



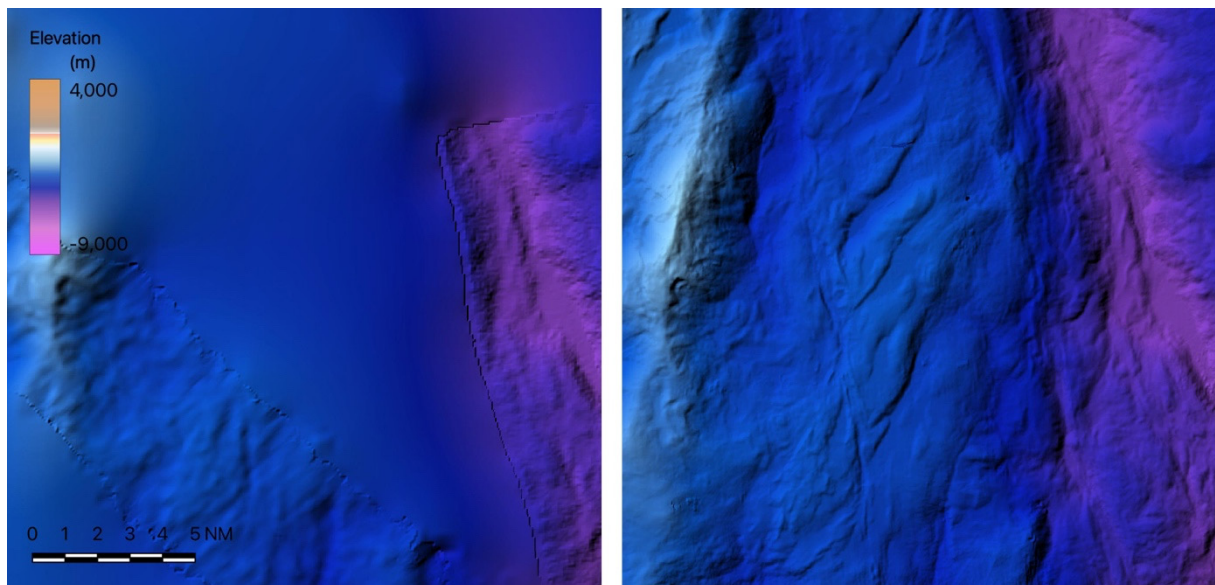
## RV SONNE cruise SO299 DYNAMET

06.06. – 29.07.2023  
Townsville (Australia) – Singapore

Weekly Report No. 4  
26.06.-02.07.2023

*At sea, 2° 50'S, 153°10'E*

On Monday 26 June we finalised our hydroacoustic profiles south of Cape St George on the island of New Ireland. The new bathymetric data not only cover almost the entire crustal block between New Ireland, Bougainville and the New Britain Deep Sea channel, but also has an impressive data detail. The morphology of the seafloor is mapped in incredible detail and previously invisible structures such as tectonic thrusts or fault structures have become obvious. On Tuesday night, we transited back to the main working area south of Lihir Island.



Comparison between the existing bathymetric data of the submarine Weiting Fault (left) and the newly acquired data of SO299 DYNAMET (right).

On Tuesday we conducted a second dive at the newly discovered Karambusel Vent Field on the western flank of Conical Seamount with the ROV Kiel 6000. We focused on mapping and documenting the vent field with its unique fauna as well as sampling the discharging fluids and gases, and we additionally collected mineralised samples and volcanic rocks. The occurrence of arsenic- and antimony-bearing sulphide minerals such as realgar and stibnite is particularly striking. During the night, three heat flow measurements were performed northeast of Conical. On Wednesday we carried out four very successful stations with the video-guided grab. Two of the targeted volcanoes were unfortunately already too sedimented to sample volcanic rocks, but south of Lihir we were able to prove the existence of another, relatively young volcano. The

olivine- and pyroxene-bearing lavas are clearly different from the other regional volcanoes sampled so far. After two more heat flow measurements during the night, we explored the southern part of Mussel Cliff on Thursday and were able to collect further interesting rock and fluid sample material with ROV Kiel 6000. In the same night, two more heat flow measurements followed on a profile between the islands of Lihir and New Ireland. On Friday, we were able to sample four elevated structures southeast of Lihir with the TV grab. These new pyroclastic samples raise new questions, as the first interpretations point to a possible flank eruption of the Kinami volcano on Lihir. However, a more detailed analysis on shore will have to be used to make better constraints on the origin of these samples. Later, we transited to the so-called Lihir Deep and collected more multibeam bathymetric data and parasound data during the night.



A jelly fish of the family of medusas captured on video by the ROV Kiel 6000 in the Lihir Deep in more than 3100 m water depth. Foto: GEOMAR/ROV-Team.

On Saturday we launched the ROV Kiel 6000 again and explored the northwestern escarpment of the Lihir Deep. There are signs of recent tectonic movements as reef carbonates, which must have formed in shallow water, are now exposed in more than 3200 m water depth. During this dive we encountered numerous jellyfish including a medusa and several comb jelly fish. In the evening we collected two heat flow measurements in the basin. On Sunday morning we successfully deployed the

three metres-long gravity corer at the same position as one of the heat flux measurements. This was followed by dredge sampling of the rocks at the Nuguria Ridge, which borders the New Ireland Basin to the northeast towards the Manus-Kilinailau Trench.

The weather is warm and humid but changing frequently with more or less intensive showers and a moderate to fresh wind from the east and south. The sea is calm and all research work so far could be carried out as planned. The participants are well and in good spirits. The interaction between science and ship is excellent as usual.

On behalf of all participants, greetings from aboard the RV SONNE,

**Philipp Brandl**  
Chief Scientist