

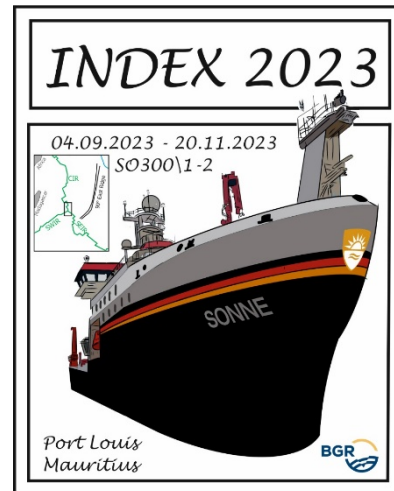
RV SONNE cruise SO300/1

INDEX2023

4 – 28 September, 2023

Port Louis (Mauritius) – Port Louis

At sea, 26°28'S, 71°42' E



Weekly Report No. 1 (04/09 – 10/09)

Expedition SO-300/1 is the first cruise leg of the INDEX2023 campaign into BGR's polymetallic sulphide license area in the Indian Ocean. Since 2015, BGR has held an exploration license from the International Seabed Authority (ISA) to explore sulphide ore deposits formed by hydrothermal processes on the southern part of the Central Indian Ridge and the northern part of the Southeast Indian Ridge. Active and inactive hydrothermal systems with their deposits are searched for, mapped, sampled, and measured with geophysical methods on research cruises to the licence area, which are carried out almost every year. In parallel, the environmental conditions and the biology of their near and far surroundings are also intensively researched and documented.

During this cruise leg, the focus will be on geophysical investigations of sulphide deposits that have already been identified in order to gain information on their distribution in the area, including under sediment cover and at depth. The many hours of high-resolution video recordings from the seabed that are produced in the process, as well as the continuous recording of numerous environmental parameters, are incorporated into the environmental studies on biodiversity in the area of the sulphide deposits.

The scientific crew consists of 13 BGR members as well as marine scientists from the Hafencity University Hamburg, the company Integrated Environmental Solutions (INES), a spin-off of the DZMB Senckenberg am Meer in Wilhelmshaven, and the Scripps Institution of Oceanography in San Diego. In addition, two geoscientists from the Philippines nominated by the International Seabed Authority (ISA) are accompanying us as trainees. As observers from the coastal state of Mauritius, we have a geophysicist colleague from the Department for Continental Shelf, Maritime Zones Administration & Exploration of the Prime Minister's office as well as two marine biologists from the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping, and the University of Mauritius on board.

After RV Sonne had arrived in Port Louis, Mauritius, on 2 September and the scientific crew of the previous cruise had disembarked with their equipment, the 22 scientific participants of SO300/1 were able to move into the laboratories, offices and cabins and set up the measuring instruments on 3 and 4 September.

On Tuesday, 5 September, Sonne sailed very punctually at 08:00 and set off in fine weather on the approx. 1700 km long transit to the first working area in the northern part of the Southeast Indian Ridge. After leaving the 12 nautical mile zone, the recording of echosoundings started in the EEZ of Mauritius, which have been mapped very little so far. All bathymetry data measured on the transits will be made available for mapping as part of the Seabed 2030 initiative.

After leaving the 200 nautical mile zone of Mauritius and Rodrigues, the EM sensor system "Golden Eye", the heart of our measurement campaign, was launched on a test basis for the first time during this cruise early on Thursday morning. A little later on the same day, a technical problem occurred with the ship's propulsion system, which resulted in a reduction of the cruising speed to 7 kn. Another short test of the Golden Eye followed on Saturday afternoon before we reached the first measurement area on Sunday morning, one day later than planned due to the reduced cruising speed.

Since noon time on 10.09., we have been surveying a large field of massive sulphides from a no longer active hydrothermal system found last year. At the moment we are using a deep towed bathymetry system in combination with a magnetometer and an attached receiver for self-potential measurements, which is towed about 50 m above the seafloor. This produces a very high-resolution map of the seabed topography and simultaneously maps areas of particularly high electrical conductivity in the subsurface.

After a short settling-in period, everyone on board is doing well and looking forward to the challenging scientific programme to be worked through over the next few weeks.

Best regards on behalf of all participants,

Udo Barckhausen, Federal Institute for Geosciences and Natural Resources (BGR)
Chief Scientist