

3. Weekly Report SO271 (INDEX 2019)

11.-17. Nov. 2019



18.11.2019

The third week of cruise SO271 (INDEX2019) was characterized by detailed geological and sulfide area mapping in the license clusters #04 and #05 by ROV ROPOS. A total of six ROPOS dives addressed the sulfide areas EDMOND-GAUSSSCORE and KAIMANA. The dives were used to better constrain the regional distributions and to characterize the sulfide ore and biodiversity in greater detail by observations and sampling. It turned out that the inactive GAUSS and SCORE sites have a significant larger size that, however, is still obscured by overlying sediments. Overall, the sulfide-mineralized area with evidences on the ocean floor has a length of about 1.8 km and a width of about 300m. EDMOND is located further to the South and associated with a different, subparallel structural fault system.

KAIMANA is entirely associated with intrusive mafic and ultramafic rocks and occurs within a regional block of exhumed deeper oceanic crust. The sulfide mineralization is hosted by two sets of crosscutting faults with WNW-ESE and NE-SW orientation perpendicular to the Central Indian Ridge running overall NW-SE. There is evidence for sulfide mineralization over an area of 700 by 250m, with areas being overlain by gabbroic talus beyond these limits. KAIMANA is in the waning state of hydrothermal activity and only few active chimneys occur. A high-resolution bathymetry survey in the area gave indications for another sulfide site to the South of KAIMANA.

We also studied the ALPHA sulfide area, identified in 2014, in greater detail to model the acoustic backscatter characteristics of scattered sulfide fields within a larger mineralized area for improved sulfide exploration. A survey of five high-resolution bathymetry profiles resulted in a very detailed bathymetric map of ALPHA but also identified four new sulfide sites indicating a larger size of ALPHA than was previously known.

The program for the week also included the new deployment of our sediment trap and current meter mooring in cluster #04 for the fifth time. The 2900m long mooring provides very detailed information on the oceanographic and biogeochemical conditions in this part of the Indian Ocean. We also carried out a couple more wax corer

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and new dredge stations to better constrain the magmatic and geological situation at the oceanic Rodriguez Triple Junction, the unique intersection of the Central, Southeast and Southwest Indian Ridges with contrasting spreading rates and morphotectonic segmentations.

The environmental program including biodiversity sampling and microbiological studies was very successful. In the new week, we will further focus on the biggest cluster #05 of the license claim area and explore new areas for potential sulfide mineralization.

Very best regards from R/V SONNE,

Dr. Ulrich Schwarz-Schampera, Chief Scientist

Bundesanstalt für Geowissenschaften und Rohstoffe/
Federal Institute for Geosciences and Natural Resources

More information about SO271 (INDEX2019) at

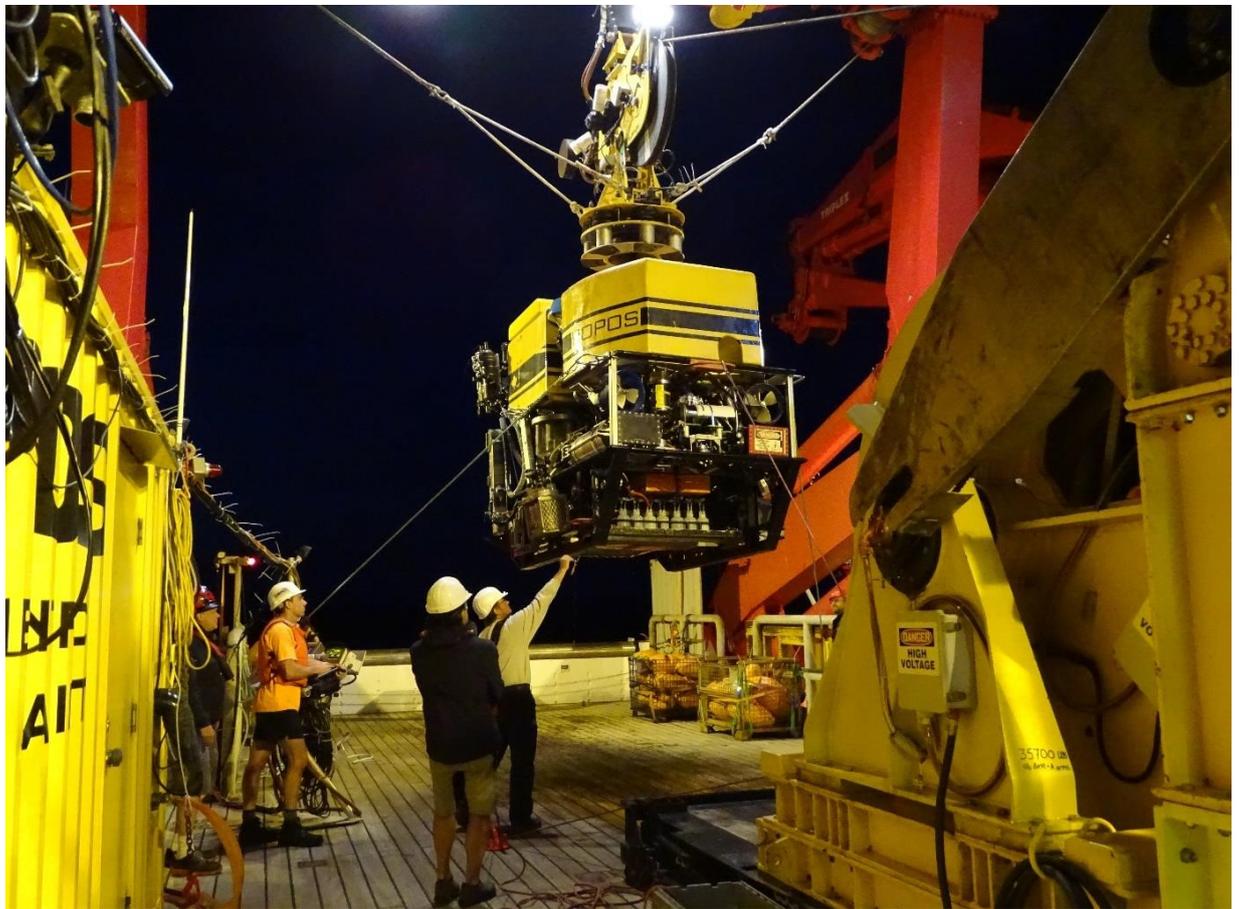
https://www.bgr.bund.de/DE/Themen/MarineRohstoffforschung/Meeresforschung/INDEX2019-Logbuch/aktuelles_node.html

<https://www.planeterde.de/logbuecher/fs-sonne-port-louis/metallsulfid-und-schwarze-raucher>

<https://www.youtube.com/watch?v=JFVe-1NqOMI&feature=youtu.be>

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Recovery of ROPOS after a dive in the KAIMANA sulfide field in license cluster #05.