

3rd Weekly Report on the Cruise Leg SO308/2 from Fremantle, Australia, to Wellington, New Zealand, covering the period from 6th of January 2025 to 12th of January 2025

Current Position: 40°17.9'S 172°20.8'E close to Wellington, New Zealand

Last Sunday, we completed our 24 hours station at 1200 m water depth over the continental rise off south-east Australia. During the station we deployed our sampling gears, including the CTD sonde with the rosette water sampler and several plankton nets with different mesh sizes repetitively every six hours so that we accomplished four sampling cycles within one day at the same position including two at daytime and two during the night.

We took this effort to study the diel vertical migration of zooplankton and many other marine creatures of the mesopelagic realm. The mesopelagic realm between ca. 200 and 2000 m water depth is the twilight zone of the ocean. The intensity of sunlight penetrating into the ocean to this depth is not strong enough for photosynthesis and, hence, growth of phytoplankton algae. However, the amount of light from the sea surface still allows animals, in particular those with big and specifically adapted eyes, to use the light for vision. For nutrition, animals in the mesopelagic realm are either dependent on organic matter, living or dead, sinking down from the sunlit surface layer or they must move up into the surface layer for feeding, where there is plenty of food available. Most diel vertical migrants come to the sea surface during the darkness of night in order to avoid the risk of being eaten themselves by fish. They spend daytime at several hundred metres depth, where lower water temperature leads to a reduced metabolism and, hence, contribute to an energy-saving life style. This diel vertical migration of zooplankton organisms is the largest, but mostly hidden animal migration on our planet.

After passing Bass Strait between Australia and Tasmania and a very shallow station on the shelf, we sampled the final stations of our research cruise in the Tasman Sea between Australia and New Zealand. At the last station, which we reached on Friday morning, 10th of January, there were many salps and siphonophores (colonial jellyfish) in the surface waters. Some of them produce their own light in a process called bioluminescence. From the working deck, we could see plankton organisms all around the ship starting to glow, once they were stimulated by the vessel's bow wave or wake.

On Saturday, we started packing our expedition equipment, loading the freight container and cleaning the labs on board.

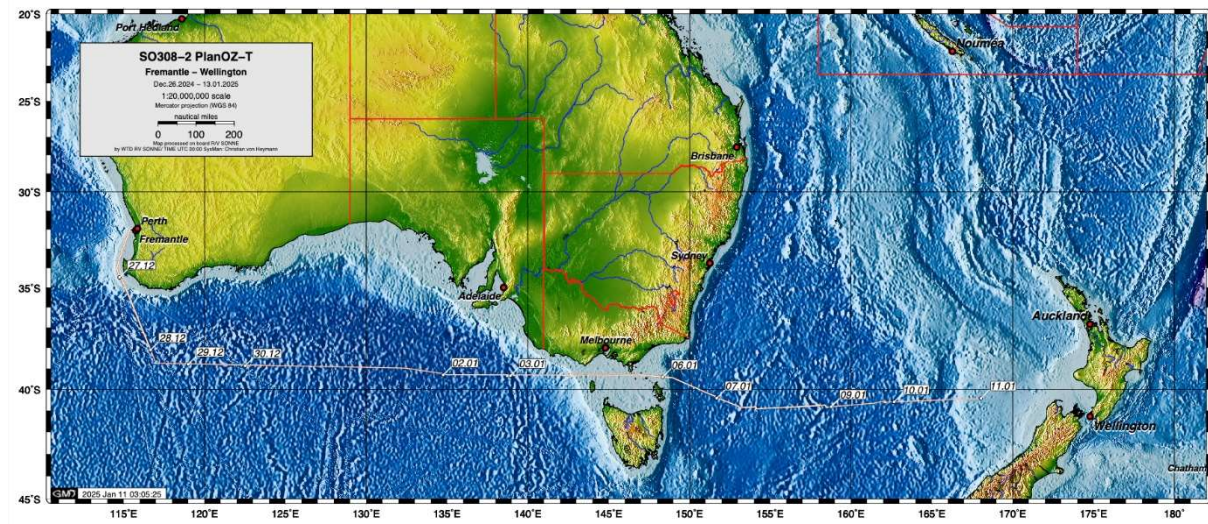


Fig. 1: Cruise Track of SO308/2.



Fig. 2: Pilot whales spyhopping and watching the vessel. Photo: K. Heinatz





Fig. 3: Albatross. Photo: C. Sickert



Fig. 4: Common Dolphin. Photo: K. Heinatz

Today (Sunday) afternoon, the students will present the outcome of their project work. Tomorrow morning we will reach Wellington, and cruise leg SO308/2 will be successfully completed. We are very satisfied with the scientific results and samples obtained during this research and training cruise. I would like to thank Captain Meyer and the entire crew of R/V SONNE again for the friendly atmosphere on board and their very skillful support of our scientific programme. We are very grateful to DFG and GPF for the approval of our cruise proposal, BMBF and PTJ for the funding and the German Research Fleet Coordination Centre for the organisational support.

Best regards on behalf of all cruise participants,

Holger Auel

Chief Scientist SO308/2