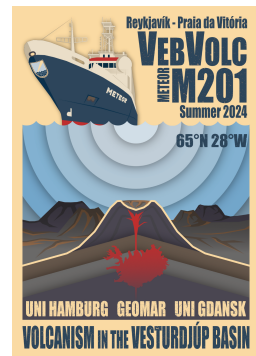


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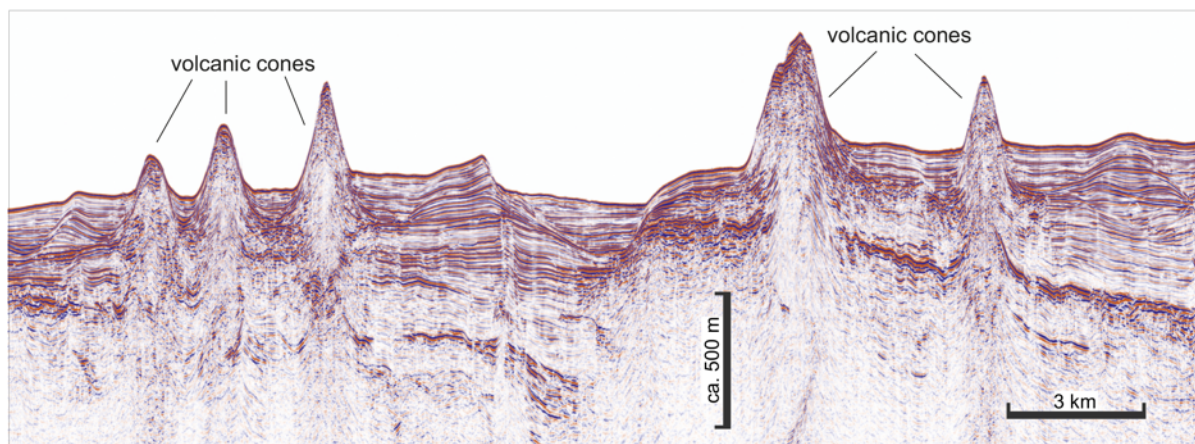
Expedition M201 VebVolc

09.06. – 18.07.2024 | Reykjavik – Praia da Vitoria



3. Weekly Report (17. - 23. June 2024)

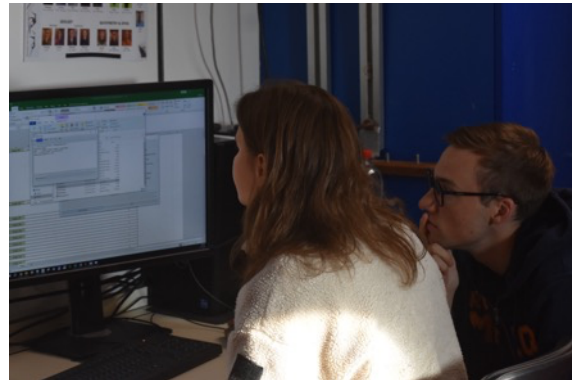
During the last week, we had our longest seismic survey of expedition M201, which started on 15 June and ended six days later on Friday morning, 21 June. During this survey, we recorded reflection seismic data along an S-N profile over the volcanic cones of the Vesturdjup Basin. Also, we covered the northern Basin in several long E-W and N-S lines to understand the hidden volcanic, sedimentary, and basement structures. The reflections under the seafloor of the Vesturdjup Basin tell an unexpected and complex history that we are slowly beginning to understand. Episodes of volcanic activity and complex bottom-water currents shaped fascinating structures that are now buried under layers of marine sediments. The prominent volcanic cones root stratigraphically under only 100 – 200 m thick sediment layers, which shows that they are significantly younger than the underlying oceanic crust. An exact age estimate is difficult at this phase of the work, and needs some more detailed analyses of the seismic data, the sediment cores, and rock samples.



The reflection seismic cross-section image shows five underwater volcanoes that are 2-3 km wide at the base and several hundred meters high. This cross-section is stretched vertically by a factor of about 6. The undulating structure of the deposits between the volcanoes is the result of oceanic currents. © Marine Geophysics Team, University Hamburg

Seafloor sampling in the northernmost area of the Vesturdjup basin began Friday morning after the reflection seismics equipment was recovered. Although the weather picked up during the night from Friday to Saturday with strong winds and waves of up to 4 m, we effectively performed six dredge tows and five sediment coring stations. The rock dredges collected plenty of samples, again including a large portfolio of drop stones. Coring was more difficult as the sediments are compact and coarse, not allowing deep penetration for our 1.2 tons gravity corer. This may be due

to the strong bottom currents in this area, by cold deep-water masses coming from the shallower Denmark Strait, flowing down to the deeper Vesturdjup Basin like an invisible underwater waterfall, which redeposit the finer particles.



Left: Preparation of the seismic streamer during on the working deck. Right: During the seismic (and magnetic) surveys, the incoming data are quality controlled and post-processed by our geophysicists team which is essential for the planning of seafloor sampling, additional profiles. © J. Preine

However, we got two good sediment cores with about 2.5 m recovery, which were opened, described, and subsampled in detail to get information about, e.g., bottom currents and sedimentation rates. Because the waves did not calm down as fast as predicted, we could not do the planned OFOS stations for video and photo observations. Instead, we started a planned seismic survey earlier and postponed the OFOS observations when the weather forecast shows better sea conditions mid-next week. Therefore, we are now on our third seismic survey, which will last about three days.



North Atlantic in summer: Strong winds and rough seas during Saturday are calming only very slowly but made OFOS work impossible for Sunday. © N. Augustin

All participants are doing well, and the atmosphere on board is excellent.

On behalf of the M201 science party, greetings from aboard the RV METEOR,

Nico Augustin

Chief Scientist