

2. Weekly Report SO271/2 (INDEX2019)

29.12.2019

The first week in the work area was spent completely in License Cluster #5. Upon arrival on Monday and after retrieving the towed magnetometer system used on the transit, the EM sensor system Golden Eye was deployed at the KAIREI sulfide area. In generally good weather conditions, which, however, included wind forces around 6 Bft. and wave heights of 3 meters, a very detailed mapping of the KAIREI field began along profiles each about 800 m long with a profile spacing of 50 m each. Since the Golden Eye is lowered to the seafloor every 50 m (ground conditions permitting) for a stationary measurement, an almost regular grid of electrical conductivity measurements with high spatial resolution is created.

The requirements for the navigation of the ship are very high for this profile trip with a cable-bound measuring device in 2500 m water depth, especially in the prevailing wind and sea conditions. In this regard, the SONNE offers unique possibilities for dynamic ship positioning and stroke compensation of the deep-sea cable, which are currently not available in any other research vessel. The measurements, which were interrupted on Tuesday (Christmas Eve) in order to measure the northern part of Cluster # 5 at a profile distance of 2.5 km with towed magnetics, were correspondingly problem-free.

After deployment of six ocean bottom seismometers, which will record the natural seismicity in the immediate vicinity of the KAIREI field until October 2020, Golden Eye profiling resumed on Wednesday afternoon. These were completed on Thursday evening after a total of 183 landings on the seabed. If time permits, further measurements should follow with the electrical dipole-dipole-system (IP system) also installed on the Golden Eye. Initially, however, another ten ocean bottom seismometers from Geomar were deployed throughout Cluster # 5, which will also record seismicity until October 2020.

With the wind picking up on Friday, the deep-towed bathymetry sled Homeside was used to close gaps in the mapping in the wider area of KAIREI, especially with the magnetometer also mounted on Homeside. After the wind had calmed down to the usual 5-6 Bft., we made the short transit to the KAIMANA sulfide field on Friday evening, where the Golden Eye was brought back to the water. In a mapping pattern similar to that at the Kairei field, we have since (with a short break for service work) completely mapped the northeastern part of the KAIMANA field with the coil system and landed the device on the seabed 177 times. The measurements with the IP system are currently running on the same profiles.

There are three cameras installed on the Golden Eye, one of them a downward looking very high resolution camera for still images and videos of the biology and geology of the ocean floor. By now, almost 100 hours of seabed observation have accumulated which are used by the biologists on board for a thorough documentation of the seabed fauna. Due to the systematic profiling, approx. 10% of the total area of the examined sulfide fields and their surroundings are covered directly by the camera

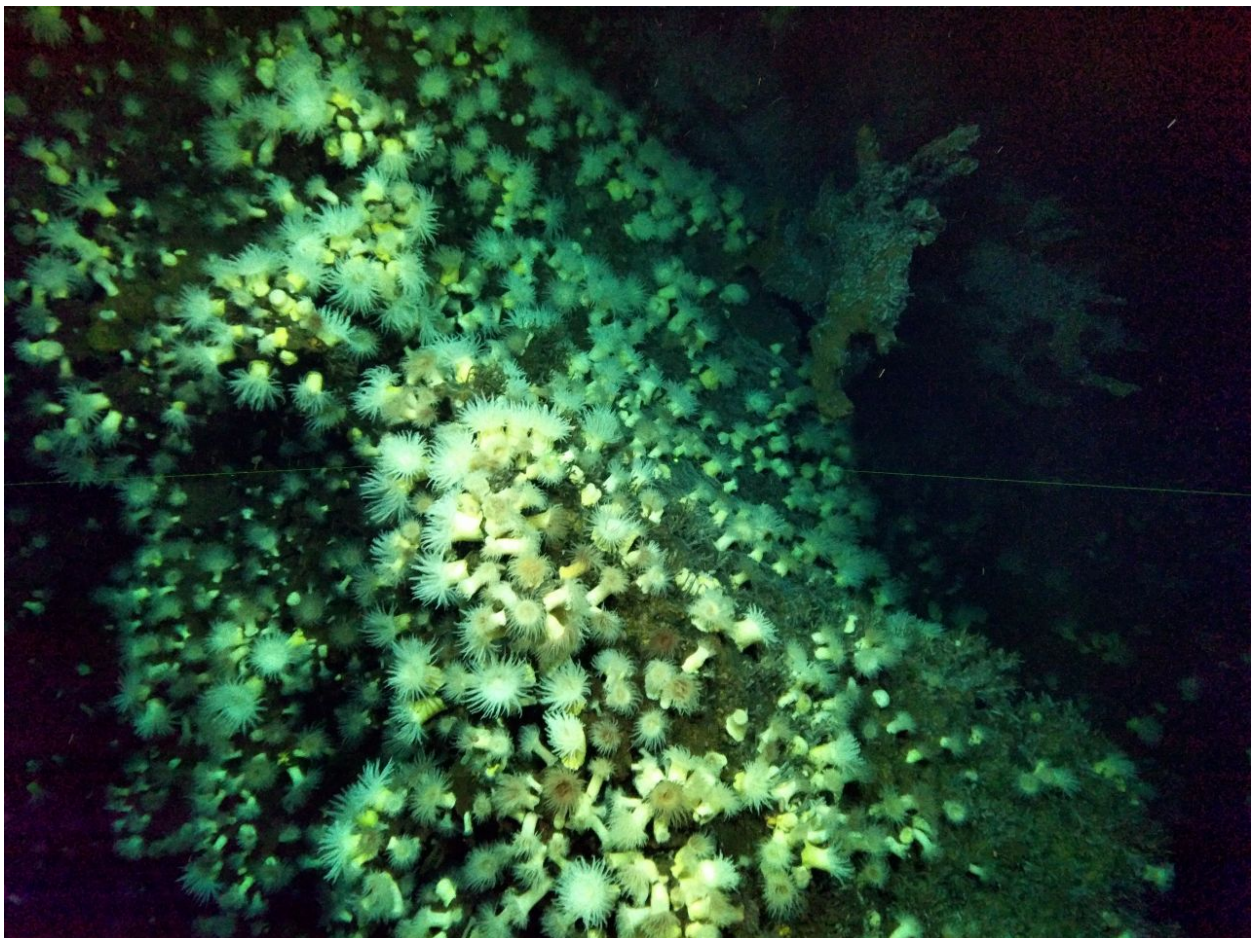
observations and thus a representative overview of the biology of these areas is possible.

