

Weekly report no. 5 (ANT XXI/2) RV "Polarstern" 15.12. - 21.12.2003

Today, on the 4th pre-Christmas Sunday, we are ruled by the packice. During the night we came 10 miles close to the site where hard substrates for settlement were deployed 6 years ago. Still half sleeping we realised that the ice had gotten thicker; more and more often the bow hit thick, multiple-layered and snow-covered ice floats, the stuttering of the engine and the leaning got more common. At some time everything stopped, and for some hours the bridge had to run back and forward trying to free the ship. Because of this we gave up the idea of inspection and pick up of the hard substrates and steamed back to Austasen where we hope to find open water.

Most of this week we have spent on the BENDEX experimental site, to simulate and document the effects of an iceberg scar. As mentioned in last week's report, the closed net brought unworkable loads of sponge spicule mats on deck. Therefore, Rainer had the cod end cut and ran the gear open-ended. After some hauls the net remainder was lifted onto the deck to enable the specialists to pick the numerous organisms caught in the meshes. The haul site was completely trawled after 12 hauls and we waited eagerly for the first pictures from the UW-video.

They looked promising! The fear of some colleagues, that the dredged fauna would evenly cover the experimental site because of the cut off cod end, was without reason. The net had left a broad drag track on which more or less no large organisms remained. The trawl doors had left deep trenches, the bomber-rollers shallower ones, and the bottom rope and chains, shallow grooves. Fish were quite common on the free-trawled area, obviously engaged in feeding on the remainders of damaged fauna. Every now and then a strip had been left, on which large sponges were lying on their sides, half covered with mud, and at other places large, sediment-covered "compost heaps" proved that the net had got rid of its load. In total we have achieved our goal to produce a large, open area for a re-colonisation event with a known starting point.

It is important to record this event not only with visual methods but also with quantitative sampling in the cleared area. Therefore the multi-boxcorer and giant boxcorer got into action again, to confirm the impressions gained from the photos. With this the experiment was finished and we were able to say farewell to our wide, grey lagoon whose contours are familiar to us by now; to its south, the impressive structure of the shelf-ice edge, and in front of that some flat fast ice remaining due to the low wind speeds. On either side, the edges of the sea ice areas, constantly changing by tides and winds. We greet some of the icebergs, which enlighten the scenery, as old friends. Our trawls always end in front of a large iceberg with a cave full of ice pinnacles in the middle. Nearby on the neighbouring sea ice stands our welcome committee consisting of 9 Adelie penguins that follow our actions with great interest and loudly chat to each other. Otherwise marine mammals are rare at the start of this summer. We have never seen whales in our lagoon; only from the helicopter, on its shelf ice

edge survey, a group of five animals has been seen some kilometres away. Our colleagues in the Drescher Inlet reported by telephone that they had not seen whales either; the ecological and acoustic studies on Weddell seals are going well, and the video camera of our Japanese Yuuki works well on the back of a seal. The break-up of the mouth of the Drescher Inlet has not progressed in the expected way due to the low wind situation.

On Friday we decided on the strength of the ice condition to repeat the "Gili-transect" from the 6th/7th December. Apparently we hit the right time; the mixed layer of water is now defined down to 50 m, much shallower than 13 days ago when it was found between 75 and 100 m. This body of water is separated from deeper layers by a pycnocline. The salinity decreased by 2/10 which was caused by the start of the melting of sea ice, introduced by the sunny days, while the sea surface temperature did not change. The temperature at 500 m depth dropped from -0.25 to -1.5°C in this period. In the upper 50m the biomass of algae nearly multiplied by a factor of seven in the same length of time, and a huge transport towards the seafloor occurred. The giant water box is collecting large amounts of chain-forming diatoms from the surface layer at seafloor depths between 300 and 400 m.

The planktologists have finished a 10-day long continuous station. Anna and Jan have also reported the large increase of algae in the surface layer, but dominance changed from chain-forming diatoms to Phaeocystis which began blocking their filters. In herbivorous copepods the nauplii have been replaced by early copepodite stages. Juvenile stages can now be found in carnivorous copepods, too, while cyclopoid copepods are still rare.

Saturday has been unusually silent on board because many colleagues, who had worked on the Gili-transect for 24 hours, have had to catch up on sleep. Some of them missed a fantastic natural play, when "Polarstern" steamed by an unreal flat sea through a group of icebergs, which were mirrored in each little detail.

A pick-up of the fish and amphipod traps from the first station near Atka was senseless; the entire area was covered with dense pack ice. A heli-----copter came back with the news that the traps and Marc's lander near the BENDEX site were free of ice. The lander had caught only a few invertebrate larvae although the plankton bloom is on. If there would be plenty of them here, they need to show up soon! The physiologists' fish trap had caught just one fish again; don't they have the need down here to react to baits? Even the necrophagous amphipods and isopods, normally a sure hit, were less numerous and diverse.

Remembering the interesting catch of stalked crinoids last week we went back to the 1500 m station and deployed the multi-boxcorer with the video system. The approx. 30 cm tall animals always seem to sit on small stones, with a density of 2-3 per square metre, and filter particles out of the current with their arms. Unfortunately a shortout underwater finished the show before we were able to find large stones on which we had expected real

lawns of these organisms.

After the failed trip to the hard substrates, next work will concentrate around the iceberg-resting place Austasen near to the BENDEX site to compare natural iceberg scars with undisturbed areas. How long this will go right, nobody knows. For the next week the meteorologists have forecasted strong winds which could mix up the set ice conditions, but unfortunately winds from the wrong direction. Because both of them are already polar baptised we lack any medium of pressure to prompt them to more positive forecasts. So we can only hope that the ice-free lagoons in the shade of the icebergs will hold on so that we can work.

Twenty-four hour days and midnight sun inhibits the Christmas mood, although the messes stay Christmas-like decorated, bowls full of gingerbread, nuts and marzipan rolls are always reloaded by Moni's crew. We baked Christmas cookies like at Mum's, and some try Christmas chorals or, as an alternative, a modern Christmas play. Only a shiny, Christmas-like decorated forest is missing in this desert of ice, but on the other hand, a WHITE CHRISTMAS is guaranteed.

We all wish you at home a merry, stressless, and harmonic celebration!

Yours, Wolf Arntz