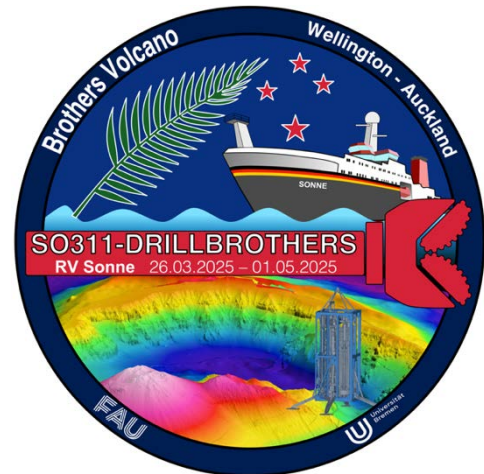


RV SONNE cruise SO311

4th Weekly Report (14. - 20.04.2025)

Happy Easter! Holy Week was dominated by storm Tam, which made it impossible to work at Brothers volcano from Wednesday afternoon. Prior to this, another MeBo well was drilled at the Healy volcano 20 km southwest of Brothers at a water depth of over 1300 meters. However, up to a depth of almost 40 m, only loose volcanic material was encountered that could not be cored. After completion of the MeBo drilling, further volcanic structures in the vicinity of the Brothers and Healy volcanoes were sampled using the chain bag dredge. On Wednesday we began the transit with FS Sonne to our other working area 280 km to the northeast around the Haungaroa volcano. The weather forecast for this region was slightly better than for the area around Brothers.

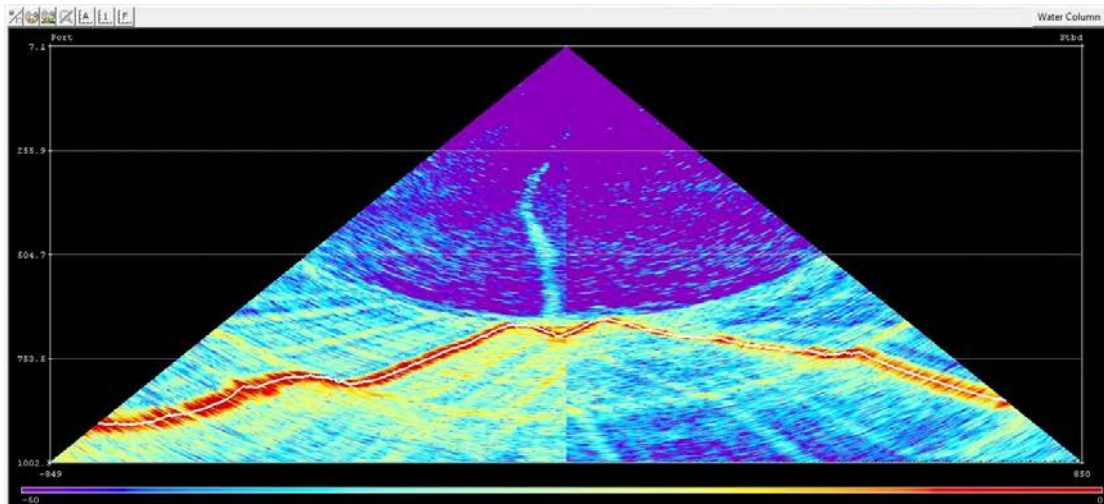


The stormy seas made working in the second half of Holy Week a challenge. Photo: Fabian Hampel

Over the course of Thursday, the disturbance caused by the storm and swell became so severe that we had to suspend all station operations and go into “weather mode”. But by the afternoon of Friday, the chain bag dredge could be used again to recover rock samples from Haungaroa. This volcano had already been visited during the SO253 cruise. During this research cruise, previously unknown hydrothermal vents were discovered and sampled by

