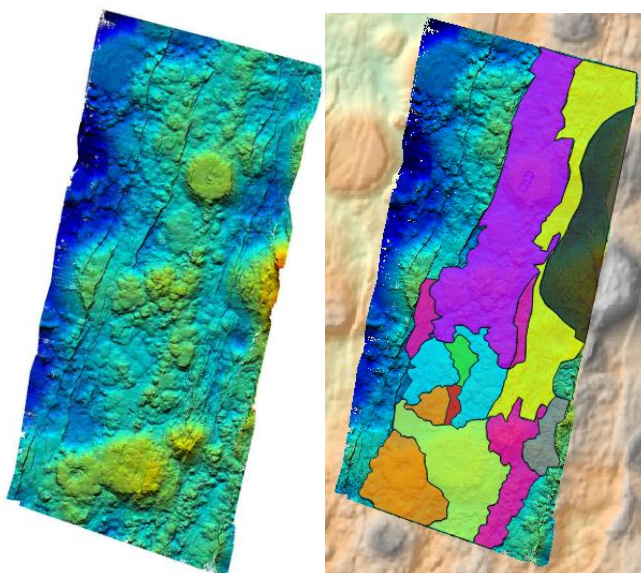


## MSM75

### Weekly Report #3

09.07.2018 – 15.07.2018

We began Week 3 by returning to Area 2 and beginning the seafloor investigations there. An initial AUV dive with its side-scan sonar showed that the sedimentation rates were dramatically lower than in Area 1 further north, making the neovolcanic zone homogeneously sediment-free. This meant that the side-scan map was less useful here than in the North for distinguishing individual lava flows and so we changed tactics, using the high-resolution mapping capabilities of the AUV to show us the shapes of the flows. The resulting maps are spectacular! Using them we were able to plan ROV dives to investigate the geological contacts, in the process producing a quite detailed geological map of the seafloor. With this we are moving one step closer to the goal of many marine geologists – being able to do "fieldwork on the seafloor" and so using the techniques which are so successful on land underwater.



*The AUV bathymetry map (left) and the geological map (right) based on an interpretation of the bathymetry combined with seafloor observations made with the ROV.*

During the ROV dives we also aimed to investigate any hydrothermal occurrences which might be present – these turned out to be rare and unspectacular, however, with no signs of any chemosynthetic ecosystems being found. So, as at Area 1, the amount of hot water venting appears to be also quite low at Area 2 leaving us with even more problems to explain how this thick seafloor is cooled.

Parallel to the geological work, the biologists worked on expanding their seafloor sampling. With the ROV we collected deep-water coral and sponge samples (including all the animals which live on and in them) whilst the epibenthic sled and sediment grab were used in older parts of the crust. The number and variety of creatures we have collected has surprised even the biologists it seems, and all are happy with the specimens.



*A large variety of creatures call this soft coral fan their home, as this close-up photograph taken in 700m water depth shows.*

We also were able to celebrate a milestone event on Friday – the 300<sup>th</sup> dive of the AUV (or "Tiffy" as she is affectionately known to all on board). The team decorated the vehicle nicely for this event and sent her off for another successful dive. Since GEOMAR acquired the AUV in 2008 with the help of funding from the DFG, it has spent 3.500 hours underwater and traversed over 18.000 km of seafloor, making it one of the most successful vehicles of its type anywhere in the world. Its longest ever dive occurred on this cruise, with a record 137km "flown" in one 24-hour dive. A cruise of the type we are performing would be almost impossible to achieve without such a vehicle.



*"Tiffy" loaded into the launching system and ready for her 300<sup>th</sup> dive*

At the end of the week we have moved on to Area 3 and are preparing for the first ROV dive there. The weather forecast is good for the next several days so all being well we will be able to make major advances in our understanding of this area during week 4.

All on board are well and making the best use of the calm weather to investigate the seafloor!

15 July 2018

Colin Devey