Despite the ongoing work, we had an atmospheric Christmas party on board, for which the ship's cook brought a party meal that was highly praised on all sides. Everyone on board is well and is eagerly following the camera images from the sea floor, which are transmitted to the monitors installed on all decks.

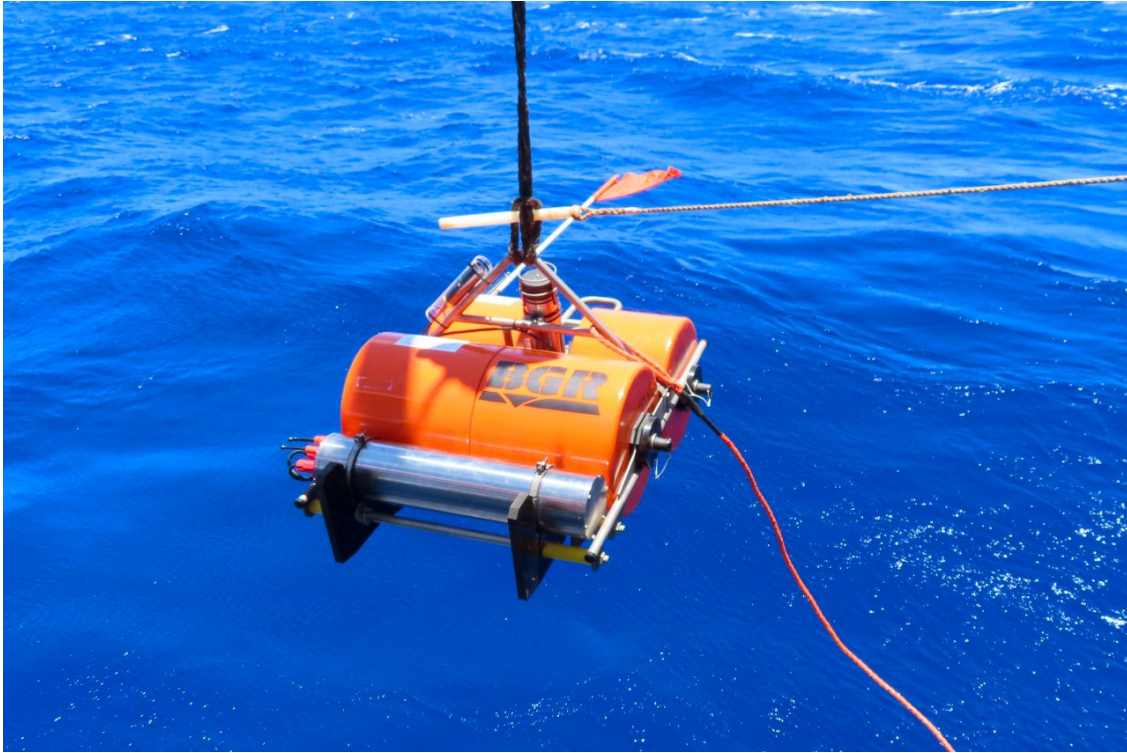
With best regards,

PD Dr. Udo Barckhausen, chief scientist

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Anemones at the KAIREI field, Photo: BGR



Deployment of an ocean bottom seismometer, Photo: Boris Hahn