

MSM75

Weekly Report #2

02.07.2018 – 08.07.2018

Our first full week at sea was packed with exciting discoveries! The weather was exceptionally good, allowing us to complete all our planned station work and all the equipment, whether it was high-tech robots or low-tech sediment grab, functioned perfectly.

Using the maps we made on our arrival at the first working area we were able to plan a sampling and investigation strategy and quickly got into a good working rhythm. During the daytime we deployed



the ROV “Phoca” to observe and sample the seafloor. Using a range of different tools on the ROV the biologists began the job of investigating the benthic fauna – picking up pieces of rock with sponges and other sessile organisms attached, scooping sediment with the shovel and using a net to catch large sea-urchins, for example. In the evenings and into the night, a Van Veen grab was deployed from the ship to collect sediment and an epibenthic sled was used to collect the creatures sitting on the seafloor. The myriad creatures collected then need to be sorted and classified, with the

biologists spending many hours staring through the microscope into petri dishes full of animals fixed in alcohol.

Most evenings, when the ROV came out of the water, the AUV “Abyss” was sent on its way to collect high-resolution acoustic reflectivity maps. These maps clearly pick out the distinction between hard, rocky seafloor (which reflects sound well) and soft, sedimented seafloor which only returns a weak echo. “Flying” at only 50m above the seafloor, Abyss collects incredibly detailed images. These enable us to distinguish individual lava flows, faults etc. quite clearly for future sampling with the ROV, one of the major goals of this cruise.

All of this lava is of course cooled by seawater, in the process generating hydrothermal mineral deposits and habitats for very specific ecosystems. During one of the ROV dives we visited one such habitat and found extensive areas covered with bacterial mats on the seafloor. These bacteria live from the gases released by the reaction between hot rock and seawater.



During this cruise we have 4 working areas which we need to investigate. None of the areas have yet been mapped at the resolution we need for the AUV and ROV investigations so on Thursday we proceeded south to Area 2 to begin mapping. We deployed “Abyss” as soon as we got into Area 2 to perform long survey lines investigating the water column for signs of hydrothermal activity. A ROV dive in the area soon confirmed what the mapping had suggested – the seafloor here shows little magmatic activity but is repeatedly cut by faults. As this is meant to be one of the more magmatically active parts of the world, we now have a problem to explain the lack of volcanism!

We end the week mapping in Area 3 – the weather is not conducive to AUV or ROV deployments so we are doing as much preparatory work as we can. The forecast for Tuesday and after is better, though!

All on board are well and enjoying the science as ever.

8 July 2018

Colin Devey