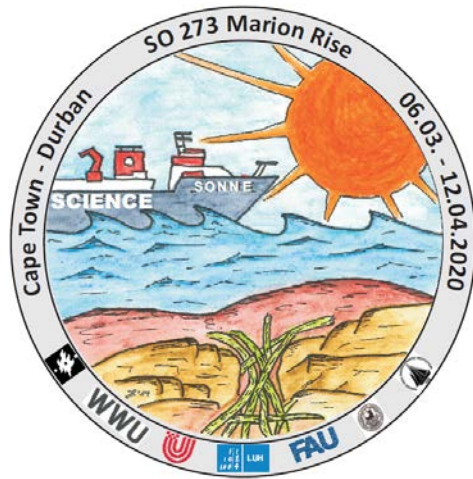


Expedition SO273 – MARION RISE

Cape Town - Durban

Weekly Report No. 4

23. – 29. March 2020



After the decision to abandon Expedition SO273 due to the COVID-19 Pandemic early, no further station was performed, so that both the mapping program and rock sampling with ROV (Remotely Operated Vehicle) and dredges is complete. In the last week, we worked on the remaining samples taken so far: we completed the rock descriptions; all rocks were photographed; in sampling parties, the samples have been assigned to the different (international) working groups; the samples taken have been packed and labelled, including the use of IGSN sample numbers. IGSN stands for "International Geo Sample Number", an alphanumeric code that uniquely identifies geological samples important in documenting and exchanging samples in our international working group. The registering of the samples was done prior to the cruise in the System for Earth Sample Registration (SESAR).

Of special focus were those samples displaying a foliation and which were taken with the ROV as orientated samples. Foliation refers to a planar arrangement of structural or textural features (e.g., shales, schists) as a result of tectonic force. The quantification of this foliation, i.e. the direction of the foliation and the dip angle relatively to the horizontal plane is necessary to reconstruct the formation of a mountain ridge or to reconstruct the tectonic orientation of individual sections. For this, we need the structural data from the outcrop from which the sample was taken, which are provided by the "heading" and "dipping" of the ROV, which is recorded in the corresponding dive video. For orienting the samples, the ROV-videos were analyzed with respect to their structural information, and these were transferred to the rock samples. During the post-cruise research, the microtextures of these rocks will be investigated by polarizing and electron microscope, and the results will be discussed in the frame of the outcrop orientation. This is important for the tectonic reconstruction of the "Brunelli Ridge", a ridge formed due to transpression within the Eric Simpson Fracture Zone.

During the last days of the transit, we cleaned the labs and placed all the equipment we brought with us as well as the rock samples into the container. Bathymetric mapping was continued until entering the EEZ (Exclusive Economic Zone) of South Africa. At the 26.3.2020 we reached the bay of Cape Town and disembarked the South African Observer, which was the end of the expedition.



Mike Cheadle (Wyoming University, left) und Daniele Brunelli (University Modena, right) during the transfer of the structural data from the outcrop to an orientated sample taken by ROV. For this, it is necessary, to analyse the corresponding dive video in terms of the outcrop orientation (i.e., the direction of the foliation and the dip relatively to the horizontal). (Photo: J. Koepke).



Watchstander Team (from left to right: Linnert Neunz, FU Berlin, Marcel Hanisch and Alexandra Zeh, both FAU Erlangen) at work in the hydroacoustic lab. With great care, love and passion, they remove outlier signals from the data sets. The corrected data will be integrated into the bathymetric map. (Photo: J. Koepke).

To sail back to Germany will take us about 3-4 weeks. We all are deeply concerned about the situation at home and send you all best wishes for a good health.

From the South Atlantic during transit to Germany, 29. March 2020, 23° S / 9° E

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<https://www.geo.uni-hannover.de/de/expedition-marion/>