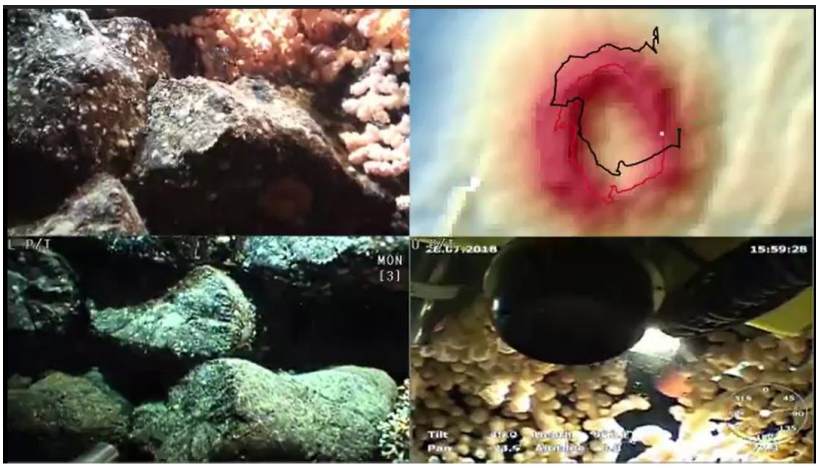
MSM75

Weekly Report #5

23.07.2018 – 29.07.2018

The week began with our arrival in Area 4 which we mapped during a period of poor weather through until Sunday afternoon, launching the AUV on Sunday evening to get a first idea of any hydrothermal signals that might be present. Area 4 is located in a region where geophysicist colleagues imaged a magma chamber in the crust in the late 1990´s and so a major target for our hydrothermal search. Imagine our surprise when the AUV surfaced showing exactly zero targets for hydrothermalism! And this despite the fact that the spreading axis itself appears very volcanically active. Obviously something is very wrong with our understanding of how such ridges work. Additional and more detailed sampling and ROV investigations on Monday and Tuesday confirmed this lack of present activity on the seafloor, in the process however returning excellent animal samples for the biologists. Clearly, if we wanted to find out how the seafloor here is being cooled it was time for a change of approach and we spent many hours as a team going over the results looking for other options than exploring the spreading axis itself for black smoker vents. In the end it was decided that the hydrothermal search had to be extended to regions outside the axial valley and the AUV was dispatched on an exploratory dive. But this part of our planet was not going to give up its secrets that easily – we waited in vain at the appointed position and time for the AUV to return. And we have still heard nothing from her, five days later. The chances of us recovering our “Tiffy” seem now very slim and we probably have to accept that the vehicle is lost. Sad news for all on board.

The lack of an AUV heavily curtailed the amount of exploration which we could carry out in Area 4 and so, on Friday, we completed our sampling of rocks and biota and began the return trip to Reykjavik, during which we will stop at the other three working areas and investigate the targets produced during the exploration in earlier weeks. First stop on this journey was Area 3, where the biologists were keen to investigate large areas of barnacles, possibly a hydrothermal indicator species, which we had seen previously on our visit here and the geologists needed to collect samples from the areas the AUV had mapped. We began this work with a ROV dive in excellent weather on Saturday which returned masses of barnacle samples and also marked the first ROV dive on this cruise to have been streamed live to the internet – colleagues both aboard and on land have been working hard up to now to solve technical issues in sending video data in good quality from ship to shore but now seem to have solved it. At the beginning of our second live dive on Sunday there were 150 users logged in to watch



the seafloor exploration, many of them colleagues or friends interested to learn about our work. Some of them also got actively involved, with several of us receiving online messages from our colleagues with their interpretation of what they were seeing. This kind of involvement can make every cruise and every dive more successful by increasing the number of experts working on it – that has been the driving force behind all the work to make it happen technically.

At the end of the week the ROV is just returning from its last dive and the geological shifts are preparing for a night of sampling. All are immensely enjoying the fascinating research work, the fine collegial atmosphere on board and the perfect ship-side support!

On behalf of the scientific team of MSM75

Colin Devey

Pictures: Barnacles on a pillow lava (GEOMAR ROV-Team); Screenshot of live-stream (courtesy M. Elsig)

Addendum: Just after writing this we got our first, cryptic signals from Tiffy! She is obviously at the surface without GPS information, our satellite phone providers, which she uses to send her messages, are helping us narrow down her position as we steam south to search for her. More on the search next week....