

# RV METEOR

## Expedition M192-1 „BRIDGEHELL“

08.08. – 08.18.2023, Piraeus – Piraeus



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### 2. weekly report (August 14. - 20., 2023)

Expedition M192-1 of RV METEOR continued successfully this week, completing mapping and sampling for the first leg of the cruise on Thursday 17. of August. We then headed back to Piraeus to use the time between August 18. to 20. to switch from the autonomous underwater vehicle (AUV) MARUM-SEAL to the remote operated vehicle (ROV) MARUM-SQUID. Along with this, part of the crew has also changed.



**Figure 1:** Main equipment this week: CTD water sampler rosette on the left, in-situ pumps on the right, and behind it the AUV MARUM-SEAL under its sun protection sail.

In the second week we continued to use the ship's multibeam echo sounder (Kongsberg EM 710). After mainly mapping the region south and southeast of Milos in the first week, this week we also mapped the regions between Milos and Antimilos, as well as west and northwest of Antimilos. Numerous hydrothermal vents were detected and mapped. Additionally, the AUV SEAL was used again. One mission on 14.08. had to be aborted due to a communication problem between AUV and ship, but the next mission in

the region northwest of Milos provided a detailed map, which will be used on the second leg to target interesting vents with the ROV SQUID.

In our study areas, we ran a total of 16 CTD stations (CTD=conductivity, temperature, density). We sampled stations, where we saw distinct hydrothermal signals in the water column with the multibeam echo sounder (probably rising gas bubbles consisting mainly of CO<sub>2</sub>). In addition to the sensor data, which indicated to us via changes in turbidity and redox potential, among other things, that we were in a hydrothermally influenced water mass, we took samples with the Niskin water bottles directly above the discharge point (about 6 m), a few meters above it, in the chlorophyll maximum zone, and in the surface water. From the sensor data and the initial laboratory measurements, we were able to determine that the fluids south of Milos are apparently more sulfide-rich and reducing than those in the active areas northwest of Milos.

In addition, four in-situ pumps were used at each of four stations. They are used to filter large quantities of water from the hydrothermal plumes and from the water column. One station without hydrothermal influence was also sampled as a background station. These filters will be used for the description of the microbial community using genetic methods and for biomarker analysis.

The 2nd week of our expedition was extremely successful as well and prepared us perfectly for the detailed sampling of fluids, sediments, rocks and fauna in the areas identified as hydrothermally active, now planned for the 2nd leg. This morning (20.8.) we left the port of Piraeus, the ROV is already set up on deck and being prepared for the first deployment, and this evening we will be back in the working area to start the station work of the 2nd cruise leg.



**Figure 2:** Group picture with the participants of the M192-1 leg.

Everyone on board continues to be well. The hospitality is fantastic, as is the nautical and technical support from the crew, without which our operations would not be possible.

With best regards, also on behalf of the rest of the cruise participants,

Solveig Bühring & Andrea Koschinsky

At Sea, 36°N, 24°E