# FS METEOR Expedition M154-2 SEKT

***Sector collapse kinematics and tsunami implications***

2nd Weekly report: 06.05. – 12.05.2019

As begun in the first week, the scientific work on board continued this week by drilling MeBo70. We continued at GeoB23711, which started last Sunday drilling the undisturbed deposits east of Montserrat. This leg was successfully completed on Tuesday at a drilling depth of 65.30 mbsf. With a core recovery of 41.3%, we were able to recover material from all depth sections, which is a very positive core gain for the partly very sandy sediments with embedded, several cm-thick, gravelly volcanic deposits. This material, which is difficult to drill, has always presented the MeBo team with challenges and the drilling was accompanied by constant adjustments of the drilling parameters. In addition to coring, the borehole was logged over the entire depth using the acoustic probe.

With the experience of the first drilling and after intensive maintenance work, MeBo70 continued drilling at this location on Wednesday. This time a drilling depth of 70.3 mbsf was reached. After opening the cores, both parallel cores exhibit complementary structures. These data in combination with the logging data enable us to identify the individual lithologies and gain a deep insight into the background sedimentation. First sediment descriptions and interpretations show that we have drilled deposits from several eruptions and flank collapses. Further investigations will show how these are temporally related to the landslide events of Deposit 2.

At the moment, the MeBo70 is drilling again within the central part of Deposit 2, with the aim to drill through both sections: Deposit 2a and 2b, down to the base of the slide masses. The first deployment at this location had to be stopped this morning due to technical drilling issues. The very fine-grained sands have cemented the drill bit repeatedly. Despite various flushing attempts and repeated rebuilding of the drill string, a core barrel used could not be recovered from the drill string and we had to stop drilling. After only 5 hours maintenance and with a new strategy, MeBo70 is already back in operation.

The maintenance times were used to continue the hydro-acoustic mapping and further gravity coring. One of the objectives was a gravity core transect over the western flank of the trench structure in the area of Deposit 2 (Fig. 2). The major aim of this was to shed light on the activity of various faults identified in bathymetry and seismic data. For this purpose 6 gravity cores with a length of up to 2.81 mbsf were taken, sampling the recent eruption history of the Soufriere Hills volcano (Fig. 1). Even individual phases of the most recent volcanic activity (the 1995-2013 eruption) as well as older events can be observed in the upper centimetres of GeoB23710.


*Fig1. Shows a scan of the gravity core GeoB23710.*

Together with the gravity corer, a temperature probe developed by colleagues from Southern Methodist University Dallas was deployed. Heat flow measurements have been successfully carried out. First results show a clearly increased value of temperature gradient in the area above the fault system (GeoB23715). This value is significantly higher than the recently measured surrounding sites but also higher than the values measured during the IODP campaign in 2013.

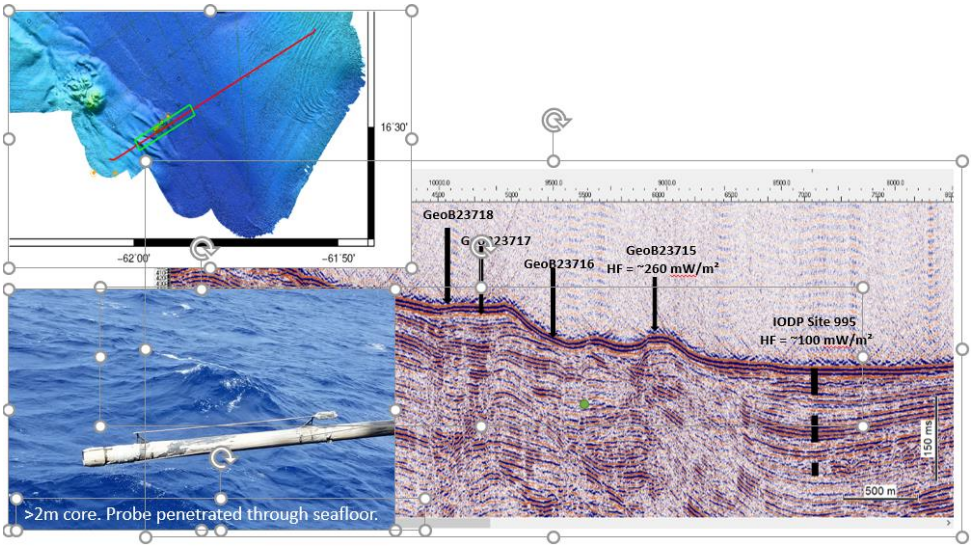


*Fig2. Shows the location of the temperature profile on the western flank of the trench structure above Deposit 2.*

A stiff eastern breeze of 7 Beaufort remains with us also this week. Thanks to the daily detailed weather report by the meteorologist of the DWD on board, we were always well prepared for a light swell. Yesterday evening we used the evening to celebrate the “Bergfest” and the birthday of our colleagues on board. In addition we enjoy the local temperatures - especially with a view to the weather reports from home.

On behalf of all participants of the M154-2 with best regards from on board the FS METEOR

Katrin Huhn