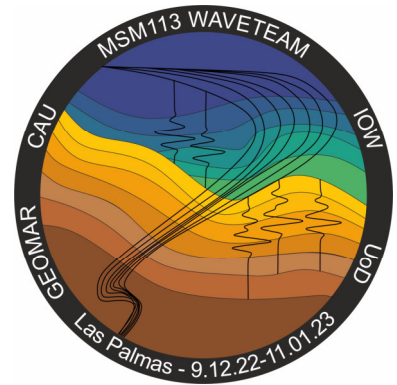


RV Maria S. Merian
Cruise MSM113 (GPF 21-/032 and 22-2/024)
09.12.22. – 12.01.23, Las Palmas – Las Palmas
Weekly Report No. 3, 19.12. – 25.12.2022



**Sediment wave generation in continental margins
(WAVETEAM)**

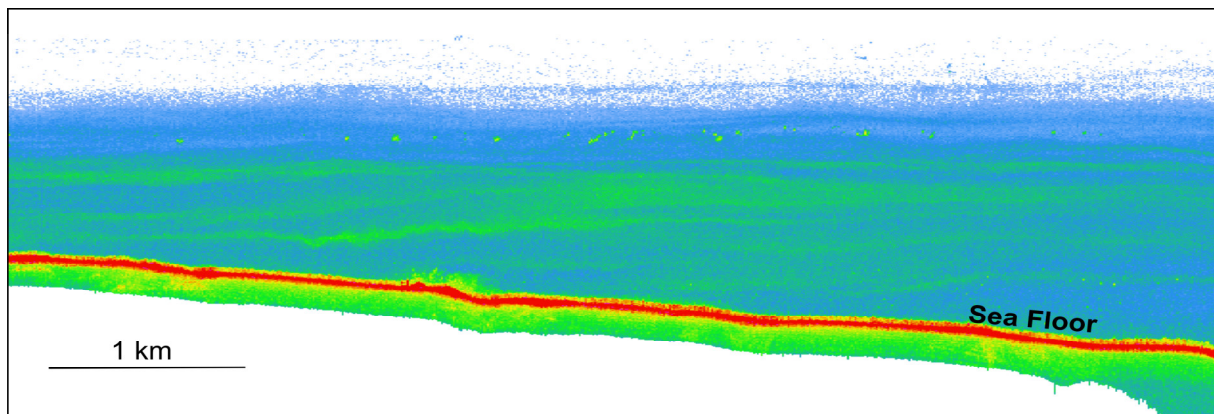
**Structure of the submerged mobile western flank of
Cumbre Vieja Volcano, La Palma (Sub:Palma)**

A busy and successful week is behind us. After gravity coring at three locations on December 18, we surveyed previously poorly mapped areas of the slope with the vessel's hydroacoustic systems until noon on December 20. Large sediment wavefields are interrupted by deeply incised canyons at various locations. We interrupted the survey for one CTD cast. In the early evening of December 19, we had to adjust the planned profiles on short notice because numerous fishing vessels were operating in our working area. Fortunately, the fishing vessels left the area in the late evening of December 19, and we could continue to work more or less 'undisturbed'. We took samples with the giant box corer at three locations on the afternoon of December 21. The first location of the giant box corer was on a small mound at the edge of a sediment wave in about 750 m water depth. Several such small mounds are found in this area. After a CTD at this location, the giant box corer came up well filled containing soft sediment as well as numerous fragments of cold water corals. We had already suspected that the mounds were accumulations of cold water corals. To our knowledge, this site is not marked in the maps showing the distribution of cold water corals along the margin. We took the other two giant box cores at sites where gravity coring resulted in very little core recovery. This was primarily in the troughs of sediment waves. The giant box corer brought relatively little sediment on board at these locations as well. The sediments are extremely consolidated.