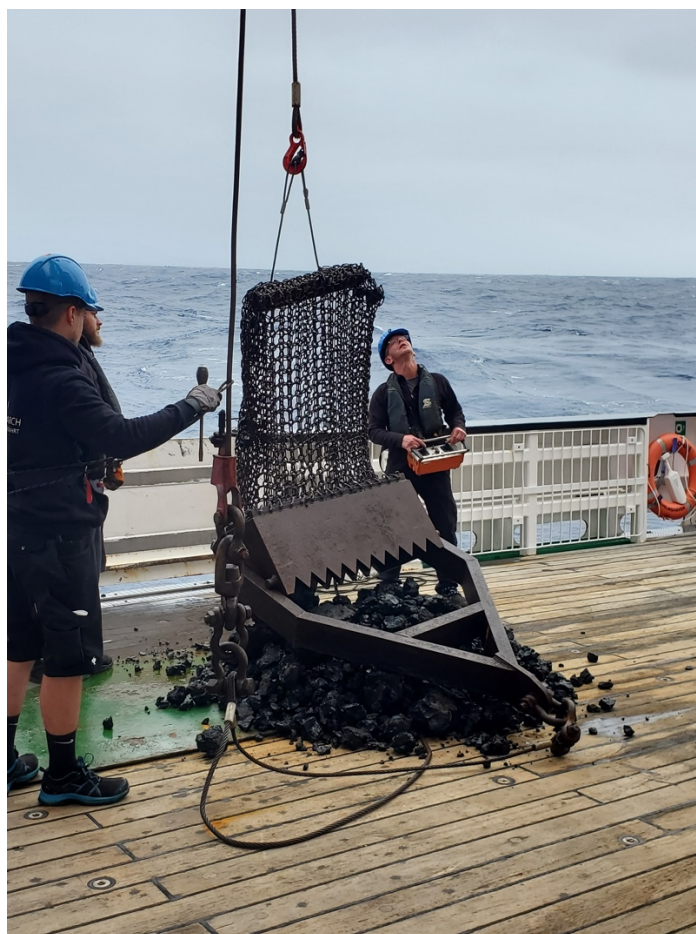
the MARUM Quest 4000m submersible was for the first time. We left Haungaroa on Saturday evening after locating the hydrothermal vents and sampling the overlying water column. The outlets of hydrothermal solutions and volcanic gases were clearly visible in the solar multibeam echo sounder.

Our next destination was the volcano Ngatotoirangi (brother of Haungaroa and also a legendary figure from the early settlement history of New Zealand by the Māori), which lies roughly halfway between Haungaroa and Brothers.



In the summit area of the Haungarao volcano, hydroacoustic anomalies indicate the escape of volcanic carbon dioxide, which rises in the form of gas bubbles through the water column. The image shows such a gas plume that can be traced from the bottom at 680 m to a water depth of 260 m.

In still stormy seas, several dredge deployments were carried out there all of which brought



The contents of a chain bag dredge are expertly unloaded on the working deck of the Sonne. Photo: Fabian Hampel

very interesting petrological rock samples on board. One dredge also contained large chunks of elemental sulphur. The smell of rotten eggs (due to the release of hydrogen sulphide, H_2S) and the colonization by deep-sea mussels, which live in symbiosis with H_2S -oxidizing bacteria, indicate hydrothermal activity. Using the multibeam echosounder, rising gas bubbles like at sister volcano Haungarao could not be clearly detected. However, acoustic anomalies were identified in the water column and these domains were sampled with the CTD water sampler. If possible, we will try to identify the suspected vents with the video system of the TV-guided grab and to take targeted samples.

In the meantime, the storm has calmed down a bit and a deployment of the TV-guided grab is planned for tomorrow. Tonight we will return to the

Brothers volcano and continue the sampling there next week, which had to be interrupted by the approaching storm Tam.

The galley and service spoiled us over the holidays with delicious food and festive decorations. Everyone is in good spirits and looking forward to the calmer weather and the sight of the sun, which had been rare in recent days.

With best wishes, also on behalf of all those on board,

Wolfgang Bach