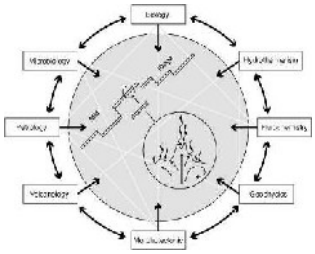
MSM 10/3

Jan. 11th – Feb. 13th, 2009

2nd weekly report



The second week of our Hydromar VII cruise began with quite an adventure. On the evening of January 18th we received a distress call from a couple on a 36 ft sailboat with a broken mast about 100 nautical miles (nm) away from us. The sea had been quite rough for the entire week, with winds up to 7 – 8 Bft and waves up to 4 m high. The sailboat was downwind of us, and we spent the entire night with the sailboat moving steadily ahead of us at 6 kn, as the captain of the sailboat did not want to turn the boat into the wind towards our direction for fear of the mast breaking completely, with the possibility of it then causing the boat to capsize. Although we immediately headed in their direction after getting the call, it took us almost 15 hours before we were able to sight the boat around 10 on the morning of January 19th. We had hoped to bring the sailboat along side the Merian, but the high waves made this impossible (Figure 1). As the couple had decided to abandon their boat, Captain von Staa gave the order to use the Merian's Fast Rescue Boat to bring the couple from their boat to our ship. The exhausted but otherwise healthy couple arrived safely on the Merian together with their wet luggage, and after recuperating for a few days are now learning a lot about hydrothermal vents!

Fig. 1: Sailboat rescue. The sea looks a lot calmer on this photo than it actually was!

Fig. 2: Our water chemists Marco Warmuth and Annette Heddaeus with CTD samples

We were able to resume our scientific program on January 20th. As the seas were still too rough for deploying the ROV Kiel 6000, we kept ourselves busy running CTDs, CTD Tow-yos, and MAPR Tow-yos. Our goal is to better understand how the plumes that rise from the Logatchev vents are dispersed in the water column, and how currents and tides influence this dispersal. On January 22nd we were excited to find a vent plume at 3200 m. All known vent structures at the Logatchev 1 hydrothermal vent field (LH1) where we are currently working are above 3000 m. As vent plumes on the Mid-Atlantic Ridge always rise about 200 – 400 m above their source, we now know that there must be active vents as deep as 3400 – 3600 m! We are now deploying even more CTDs and CTD Tow-yos in our hunt for these new vent sites and our poor water chemists are getting almost no sleep at all (Figure 2).

On January 25th, we were delighted to wake up to a somewhat quieter sea and were able to dive with the ROV Kiel 6000 for the first time. Although the dive was cut short after only 3 hours because of oil leakage, we were able to sample fluids for chemical and biological analyses and collect mussels for molecular and physiological measurements.

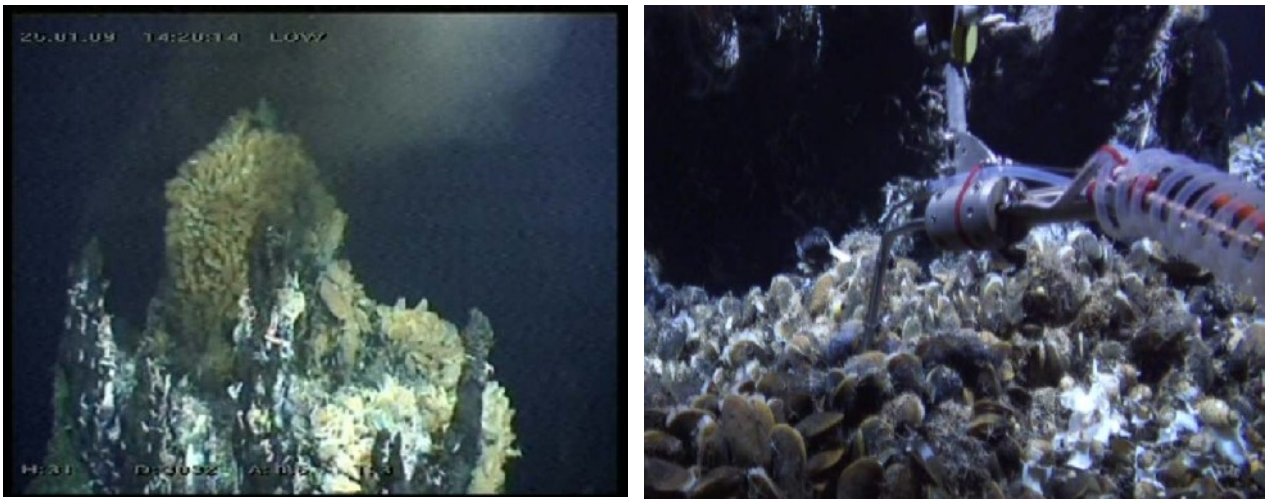


Fig. 3: Images from our ROV dive of the Logatchev hydrothermal vent field at 3030 m depth. On the left, the active smoker Irina II, and on the right, the sampling of diffuse vent fluids from a mussel bed for GB analyses (see below). Copyright: IFM-Geomar

Particularly exciting for us was the successful deployment of an in situ mass spectrometer (GB for Gas Buster). The GB was developed by Peter Girguis and Scott Wankel (Harvard University) and can measure all dissolved gases (e.g. H_2S, CH_4, H_2, O_2, CO_2, etc.) at depths down to 4000 m. Stéphane Hourdez (CNRS, Roscoff Biological Station) is our GB Master for this cruise. With his online readings of CH_4 and H_2 we can, for the first time, quickly assess while diving, which sites are strongly influenced by vent fluids and choose our samples accordingly.

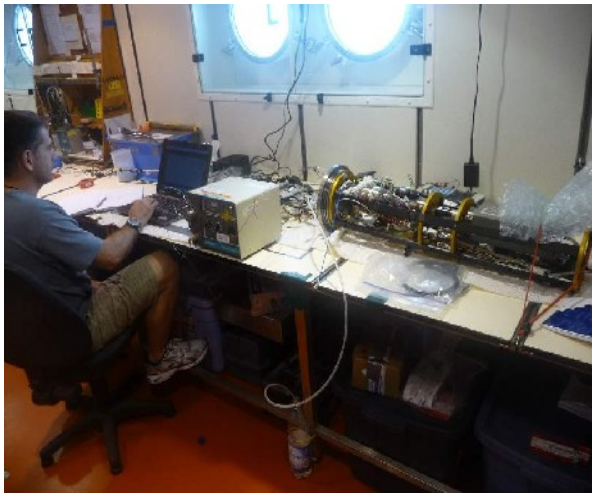


Fig. 4: Stéphane Hourdez reading out data from the in situ mass spectrometer (aka Gas Buster)

We are very much enjoying our cruise on the Merian, the ship is well designed for scientific research, the crew is incredibly helpful and supportive, and the cook is ruining our waistlines with his fantastic food.

Nicole Dubilier and the scientific crew of MSM10/3
January 25th, 2009