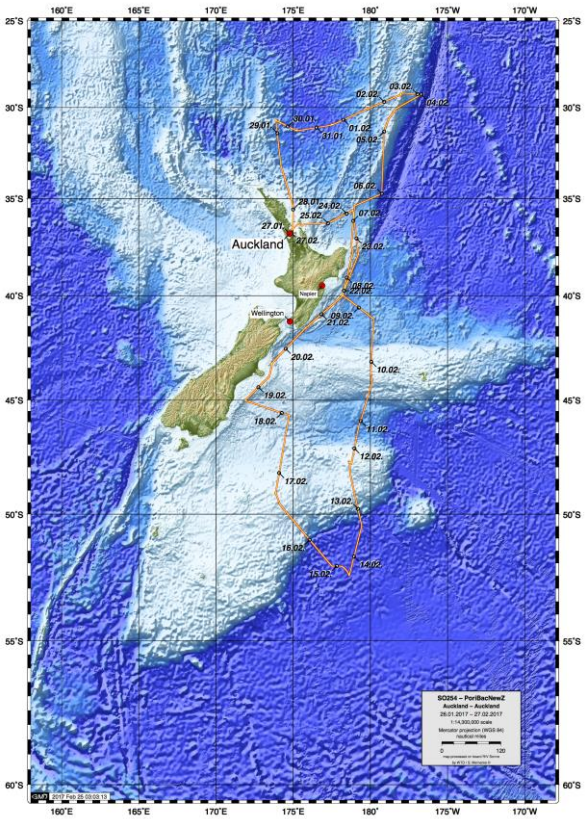
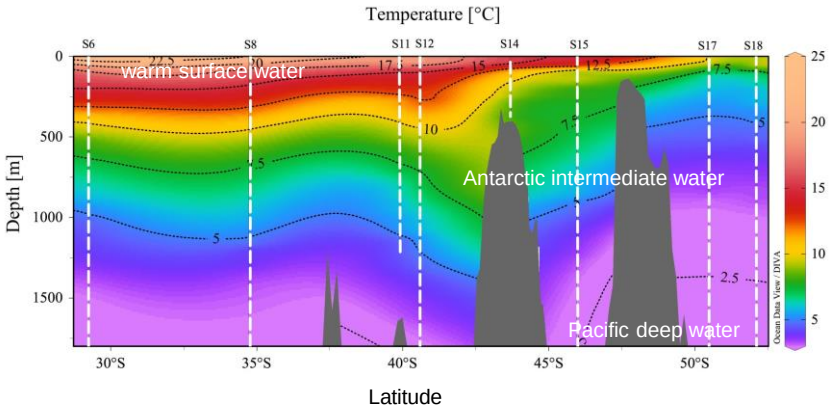
5th weekly report (20.02.17 – 27.02.17

SO-254 „PoriBacNewZ“ 26.01.2017 (Auckland, Neuseeland) – 27.02.2017 (Auckland, Neuseeland)

Meanwhile we finished our research activities and are already in sight of the coast near Auckland where we will take the pilot on board in the morning of February 27th at 7:30 am local time to navigate into its harbor. Behind us are 31 days of very work intensive research activities. Due to the time shortened by 55 hours and the unfavorable weather conditions south of 52°S we could not reach all aims we had planned for. Nevertheless we are very happy with what we achieved and consider the research cruise as very successful. For the work in the area between 29° 16‘ - 52° 7‘ S and 174° E - 176° W we steamed a total distance of 4234 nautical miles. At 25 stations we carried out investigations, at 18 of them of the communities at the sea floor by ROV operation, at 8 of them of the microbes and the dissolved organic and inorganic substances in the water column by means of CTD and at 6 of them of the sediment by MUC. At 11 stations the in situ pump was deployed to collect samples for the analysis of population genomics of organisms of the *Roseobacter* group.



The last weekly report already presented first analyses of the water masses and the location of the subtropical and subantarctic fronts and of parameters assessing biomass production and abundance of bacteria in the water column. Here I can add that the results of the latter parameters nicely complement the respective data of cruise SO248 where we also found an increase of bacterial numbers towards the north Pacific and the Bering Sea and a decrease of biomass production. The detailed analyses of the water masses using the ship-based salinity and temperature sensors confirmed the position of the fronts. The analysis of the water masses from the CTD profiles showed that, as expected, below the warm surface waters north of 43° S between 700 and 1500 m the Antarctic intermediate water was located, being subducted into these depths at and south of the subantarctic front. Below 1500 m the Pacific deep water persisted. The deep chlorophyll maximum was located at 100 m depth north of 35° S, at around 50 m with a rising trend between 35° and 45° S and at 50°S a pronounced phytoplankton bloom was present with highest chlorophyll concentrations at 30 m depth. At the southernmost station at 52° S the bloom was not present, instead at 40-80 m depth markedly higher chlorophyll concentrations, presumably the remains of a sinking phytoplankton bloom.



Based on these interesting hydrographic data we are excited about the upcoming analyses of the bacterial communities in the water column and sediment, of the geometaboome and trace elements.

What kind of comprehensive picture will arise for the distribution of these data collected between 52° and 30°S and together with the respective data of cruise SO248 north to 59°N in the entire Pacific?

During the last week we headed to 6 more stations for ROV investigations, due to better wind and wave conditions close to the coast of New Zealand at the continental slope and at the southern edge of the Kermadec ridge between 45° and 30° S. These dives brought us again a very rich array of specimen of sponges, soft and hard corals and other inhabitants of the sea floor

such as sea cucumbers, crinoids and ascidians. In total at all ROV dives together 464 animals were collected, among them 211 sponges; further primarily hart corals were collected, but also sea urchins, sea cucumbers, brittlestars and a few ascidians. A the 15 stations north of 45°S the richness was much larger than at the 4 southern stations, which stretched to 49°S. Demospongiae dominated at the southern stations whereas the Hexactinellida clearly dominated at the northern stations. From most animals samples were collected to analyse the phylogenetic taxonomy (barcoding), the symbiotic bacterial communities (of the holobiont) and for isolating bacteria and fungi, of which hopefully at least a few produce interesting bioactive natural products.

This report was written on the afternoon of the last day of the cruise prior to enter the port of Auckland. On behalf of all scientists I would like to thank very much all members of the crew of the ship and the ROV team for their in every respect outstanding support of our work available at any time. This is true particularly for the captain, Lutz Mallon, who, with his quiet and easy-going manner, directs the vessel most competently through all stormy and otherwise difficult conditions.

With best regards and a farewell on behalf of the scientists,

Meinhard Simon