

21.07.-27.07.08



Photo 1: Sampling gas bubbles from a mussel bed ( DIAPIR site; All Photo sources: MARUM)

We have reached the first target area of a giant gas flare at one of the diapir structures off Angola on the 23 July. After a first reconnaissance of the gas flare by Parasound-enabled acoustic mapping, we started the QUEST4000 dive 207 at around noon. By using a combination of acoustic wayfinding with the forward looking sonar of the ROV and regular checks of characteristic features on the seafloor, we were able to track at least one of the sources of free gas emission at this diapir site. Following the sonar image of gas bubbles, we landed on a giant mussel bed teeming with life. The mussels (mytilids) are symbiotic organisms hosting thiotrophic and methanotrophic bacteria

in their gills. They attract many other organisms, which form a fascinatingly rich ecosystem at a depth of 2800 m (Photo 1). As one goal of the first dive, we were testing a variety of the tools and cameras of QUEST and were really happy about the new installation of a vertical camera which allows precise visual mapping of the seafloor – but the most astonishing asset of QUEST remains the HDTV camera which allows to see the single filaments of the mussel gills bathing in the methane-rich fluids, and all the microlife associated to the mussel bed such as dense swarms of tiny copepods. But unfortunately before the end of the dive, a major oil leak was discovered that forced us to interrupt the task list and to recover QUEST.

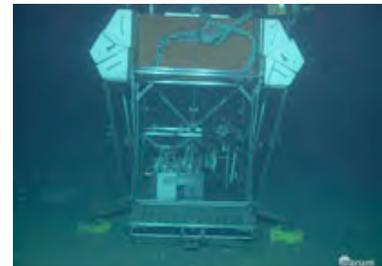


Photo 2: The lift deployed at REGAB carrying benthic chambers and blade cores

After considerable repairs, we attempted further dives at our main working area REGAB, but unfortunately, the problem with oil leakage could not be stopped. Hence, we decided to reorganize the planned dives and to limit ourselves to dives with 3-5 hours bottom time and a lift deployment (Photo 2) every 2 days as long as the oil leakage remains. This will still allow the use of our in situ payloads, and the planned work at main target REGAB, but we will have to sacrifice the program of exploring other areas of the Gabon and Angolan margin. Volker Ratmeyer and his ROV crew are working in shifts around the clock to do their best in providing dives, and continuing with the search for errors and subsequent repairs. Also the METEOR crew supports us very well in these days of very irregular deployment and recovery times and of a high uncertainty with the planning of station work, so we still hope to fulfill a substantial part of the goals of this expedition. The three short dives at REGAB between the 24 and the 27 July have provided us with net and pushcore samples from bacterial mats (Photo 3) and



Photo 3: Bacterial mats growing on reduced, highly gassy seafloor

clam fields (Photo 4), as well as with a first in situ microsensor and respiration chamber measurement and we were also able to deploy some colonization experiments (Photo 5). When we cannot dive, we continue with Parasound mapping of the West African deep margin, and we have had a series of interesting sediment samples from 3-6 m gravity cores filled with hydrates or carbonates, and sometimes tubeworms and mussels.



Photo 4: Pushcore sampling in front of the benthic chamber on a

solve the problems with the oil leakage. Further details of our daily work and the scientists on board can be found on the expedition BLOG hosted by [www.planeterde.de](http://www.planeterde.de).



Photo 5: Placing colonization experiments next to tubeworm bushes (TRACS)

With regards - Antje Boetius and the Scientific Crew of GUINECO leg 2