



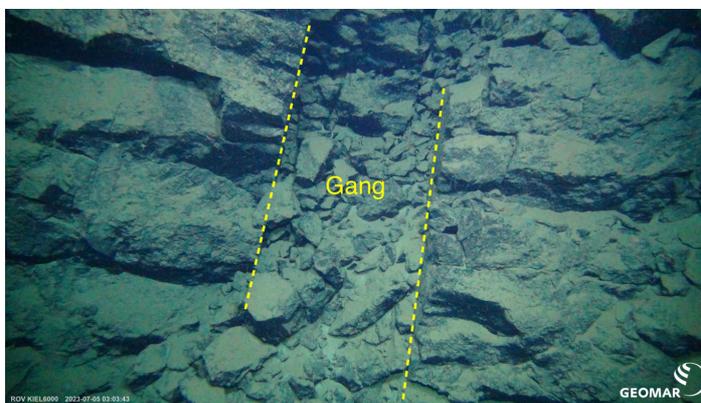
RV SONNE cruise SO299 DYNAMET

06.06. – 29.07.2023
Townsville (Australia) – Singapore

Weekly Report No. 5
26.06.-02.07.2023

At sea, 3° 19'S, 152° 38'E

At the beginning of our fifth week at sea, we continued to explore the area north of the Lihir island group. Our hydroacoustic mapping shows that the entire area between Lihir and the inactive Manus-Kilinaillau Trench seems to be a tectonically highly fragmented block. At the former Trench we carried out two dredges in up to 5500 m water depth. This was followed by another bathymetry survey. On Tuesday we stopped at Pikinini Seamount (Tok Pisin for 'the little one'), which we had discovered right at the beginning of our work as a result of the high-quality hydroacoustic systems of RV Sonne. The rocks recovered suggest hydrothermal activity in the recent geological past and we plan another ROV dive later in our expeditions to verify this further. Unfortunately, we had to postpone the heat flow stations planned for the evening due to a technical problem with the probe.



A dyke is cutting through a massive pile of lava at New World Seamount. Foto: GEOMAR/ROV-Team.

Another highlight followed on Wednesday – the dive at New World Seamount: The seamount has quite considerable dimensions of over four kilometres in diameter and 850 metres above the surrounding seafloor. Although the volcano seems to be extinct and shows no signs of active or past hydrothermal activity, we were able to observe some impressive underwater geology with the ROV. One particularly interesting feature was a vertically exposed dyke extending over several metres which must have cut through a thick stack of lava (see Figure 1). The samples are characterised by a large amount of mafic xenoliths and large amphibole phenocrysts and therefore differ from those recovered from the volcanoes south of Lihir. During the approach to the next station for the repaired heat flow probe, we also mapped the top of a much older volcano northwest of 'New World', which we therefore named Olepa Ples (Tok Pisin for 'Old World'). Overnight, two heat flow measurements followed at New World and south of Lihir Deep.

From Thursday to Saturday we recovered the ocean bottom seismometers (OBS) and ocean bottom magnetotelluric (OBMT) devices day and night, which had been deployed on the

seabed right at the beginning of our work in the area. With a total of 34 instruments, this was a tedious and technically difficult job. The strong ocean currents in the working area caused some stations to drift significantly. Therefore, five particularly exposed stations were triangulated with the hydrophones before recovery in order to calculate their exact position on the seabed. During the recovery, the crew of RV Sonne showed impressive skills and each station was recovered at the first attempt despite some wind and showers. Special thanks also goes to the crew as well as to our OBS and OBMT teams for their excellent work. All stations were back on board at 7 pm local time on Saturday evening. This was followed by two gravity core stations at Mussel Cliff and a nightly hydroacoustic survey. On Sunday, the ROV was launched again to continue mapping and documenting the Karambusel Vent Field and to collect representative fluid, gas and rock samples. We concluded this week with mapping north of the neighbouring Tanga Island group and look forward to a few more exciting days of work.



A Oceanbottom-Magnetotelluric (OBMT-) instrument surfaces with the coast of New Ireland in the background. Foto: Christoph Beier

This week, the weather remained warm but changeable with the occasional strong showers. Wind and sea continued to be kind to us and so far all research work could be carried out as planned. All participants are well and the atmosphere on board is still excellent.

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

Philipp Brandl
Chief Scientist