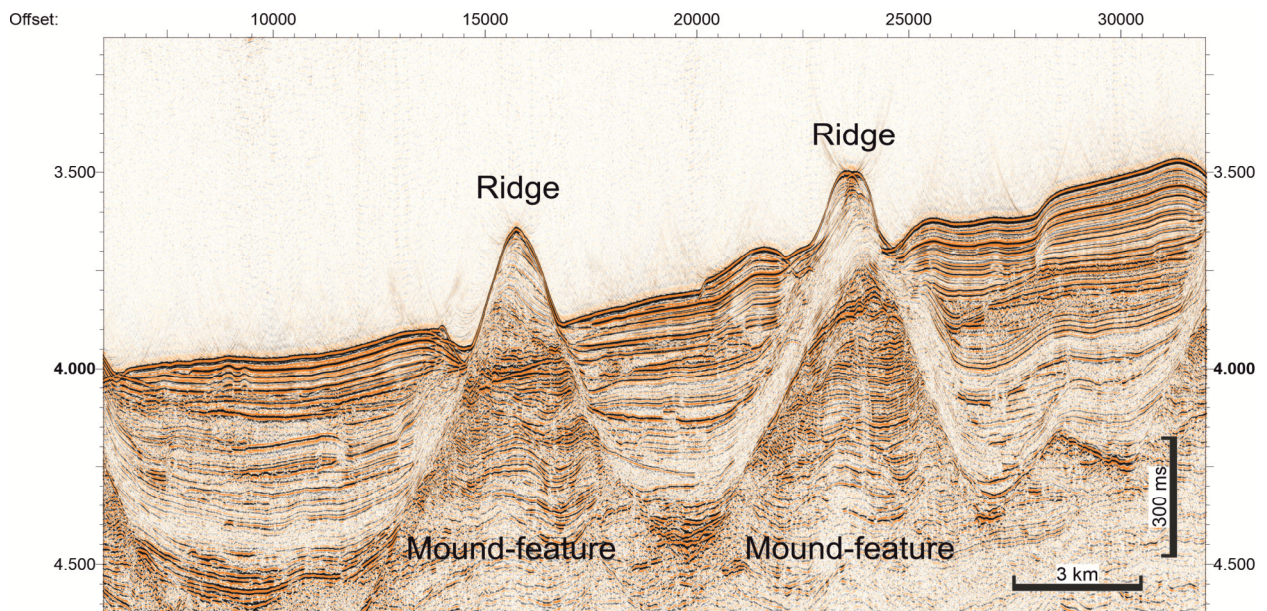
Left: Sampling of a giant box corer. Right: Cold water corals from a giant box corer from about 650 m water depth.

The night of December 21 was used for a CTD profile across the continental slope. CTDs were collected close to the sea floor at eight locations in order to document the stratification of the water column. We also had time to look a little closer at the water column data in the meantime. We can see very clearly water mass boundaries and internal waves especially in the EM712 multibeam data. The detailed analysis of all data will allow a joint interpretation of processes in the water column and the sediment architecture, which is the main objective of the cruise.



EM712 water column data showing internal waves.

We took three gravity cores across one of the canyons in the working area on December 21. The first core was on a terrace about 300 m above the canyon thalweg. The core recovery was more than 8 m. The other two cores were located at the canyon thalweg and on a terrace about 20 m above the canyon thalweg. Both cores contained very coarse material. Core recovery was in the range of one meter. This indicates that this and other canyons in the working area are active pathways for sediment transport from the shelf to the deep sea. The night and subsequent day were used for another hydroacoustic survey. The survey was interrupted for a CTD and a giant box corer in an area where the bathymetric data show numerous small mounds on the seafloor. The giant box corer contained lots of cold-water corals. On December 23, we retrieved the moorings that we had deployed at the beginning of the cruise. We triangulated the location of the moorings before retrieval. The retrieval of the moorings went smoothly and both moorings were on deck before lunch. Seismic equipment was deployed after recovery of the moorings for last slope-parallel profiles in the first working area. Profiling was continued until the morning of December 24.



Example of a seismic profile. Large mound-like features are imaged beneath ridges, which are exposed at the sea floor. We will be able to tie the age model from existing scientific drill-sites to this section, and therefore to assign an age to the boundary between the mound-like features and the sediments deposited above them.

During the morning, another CTD cast was acquired for the calibration of some of the sensors installed at the mooring. After a final short hydroacoustic survey, we started a ~24-hour transit to our northern working area in the early evening on December 24. The second working area is the Agadir Canyon region. Even though we continued to collect hydroacoustic data during the transit, everyone on board had the opportunity to get some rest for Christmas Eve. We had a barbecue on deck at perfect weather conditions. Santa Clause brought presents for everybody and a nativity play was performed by the scientific crew. Today we had a delicious Christmas menu with goose and duck or baked vegetables as a vegetarian option in the festively decorated mess room. We would like to thank everyone on board and especially the galley crew who made this great Christmas possible.

With best regards from RV Maria S. Merian

Sebastian Krastel

(Christian-Albrechts-Universität zu Kiel)

On board, 29°14'N, 011°38'W



Christmas impressions from RV Maria S. Merian: 'Gingerbread houses', Christmas tree and the scientific crew during Secret Santa