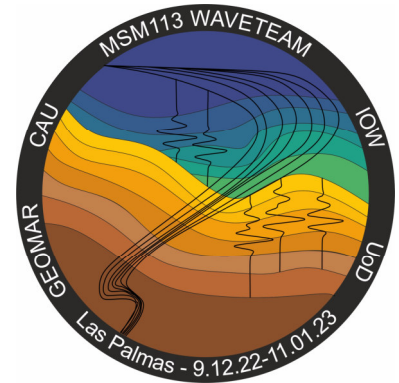


**RV MARIA S. MERIAN**  
**Cruise MSM113 (GPF 21-1/032 and 22-2/024)**  
**09.12.2022. - 12.01.2023, Las Palmas - Las Palmas**

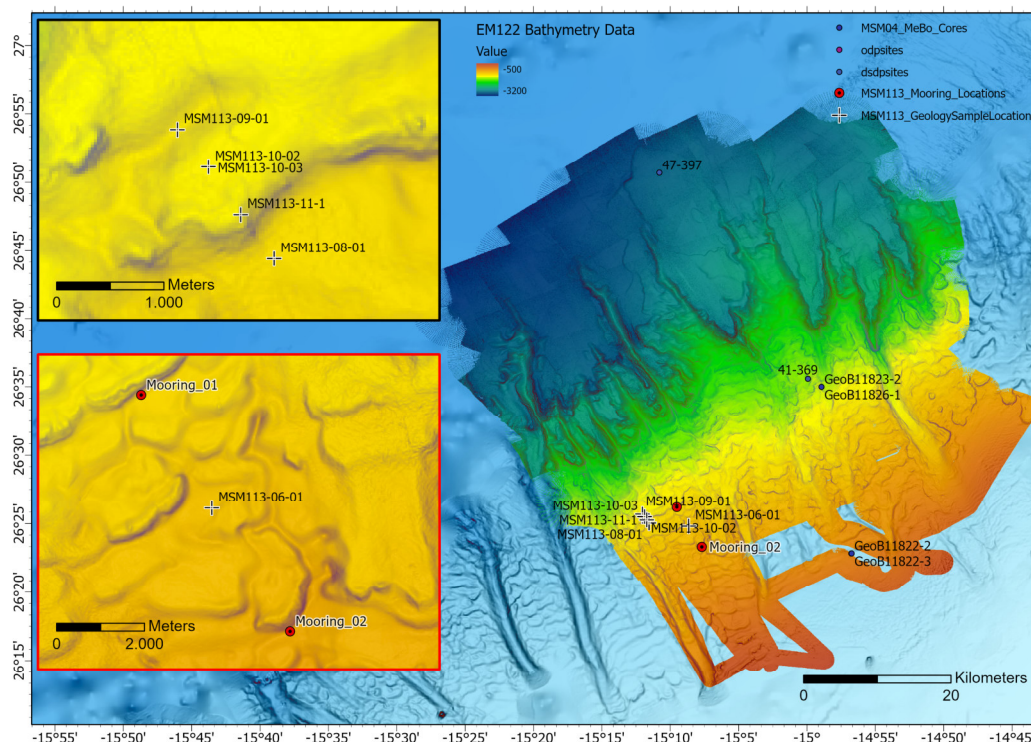


**Sediment wave generation in continental margins (WAVETEAM)**

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

**2<sup>nd</sup> Weekly Report (12. - 18.12.2022)**

After the successful deployment of the moorings last Sunday in our first working area off Cape Bojador about 150 km south of the Canary Islands, we started detailed surveying and sampling in the vicinity of the moorings. This area has long been under scientific investigation since the early 1980s. Available bathymetric data from the area reveal pronounced sedimentary waves at the upper to lower slope in between 300-2500 m water depth. Although two DSDP drill sites (DSDP 41-369, DSDP 47-397) are located at the lower slope, no data exist on the shallow subsurface and the corresponding sedimentary succession. Hydrographic and oceanographic data in this area show that the composition of the water masses is complex. Several studies indicate the presence of strong internal waves that occur at depths of 500-1000 m within the water column.



*Fig. 1: New bathymetric data including the locations of the moorings and the geological stations .*

We collected our first hydroacoustic data during the night of December 12. Numerous other data have been added during the week. The new data have much higher resolution than previously available data and show the complex morphology of the continental slope. The waves are irregular and appear to overlap, with at least two preferred directions. Several canyons interrupt the sediment wave fields. Prominent ridges are imaged on the lower slope.

