

Weekly report no. 8 ANT XXI/2 RV "Polarstern" 05.01. - 11.01.2004

Just now we have finished the sampling at Spiess Seamount, 120 miles west of Bouvet Island. Well, the volcanic slag on the uneven flanks of the seamount did rip the net of the Agassiz trawl and cost one of Martin's dredges but we caught some specimens of the red stone crabs, which we expected to be here. These crabs are of interest for zoogeographers because they seem to be recolonising Antarctica from where they were driven away by the cooling processes in the Tertiary. Bouvet Island and its surrounding shallow banks might have a special importance for the recolonisation process because of their isolated position in the South Atlantic deep sea.

In view of the grey, today quite moving desert of water around our vessel the days in the pack ice seem to have been months ago. And yet just a week ago we were in the middle of the ice fields between the Drescher Inlet and the iceberg resting place Austasen. After an unusually convenient ice situation at the start of the cruise "Polarstern" had increasingly to cope with thick floes and high snow cover, which hindered our progress. The prevailing wind from the northeast produced a considerable pressure; the tides changed the ice-covered areas hourly. If the helicopters discovered free water above a trap just some hours later at our arrival the area had complete ice cover again. At the end we were happy that with lots of luck we were able to recover the two moorings, which will deliver the environmental data for our studies. We had to leave only two traps behind that were lying under ice cover since the start of the expedition. They share this fate with the hard substrates deployed in 1998 for recolonisation; at no moment could we think of collecting or inspecting them by underwater video.

Our seal biologists have settled in on board again and Jochen reported their work. Three hydrophones under the ice of the Drescher Inlet continuously registered 15 different underwater sounds of Weddell seals. In the hours after midnight the animals like to sing most. These bioacoustic measurements should have been done also on whales, which did not appear, and shall be used to produce an automated accounting of marine mammals. Several seals were provided with mini digital cameras and further measuring instruments, which were taken off after a few days and downloaded on computers. First looks through the photographic material show high abundances of krill and particles in the cline between 50 and 150 m water depth. In this depth the pelagic fishery on board of "Polarstern" had discovered concentrations of fish at night and an increased feeding activity by the seals had been observed. For the first time our biologists observed that some seals orientated themselves along the shelf ice edge on night dives and searched for food at about 150 m water depth on the underside of the shelf ice. During the day they preferred to fish close to the sea floor at 450 m depth, exactly where "Polarstern" had discovered concentrations of fish at daytime. It was surprising that the daily vertical migration of the fish, which comprise the seal food, also went on under midnight sun conditions.

The return to the still ice-free lagoon at Austasen enabled the group studying the water column to follow the spring awakening of the plankton for more than three weeks. The mixing of the water column after the Christmas storms was displaced in early January by a shallow layering, which again created favourable conditions for a phytoplankton bloom. Amazing was the high percentage of material being produced in the surface layer that sank to the bottom of the shelf. Sediment and sediment trap analyses will give further information on its content and food quality. A last ROV deployment between the icebergs showed us recolonisation stages of different ages. Most impressive was a really new scar in which a large area of the seafloor was levelled plate-like and free of organisms. This recently formed plain might become our second reference area for the recolonisation study.

Unfortunately we were not able to stay for longer in our lagoon because time was slowly running out. Before the return north the igloos, skidoos and further gear had to be brought back to Neumayer Station and mail had to be collected from there. After a survey by helicopter and reply from the station we stopped the idea to steam with "Polarstern" again to the shelf ice edge of Atka because the whole bay and the way towards it were covered by thick pack ice. Instead we fought to come close to the station at a distance of 15 miles by air, loaded the gear onto an ice float and transported it from there as outside cargo by helicopter. Luckily both sight and wind enabled this; otherwise we would have lost lots of time.

During the night from Wednesday to Thursday we passed the edge of the pack ice at 69°40'S after difficult steaming across the ice. Into our relief to be able to plan our return journey in more detail a drop of sadness was mixed looking at the grey, unbelievably calm water. It is a struggle to move through ice and it impairs work, but this zone without any doubt is one of the most variable and beautiful landscapes on earth. We feel very lucky to be able to work here.

The next days we steamed through calm seas northwards. That meant the scientists to conclude results and to pack, the crew to clear up and stow, and both to write reports. Changes came via two things; on one hand by icebergs. Some were single bergs, more or less washed out in the most amazing forms, some with deep-blue swimming pools between the peaks, or a broad belt of icebergs at 58°50'S, whose existence might depend on an eddy of the circumpolar current. On the other hand we got excited by the obvious increase in minke and humpback whales for which we had looked out in vain in the pack ice lagoons, and the amazing richness of sea birds. Obviously the whales do not like the pack ice areas yet, heavily influenced by wind and tides, and they prefer to stay near the pack ice edge. The seabirds, mostly flying types such as petrels, albatrosses and seagulls, but also many chinstrap penguins, seem to be associated with the icebergs. Martin Fröb counted 14 species of birds alone in the iceberg belt, sometimes more than a thousand individuals. Especially for the unbaptised ones the Polar

Baptism on Saturday was a change and as always the communal barbecue united the baptizers, the baptised and the uninvolved.

Now I am back on the Spiess Seamount, which comes up from a depth of about 2000m until about 300m below the sea surface. On its top the ecosounder showed clear targets of fish or squid shoals. There has to be a lot of food around here, as shown by the many chinstrap penguins, which we can watch porpoising, and by the huge abundance of seabirds. As for those stone crabs mentioned at the start: Sven keeps an egg carrying female in the aquarium and hopes to study the developmental stages of the larvae, something nobody managed to do before.

Tonight we continue with the presentations of results and afterwards Ekke--hard is giving a lecture on the Table Mountains of Venezuela. We will – as always on these cruises – be busy over the top of our ears until our arrival in Cape Town.

Everybody sends her/his best wishes to the ones staying at home, including me, Wolf Arntz