

Forschungsfahrt des FS SONNE **SO 314**:

T-SECTOR Southeast Pacific Rise

13.08.2025 (Papeete/Tahiti) –
05.10.2025 (Antofagasta/Chile)



Scientific Cruise SO 314, 6. Weekly Report: 15.09.-21.09.2025

To complement and finalize the refraction seismic profile of Expedition SO314 that has received funding by the European Union's Horizon Europe ERC Synergy Grant programme under grant agreement No 101071713 – T-SECTOR, all ocean bottom seismometers (OBS) were deployed on the 13th and 14th for the third and last time. In order to recover basaltic glass particles from the areas of the SEPR not covered by sediments the wax corer was successfully deployed several times between midnight and afternoon of the 15th. Subsequently the measurements for the refraction seismic profile were started on the 15th and completed on the 16th directly followed by the release and collection of the first OBS on the 16th. The collection of the OBS in westerly direction was interrupted in the morning of the 17th to obtain two further long gravity cores extending the gravity core profile to the east.

In the morning of the 18th a second attempt was made to recover the OBS with the OFOS and grapnels attached to it, which unfortunately did not work because the OBS had sunk too deeply into the sediments so that the grapnels could not get underneath the OBS and introduce the hook into the frame. An alternative way that was pursued during the same OFOS dive using a Y-shaped frame to catch the rope of the float of the OBS was finally successful and the OBS could be brought back safely to the surface and onto the vessel (Fig. 1). This endeavor was enabled by the collective engagement of the entire crew, in particular the metal workshop on board and the unique navigating skills of the boatswain, the helmsman of SONNE, and the OBS experts of GEOMAR.

Subsequently the sediment sampling with the gravity corer and the multicorer was continued on the western flank of the SEPR from midday of the 19th to the night of the 20th to increase the density of the sediment core locations and finalize the section on the western flank, which will in the end enable the establishment of a composite time series of the sediments directly above the basement of the past approximately 1 million years on both flanks of the SEPR.

For comparison to the records of past volcanic activity a survey with a camera sledge was performed above the central part of the spreading centre of the SEPR to look for visual evidence of present day volcanic and hydrothermal activity at the ridge in the morning of the 21st (Fig. 2).

Greetings from Martin Frank (Chief Scientist SO 314), Heidrun Kopp (Co-Chief Scientist SO 314) and the entire team and crew of SO 314.



Fig. 1: Recovery of the red OBS that could not be released (immediately below the surface) below the camera sledge OFOS. Below the OFOS the three grappels and the Y-shaped frame are visible, with which the OBS could finally be captured at its yellow float in 3000 m water depth.



Fig. 2: Photo of the newly formed basaltic crust and typical pillow lavas taken with the video camera of the OFOS above the active spreading centre of the SEPR in 3000 m water depth.