On December 13, we took a first sediment core on a sediment wave between the two moorings. Sediment recovery was 8.72 m in a 10 m core barrel. Hence, this first core was very successful. We started the first seismic survey at noon. The first profile crossed the two mooring sites. We connected this line to the two DSDP sites in the working area to correlate the reflectors with the well to get ages for individual reflectors. We are currently processing the lines and will show initial results in next week's report. In parallel, we are also recording water column data. The moorings were clearly visible in the water column data.

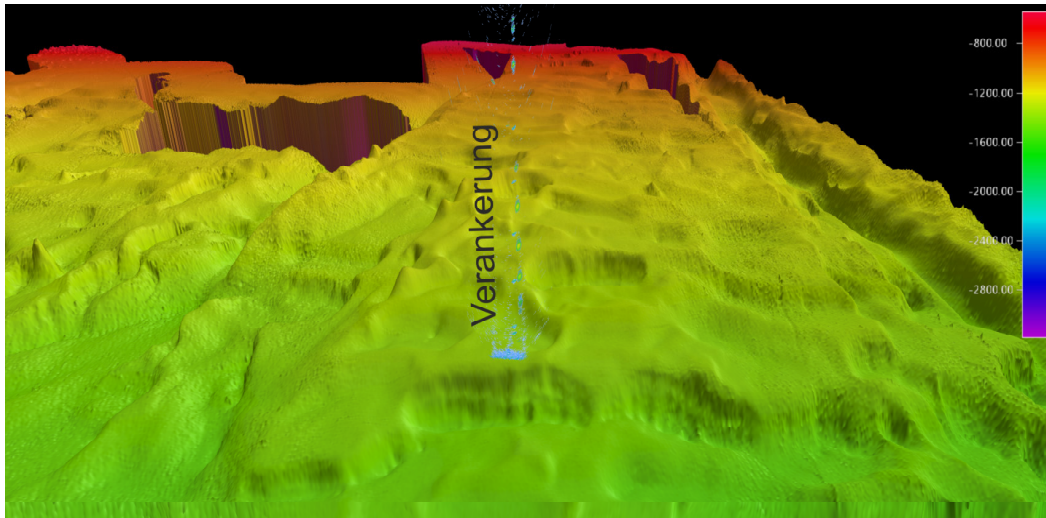


Fig. 2: Water column data image the floatation of the moorings.

December 14 was entirely devoted to geological sampling. We took 4 cores over the sediment wave on which one of the moorings is placed. The first three cores were extremely successful, yielding around 9 m of core recovery each, so the geological team had their hands full cutting the cores into 1 m segments, labeling them, and conducting initial core descriptions and sampling. The fourth core that day was located directly beneath a sediment wave. Parasound data indicated older layers at the surface at this location. Core recovery here was only about 1 meter because the material is consolidated and also contains a lot of sand. However, this information is extremely important for us to document the small-scale lateral changes in the depositional patterns and to reconstruct the genesis of the sediment waves.



Fig. 3: Core on deck.



The night of December 15 was used for additional hydroacoustic measurements. After a CTD on the morning of December 15, we recorded 15 parallel closely spaced seismic profiles over the locations of the moorings to image lateral changes in the internal structures of the sediment waves. We again connected this grid with a line to DSDP site 369. After retrieving the seismic system on the morning of December 17, we geologically sampled the upper slope. There, the sediment waves are much more regular. Three gravity cores yielded very good core recovery. Overall, the material in this area is sandier than on the middle continental slope. After another night of seismic surveying, we now have a busy Sunday ahead. We are planning three gravity core stations on the lower continental slope in order to quantify the gravitational sediment transport in the working area.

We are all well on board. We have fortunately remained Corona-free on this cruise, so that we have now been without testing and masks for several days. Despite the sun and the warm temperatures, we also notice on board that it is not long until Christmas. There are not many doors left closed in the Advent calendars and tomorrow the Christmas tree will be decorated in the mess room. It will be the first Christmas on board for most of the scientific team. We wish everyone a peaceful and restful holiday season and look forward to seeing what Christmas at sea will bring.

With best regards from RV Maria S. Merian

Sebastian Krastel

(Christian-Albrechts-Universität zu Kiel)

On board, 26°39'N, 015°10'W

