

04.08.-10.08.08



The fourth week of the GUINECO leg 2 was dedicated to exploration and measurements on the eastern part of the REGAB pockmark. In 2000, dives of IFREMER's BIOZAIRE expedition found that the eastern part of the pockmark was characterized by a flat and sedimentary seafloor, covered by large mussel beds (Fig. 1) associated with gassy sediments. The first overview of this area 8 years later indicated considerable changes over time. The extension of the mussel beds is strongly reduced and they seem to be replaced by assemblages of vesicomid clams, potentially indicating a decrease in the gas flux.



Fig 1: Mussel beds on gassy sediments. The assemblages are similar to those on carbonate and include tubeworms, shrimps, snails and copepods

Our plan for the fourth week of this leg was to obtain estimates of community respiration, to sample the different megafauna habitats in the eastern part of REGAB and to analyze sulfide and methane fluxes. However, unfortunately, the ROV team had to cope with more technical problems including oil leakage, arm replacement and the failure of the wonderful HDTV camera system. We used the repair time to explore the mud volcano area with more detailed bathymetric mapping as

well as video-guided transects and targeted sampling with the TV-multiple corer.

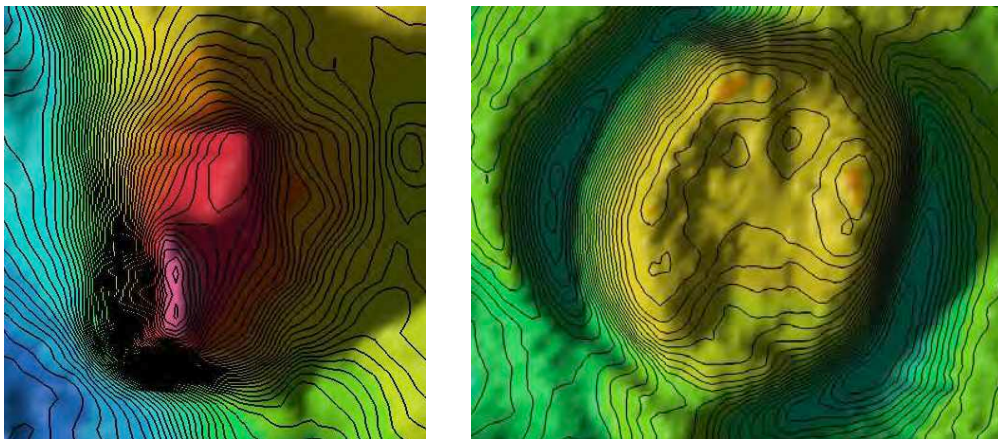


Fig 2: Two mud volcanoes of the Northern Diapir region. Maps by Cesar Caparachin

We investigated the two most prominent mud volcanoes, a cone- and a pie shaped structure (Fig. 2). The cone shaped mud volcano has two peaks in between which we observed extensive carbonate platforms populated by communities of filtering organisms, including what looked like deep-sea corals, and a variety of echinoderms. The pie shaped structure was uniformly covered by pelagic sediments, and did not show any type of structuring, or conspicuous fauna assemblages. For a more precise mapping of potential gas emission sites we lacked the detailed flare mapping by the Parasound system. The parasound was dysfunctional for a week before its

miraculous repair by the ship's electronics and system operators, just in time for the "Bergfest" (half time party). Hence, the gas flare mapping on the mud volcanoes is a further task for the remaining time of the cruise.



Fig 3. The Eddy correlation system by Frank Wenzhöfer (MPI) to measure integrated oxygen fluxes is placed on the mussel bed.



Fig 4. Carbonate colonization experiments by Florian Brinkmann (MARUM)

Also in time for the Half Time party were two excellent dives at the end of the fourth week. After thorough maintenance, QUEST dives 222 and 223 on Thursday and Friday showed the full excellence of the ROV system – both dives provided over 10 hours of bottom time, and allowed us to finalize the main objectives the fourth week. We carried out a series of benthic flux measurements (Figure 3) on the remaining mussel beds as well as the vesicomid assemblages in the eastern area of the pockmarks, and we were able to deploy a series of carbonate colonization experiments as well as to collect more megafauna for the investigation of the diversity of chemosynthetic symbioses at REGAB. Also, we found areas of gas bubble escape where they were not expected – away from the center and not associated with carbonate formation or benthic assemblages.

Finally, the week ended with very nice Saturday night Barbicue Party. While completing another transect for Parasound and bathymetry mapping of the West African margin, all scientists and crew got together to officially celebrate the cruise half time (the correct date was 5 August).



It was good to have this moment of recreation before another challenge awaited the ROV team – again the ROV cable came up terribly twisted and bent and needed to be replaced to allow the continuation of dives in the Southwest of the REGAB pockmark.

Further details of our daily work and the scientists on board can be found on the expedition BLOG hosted by www.planeterde.de.

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