surface. Once the "cruise machinery" was running, it was running fast and this from the very first day. Part of this machinery is preparing a cruise report, which in very large parts should be finished while we are still on board. So we took the opportunity and started describing our gear, methods and first results during transit hours to and from Guayaquil.

A giant Mn-nodule was recovered from the western reference area; Henko De Stigter from NIOZ (Netherlands) is very happy about it.

Right now we are sampling our third area 3.5nmi west of the DEA centre. This area is another 'undisturbed' reference site that was investigated in the past. In the morning of 11th August we deployed the Amphi Trap 40km NE of DEA and continued with multi corer stations inside DEA. In addition to our planned sampling we took one multicorer in a 'black patch' that we mapped with side scan sonar. This area is not covered by Mn-nodules and we still have to figure out why this is the case, maybe the geochemical studies will tell us more.

Wind and waves have picked up, but luckily the strongest wind moved through the area while we transited to Guayaquil, now we have to deal with a swell of 3-4m height that is slowly ceasing; our work is not affected by the swell and the weather forecast does not look too bad. More news will follow, I remain with best greetings, also from the entire scientific party,

Jens Greinert, chief scientist SO242-1