

The deployment of dredges and OBS's, processing of samples and initial data interpretation are all now running smoothly and professionally. It is even harder to believe that our third week at sea has gone by already. Even harder to think is that we now have to start preparing in time freight lists and custom forms for shipping the transport containers back to Germany.

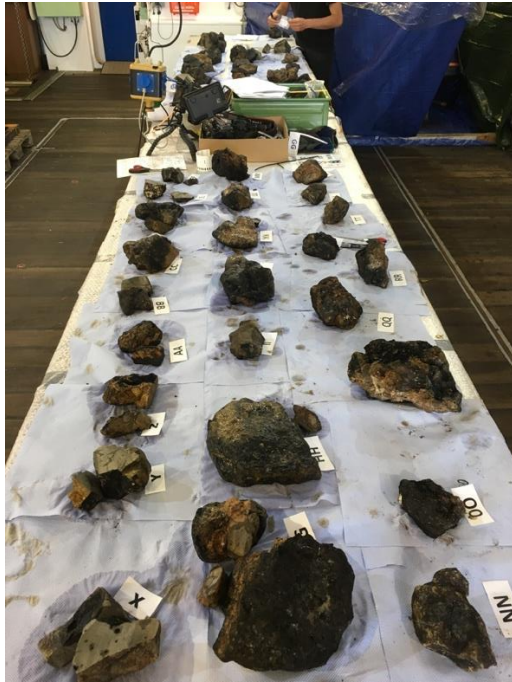


A successful chain dredge haul is on its way onboard (Photo: Jan Falkenberg)

Most of last week was dedicated to seismic investigations. But on Monday we took the opportunity to dredge samples in the more western part of the graben as we crossed it again while recovering the ocean bottom seismometers (OBS).

A dredge is a steel frame with teeth at the upper opening and a chain bag at the end in which rock samples are collected as the dredge is pulled over volcanic structures of

interest. The most effective way for us to recover rock samples is to dredge steep slopes on seamounts or in the graben. The ship can only dredge along tracks that face into the oncoming wind and waves. So sometimes we cannot dredge the optimum slopes, which reduces the chances of obtaining a large number of samples. The ship stops over the deepest part of the selected dredge track and the dredge is lowered down to the sea floor. Then the ship is driven slowly towards the endpoint of the track and only as much cable as needed is payed to keep the dredge stationary on the seafloor so as to avoid getting it tangled. Once the ship is at the end position, the dredge is pulled toward the ship and finally brought onboard.



Left: Samples from a very successful dredge haul waiting for a first general description. Right: Very crude craftsmanship is needed before the samples are analyzed after the cruise using very sophisticated and sensitive analytical equipment. We have improvised a hermetically sealed tent to protect the ship from the shower of dust and mud from our rock saw. However, this is no protection for the valiant saw operator.

(Photos: Stefan Krumm, Jan Falkenberg)

Inside the dredge there are steel cylinders in the four corners for collecting sediment. They are retrieved by the scientists and brought into the lab as soon as the dredge is onboard. Then the dredge is emptied onto the deck using a crane to turn it upside down. After the deck's crew have safely secured the dredge, the scientists are allowed to gather the samples. The first thing to do is to photograph the samples to help establish later if they are stones dropped by icebergs (dropstones). Of course, dropstones provide no information about the sampled volcano or rift valley. Next the samples are sorted into various rock types and sawn into two pieces in order to classify them and gauge their degree of alteration. Similar looking rocks are grouped and the best samples selected for further investigation onshore. Outer crusts are removed with

the rock saw and the least altered parts cut into small pieces to be used in the preparation of thin sections, isotopic age determinations, and major, trace element and isotopic geochemical analyses. Finally, the samples are described, photographed again and packed and labeled. The photographs and information about the samples is being compiled on an ongoing basis for the final cruise report.

The forecast of bad weather and high swell forced an end to dredging in the graben so we started recovering the remaining OBS's. Luckily all the OBS's were recovered, and so far, the data seem to be excellent.



*A rock saw hero.
(Photo: Stefan Krumm)*

We continued to the southwest to start sampling the Jean Charcot Seamount. Chains of seamounts are built as an oceanic plate moves over a „hot-spot“ for many millions of years. After a certain period of time volcanoes drift away from the hotspot as a new volcano is formed over the hot-spot. Hotspots are considered to be connected to the deep mantle so are an important window on how the earth works. For example, reconstruction of the direction and speed of tectonic plates and determination of the composition and dynamics of the Earth's mantle. Attempts to dredge the southern end of the Jean Charcot Chain were unsuccessful due to unfavorable wind and wave direction and because the seamounts at the southern end of the Jean Charcot Chain are very small and offer few steep slopes suitable for dredging.

Fortunately, we were very successful in sampling the first large seamount we encountered, which is located to the south of the RGR. During transit and while approaching potential dredge position the geophysicists map the sea floor, measure sediment thickness, and continue collecting along with gravimetric and magnetic data.

We are expecting a lot more interesting samples from the larger seamounts in the northern half of the Jean Charcot Chain. The weather forecast is promising and all on board are busy yet relaxed.

From sea, 30°24'S / 36°07'W

Stefan Krumm, Wolfram Geissler and the scientific party!