



RV SONNE Expedition SO316 CAVA Tephtras

21.11. – 26.12.2025

Balboa (Panama) – San Diego (USA)

5. Weekly report (15.-21.12.2025)



On 15 December, the reporting week began with bathymetric and Parasound surveys, which served to prepare the subsequent operations off the coast of Mexico. Based on these data, suitable working areas were identified. On the same day, the first 2D seismic profile was acquired using a streamer and air gun.

On 16 December, the first targeted seafloor sampling was carried out using a gravity corer. Following the evaluation of the Parasound data, a suitable station was selected and a sediment core was successfully recovered. In addition, a sound velocity profile was recorded. Furthermore, an online outreach event took place on this day, during which 68 school classes from all over Germany were given insights into the ongoing expedition via Zoom.

The seismic work was continued on 17 December with another long 2D seismic profile. On 18 December, seismic operations were completed as planned in the afternoon. Subsequently, sediment sampling with the gravity corer was initiated. Before that the ship's winch was successfully tested to ensure the operational readiness of the newly installed equipment.



*Left: Skeleton shrimp, sampled from ship's filter; Right: Brittle Star from MUC, sampled at the mud/surface interface.
Photos: Liseth Pérez*

On 19 December, a multicorer and an additional gravity corer deployment were carried out in the early morning hours. As the final scientific activity, a last gravity corer deployment was conducted in the afternoon of 19 December. Afterwards, the transit towards Acapulco (Mexico) was initiated. On 20 December, the vessel arrived in Acapulco (Mexico). There, three scientists and two technicians disembarked. Subsequently, the transit towards San Diego (USA) was started where the cruise ends.



Left: RV Sonne in Acapulco, Photo: Alejandro Cisneros; Right: The Blubb and the seismic source during sunset, Photo Heiko Jähmlich

After 26 eventful days of work, it can be concluded that the RV SONNE expedition SO316 was a great success. We collected about 5000 kilometers of hydroacoustic data in the working area and we acquired about 1700 km of high-resolution seismic profiles of excellent quality. We also collected geological samples at 25 stations with ~200 meters of total recovery. With the hydroacoustic/seismic profiles and the geological samples we will be able to establish time series for the explosive volcanism of Central America and S-Mexico for the uppermost Pleistocene, as well as to investigate the structure of the continental margin in relation to volcanism (e.g. distribution of thicker ash layers) and tectonics (e.g. bent faults, slope-trench-incoming plate profiles). The new data will allow us also to submit an IODP3 full proposal to have deep coring in the working area and to extend the role of ash alteration on diagenesis and microbiology by detailed analysis as well as answering the question if and how explosive volcanism may be controlled by external processes like climate and tectonics.

The scientific party of RV SONNE Cruise SO316 gratefully acknowledges the very friendly and most effective cooperation with Captain Birnbaum and his crew. Their great flexibility and their perfect technical assistance substantially contributed to make this cruise a scientific success, especially during the recovery and repair of the winch. We would also like to thank the German embassies in Guatemala and Mexico as well as the Guatemalan embassy in Germany for their help during the last-minute research permits and the issuing of the Mexican working VISA. We also appreciate the valuable support by the Leitstelle Deutsche Forschungsschiffe (German Research Fleet Coordination Centre) at the University of Hamburg before and during the cruise.



Expedition SO316 participants, Photo Merlin Pleuler

All participants are doing well and are looking forward to the Christmas days. The chief scientist sends christmas greetings on behalf of all the scientific participants.

Steffen Kutterolf (GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany)