2nd Cruise report (May 2 to 9, 2016)

SONNE SO248 "BacGeoPac" 01.05.2016 (Auckland, Neuseeland) – 03.06.2016 (Dutch Harbor, Alaska, USA)

After one week cruising since the departure from Auckland we arrived meanwhile at station 4 at 10° 30' S and 176° 30' W, far away from all continents and islands in the middle of the central Pacific. We steamed east of the Fidji Islands and thereafter in sight of the Island of Futuna, belonging to French Polynesia. This was the last view on land for the next two and a half weeks, because until we reach the Aleutian Islands the only islands in the greater vicinity of our cruise track is the Hawaiian archipelago, still around 1000 nautical miles away.

The journey so far was without any problems and we sampled four stations. One of the stations we wanted to visit, located in the exclusive economic zone of the Fidji Islands, had to be cancelled because despite an application in time we did not obtain any response from the Fidji authorities. Hence we had to cancel one of the stations at every fifth degree latitude we had planned to visit until the equator, that at 20°S. So we had roughly two and a half days steaming time and crossed a storm of Beaufort scale 8 and waves of 4-6 m height in the region of the south east trade winds. Sonne was still pretty stable in the water, thanks to the stabilizers. The water temperature increased quite a bit since station 1, from 23°C to 30°C at station 4. The air temperature is similarly high and the humidity as well. Thanks to the well air-conditioned ship it is quite comfortable on board. The water is already very clear since the first station. Our biooptics group of Daniela Voss measures at every station the transparency of the water by the so-called Secchi depth with a white disc of a diameter of 90 cm. Therefore, the disc is lowered into the water column until it cannot be seen any more. This was the case at all stations only at depths of 40 and even 50 m.

At our first station at 30°S we tested very successfully all instruments for collecting samples in the water column. We were particularly happy that the new large-volume CTD rosette worked without any problems right away. Prior to the cruise there was time only for a quick check of its functionality in the Jade Bay. It already proved its most valuable usefulness at every sampling. I would like to express my deep thanks to Thomas Badewien and his team for the thoughtful and excellent work at designing and constructing this important core instrument for oceanographic work. Due to the large amount of water of the 24 bottles of a volume of 20 liter each we obtain so much water in one "shallow" (down to 1000 m depth) and one "deep" (down to the sea floor at more than 4000 m and further on even down to 6000 m) cast that so far we can fulfill all water requests, even those of the very "thirsty" groups on board. Only now and then we need to run an extra CTD to fulfil special requests for extra large amounts of water.

Also towing a plankton net at the surface with twin nets (Bongo net) worked at the first try. Using this net one group on board wants to collect microplastic at the surface and to study its abundance and microbial colonization. However, so far the water is so clear and pristine that no single piece of plastic was trapped in the net.

At station 2 at 25°S we tested very successfully the new multicorer (MUC) to sample surface sediment. All plastic tubes were filled with brown, soft sediment. Unfortunately, one of the eight tubes including its fixation did not return on deck so that Bert Engelen and his team need to continue working with seven tubes to investigate the bacterial communities in the sediment. The first data show that in the deep sea sediments of the tropical Pacific below 4000 m much fewer bacteria strive as compared to other sea floors. Further analyses after this cruise will show which bacteria are present.

All station work is supported excellently and in a very cooperative way by captain Lutz Mallon and his crew. One or another technical problem in the laboratories and with instruments was fixed rapidly so that all our instruments and equipment and the infrastructure on board were always ready to use and hopefully will continue to be.

For preparing and planning the station work and to learn more about the various projects which are being conducted by the different groups on board meetings and short presentations take place in the evening in the very suitable conference room. These meetings may even lead to new cooperations at which the groups did not even think of when preparing the cruise and which may lead to interesting additions of the research program.

According to the plan we will have one more station at 5°S before we come to the equator at 0°S or N on May 12^{th} at 180°E or W and will have a 24 hour time series station.

With best regards from the remote tropical Pacific on behalf of the scientific party and crew on board,

Meinhard Simon



Sonne steaming in the central Pacific



The CTD coming out of the water



The CTD being prepared for the next cast



The MUC coming out of the water



The MUC full of sediment