

5. Weekly Report FS Sonne So261
Expedition „HADES“
26.03. – 02.04.2018



During the last week of our expedition we were able to sample at the sixth hadal site. On Tuesday 26 we reached our northern most site. During the next two days we performed our water column and sediment sampling at this site and deployed our different lander system for the last time at hadal depth. In total we have investigated the Atacama-Trench axis along a ca 450 km long transect. This allows us to assess the biological activity in the hadal Atacama Trench sediment and to evaluate local variability in the benthic mineralization activity in one of the deepest trenches on Earth. First on board results from all sites at the Atacama Trench axis indeed show highly elevated benthic oxygen consumption at the trench bottom as compared to abyssal settings and confirm that trenches are biological hot spots. However, the measurements also show an unexpected high variation in biological activity within the trench indicating local variations in the delivery of organic matter. We speculate that two main processes are responsible for this pattern, i) variation in surface production and thereby vertical deposition and ii) downslope mass vesting events driven by seismic activity. On March 28 we completed the second reference site at 4050m water depth with the recovery of our lander systems. In total we have managed to sample, besides the hadal sites, at three reference; two in the south of our transect and one in the north. In the evening of March 28 we left our working area towards Guayaquil. During the four days of transit we were able to finalize all onboard analyses and packing is almost completed. On Monday April 2 we will enter the port in Guayaquil. Overall So261 was a very successful expedition bringing 40 scientists from 17 nations together to work concerted on the diversity and functioning of the Atacama Trench ecosystems. Using this multidisciplinary approach in comparing carbon and nutrient fluxes, the connection, composition and structure of communities from the water column to the seafloor using up-to-date methods and technologies, we will improve our knowledge on hadal ecosystems in general.

The scientific party of So261 is grateful to the master and crew of RV Sonne for their excellent assistance that made this expedition a great success.

All the best from the SONNE crew and the scientific party of So261,
Frank Wenzhöfer



Figure 1: Scientific party of the Sonne cruise So261 (Photo: Stefan Meinecke; xxXX: Manfred Schlösser)