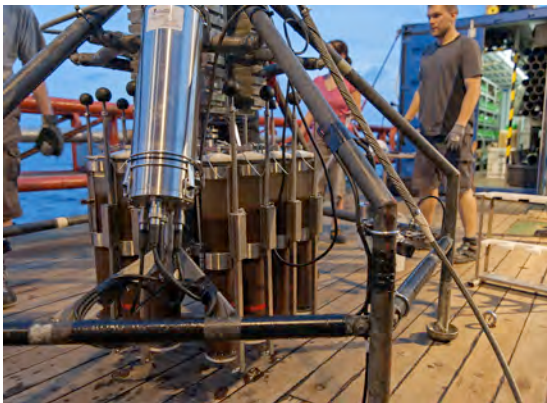


	<p>SO225 MANIHIKI II Weekly Report No. 2 (26.11. – 02.12.2012)</p>	 <p style="text-align: center;">R/V SONNE 08°18,3'S / 164°29,6'W</p>
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In the night from November 25th to 26th, R/V Sonne arrived at the so-called Western Plateaus, which represent the western part of the Manihiki Plateau. We headed for a seamount, which has already been investigated on cruise SO193 in 2007. The data compiled on that cruise show that the top region of this seamount is a large plateau covered by thick sediment layers. Here, we conducted the first coring station of our cruise in 1,500 m water depth. Such relatively shallow stations are of great interest for the paleoceanographers as at shallow water depths carbonate shells of planktonic micro fossils (foraminifera) are well-preserved and thus, allow to reconstruct environmental conditions during the past. At each coring station, we commonly deploy one to two piston corers to recover sediment cores as long as possible. Additionally, the multi-corer is run to sample bottom water and the sediment surface, which is usually destroyed in the cores recovered by piston corer. At the first station, unfortunately, the foraminiferal sand turned out to be difficult to sample as it was easily washed out during heaving of the sampling tools. Finally, we managed to obtain a core as well as samples from the sediment surface. Furthermore, we sampled and analyzed the water column in various depths from the ocean floor up to the water surface using a CTD (Conductivity, Temperature, Density) and a rosette water sampler.



Samples of the sediment surface yielded with a multi-corer (photo: Torsten Bierstedt).



Scientists investigate sediment cores and rocks in the geology lab on board R/V Sonne and prepare them for subsequent shore based research in the home institutes (photo: David Poggemann).

During the following days, we gave priority to further coring stations located on a N-S-profile across the western plateaus, since a dive with the remotely operated vehicle ROV Kiel 6000 had to be cancelled due to unforeseeable technical problems. Sediment sampling at these stations was very successful and yielded up to 16 m long sediment cores. First core logging methods conducted on board show that even in the equatorial West Pacific Warm Pool area the lithological changes are quite prominent, pointing to pronounced variations in the ecosystem in response to oceanographic and climatic changes during the Pleistocene. Furthermore, we discovered millimeter-sized lithogenic particles of most likely volcanic origin in only a few centimeter sediment depth. Because of their size and density, such particles were neither drifted by currents nor transported by wind over long distances. We presume that they originate from volcanic eruptions nearby the location where they were deposited. Volcanism during the Late Pleistocene, however, has not yet been described for the area of the Manihiki Plateau.

On Friday, November 30th, R/V Sonne sailed back to the Danger Island Troughs, where several ROV dives were scheduled. The Danger Islands Troughs are a large fault-bounded series of an echelon bathymetric depressions, named after the atolls at its southern end. The basins strike north-south, bifurcate the Manihiki Plateau into the High Plateau to the east and the Western Plateaus to the west, and consist of deep, elongated basins with water depths as deep as 6,000 m. From SO193 we know that thick lava successions are exposed along the steep slopes of the basins. These lava successions are the main target for stratigraphically controlled ROV sampling in order to reconstruct the temporal and compositional evolution of the Manihiki Plateau.



Rock sampling in 3,500 m water depth using ROV Kiel 6000. A conventional chisel held by the manipulator of the ROV turned out to be the optimal tool for rock sampling.



The manipulator of the ROV recovers a rock sample from the eastern flank of the Danger Island Troughs.

In the morning of December 1st, we were able to conduct the first ROV dive of the cruise thanks to the tireless commitment of the GEOMAR ROV team. The dive covered a depth profile extending from 3,500 to 3,000 m water depth across the steep upper slope of the central basin of the Danger Island Troughs. The images taken by the ROV from the sea floor reveal a spectacular rough landscape, which is dominated by sheet and pillow lavas, volcanic breccias, dikes and debris consisting of lava blocks. The *in situ* rock successions are just right for the planned systematic sampling, but turned out to be extremely solid and robust. Nevertheless, we were able to recover rock samples thanks to the skillful handling of the manipulator by the ROV pilots. The samples comprise dense lavas and also, somewhat surprisingly, highly vesicular volcanics. We are optimistic that we will complete our sample set during the upcoming days by further dives.

The last week also let us recognize that the sun does not always shine in the equatorial Pacific. Quite often short, but very intense rain showers surprised us. This and the burning heat makes work on the aft deck somewhat unpleasant. Overall, we enjoy the warm tropical evenings with now and then spectacular sun sets. All participants are well and send greetings to everyone at home.

For all cruise participants
Reinhard Werner