

Again we have reached the southern most point. Low winds, open leads with no or thin ice cover and few ridges favoured our trip south to the starting position of transect 3. Last Monday, 24 July 7:52 pm, we finished transect 2. On the last station of this transect we again deployed the working horse instruments of this cruise: CTD, RMT, MN and SUIT. By now we all know that CTD stands for conductivity-temperature-depth probe, RMT stands for rectangular midwater trawl, MN is the multinet for zooplankton and SUIT is the surface under-ice trawl.

This time the RMT was lowered three times, to 200 and 50 m and additionally to 3000 m water depth to catch organisms of the mesopelagic zone. After 6 hrs trawling in a 15 nautical mile long lead between ice flows, the net surfaced full of strange creatures. Shiny red deep-sea shrimps, finger long chaetognaths with sky blue intestines, bright red amphipods, centimetre long copepods carrying loads of eggs, purple-red medusa, more than 800 summer-surface-dwelling krill (*Thysanoessa* not *E. surperba*) and more than 140 fish of at least 5 species. Many people were pleased with this catch. Several experiments were started in the cool container that will determine the metabolic activity and the feeding response of the mesopelagic zooplankton, data that were not available so far from this area for winter time.

The Dutch group on board has constructed a net system to catch the under ice biota quantitatively. The last weekly report mentions that our divers saw krill hiding against predators underneath the sea ice. Sea ice also provides a suitable feeding ground. Video sequences and photographs document high concentrations of krill between piled ice floes. The SUIT net can be trawled under the sea ice with a speed high enough to catch the fast swimming krill. The net really has to be robust to resist. The 4 square metre wide and 4 m long frame is made of 9 cm wide steel tubes. On the upper front bar, 9 car wheel tires help the net to slide and roll under the ice. A sprout is attached to one side of the frame that also serves as otter doors. Thus, once towed with 1.5 knots speed, the net slides aside under the undisturbed sea ice as it leaves the wake produced by Polarstern steaming through the ice. The top is open to allow big pieces of ice to leave the frame again, as they are pushed upwards by steel bars with a width of a man's arm. The fine mesh sized 14 m long net itself is attached to the lower end of the frame and is protected on the outside by a course strong additional fishing net. Crew and scientists are working as a team and lower this prototype sampling gear into the water where it slides under the ice in a distance of 120m beside the ship. To assure that ice flows do not entangle with the towing cable, an additional lead weight of 900kg pushes the 18mm wire straight down deep enough to slide freely under the up to 2m thick ice floes.

The largest catch of the cruise by the SUIT so far resulted in 250 grammes

fresh weight in a 25-minute trawl and comprised of over 900 krill adults and sub-adults. Some siphonophores and pteropods were also caught from the 2 m uppermost ice-covered layers of the ocean. The difference of the temperature between water (-1.85°C) and cold air (-27°C) creates sea smoke, a vision of steaming water between ice floes in the wake of Polarstern. The half moon slowly emerges from the dark boiling sea into the starry night and creates a profound panorama for the 8 people working hard and hand in hand to operate the net that's nickname has become „chariot“.

After such a successful trawling all people were busy in working up the samples while Polarstern headed south again. As reported we had decided to start the last transect from the southernmost point and then go north, station-by-station. With the incredible average speed of 5.3 knots it only took us 4 days and 4 hours to travel the distance of 519 nautical miles between the last northern station on transect 2 to the first southernmost station on transect 3. Imagine, breaking through 30 to 40 cm thick ice with an average speed of about 10 km per hour – our 24-year-old ship is still full of energy. The captain and the navigation officers cleverly find the way zigzagging through thinner ice fields and avoiding thick flows and compiled ridges.

On the speedway south we passed hundreds of mighty icebergs. Most of them are standing out with 60 m and more above the rather flat planes of snow-covered sea-ice. Some look like the castles in southern Germany, others resemble luxury liners in shape when they pass Polarstern. Cracks and crevices allow a quick look into the light-blue interior of these giants. At night the headlights of the ship illuminate the frozen cathedrals for a silent moment of wonder.

In the meantime a severe low-pressure system has evolved further to the west and has decided to roll slowly into our investigation area in the southern Lazarev Sea. Forecasts predict a minimum of 945 hPa, a value that seldom occurs in the northern hemisphere, inducing strong storms of Beaufort 10 and more. Luckily the ice does not allow waves to evolve, but wind directions from the north and east will compress the sea-ice against the continent. This storm is expected by Monday night and we are eagerly working our program to escape the mousetrap before it closes. By Sunday we expect to be safely 240 miles off the coast.

So, another busy weekend is awaiting us with round-the-clock work on deck and in the labs. We hope most of you enjoy the summer holidays.

Uli Bathmann