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On July 1st at 14:56 UTC the stabilized electric power supply for the computers collapsed without warning. Computer screens turned pitch-dark everywhere, most electric sensors stopped recording and no digital control was available. Five electricians and electronic engineers hurried into the computer rooms and vanished a little later in the catacombs deep down in the ships interior. Soon the problem was identified, but it took several hours to bring all computers back to life. A steam pipe had burst just near the transformer box of the safest electrical network on board. On its weakest point, a mixture of hot water and boiling air steamed the back-up batteries that should secure stabilised and continuous power supply even in the worst case scenario of power failure. We lost some records of on-line data, some hard discs did not wake up any more, but fortunately most data were saved and could be restored from the several back-up systems installed on our ship. For three hours research activities were interrupted but continued immediately when a second power system had provided vitality for the essential control units on the bridge and in the labs.

Presently we are finishing our first N-S transect going south station by station. At each position the sampling has developed a routine sequence of instruments. First we fish for our target species Antarctic krill (Euphausia superba). The term “Krill” originated from the Norwegian language and means „what the whale eats“. That can be a large variety of organisms including zooplankton, euphausiids and other swimming crustaceans. Six euphausiid species live in Antarctic waters whereby five of these species are found in the Lazarev Sea. We use the term krill explicit for the largest euphausiid (E. superba) that also dominates the others in biomass and abundance.

Several geographical locations of high krill abundance are known around Antarctica since the early observations from the 1930´s. The last 40 years of international research were concentrated on areas located north of the Antarctic Peninsula (Scotia Sea), around South Georgia, Elephant Island, and South Shetland Islands and in the Bellingshausen Sea. Krill is commercially harvested in these areas for 30 years especially with fleets originating from Ukraine (former USSR), Japan and during the last years with increasing effort also from Korea, Poland, Chile, Argentina and the USA. Total catch in 2002 was around 120 000 tonnes, far below the limit of 4 Mill tonnes determined by an international body in charge of fishing activities in the Antarctic, called The Convention for Conservation of Antarctic Marine Living Resources - CCAMLR. Krill is used for human consumption, as food in aquaculture, for aquarium fishes and as bait in sports fishing. In the future we expect krill to be used for high quality products as Chitin-Chitosane, pharmaceutical oils, special fat products (omega-3-fatty acids), the red coloured Astaxanhin and other chemical, pharmaceutical, medical and cosmetically products. Krill catches were much higher than today when between 1978 and 1993 the Soviet fleet alone caught

300 to 400 thousand tonnes of krill annually.

Other areas of dense krill occurrence are located in the Pacific sector of the Southern Ocean north of the Ross Sea, north of Prydz Bay in the Indian sector and in the Lazarev Sea, eastern Weddell Sea, where we are now. We assume that species drift between the populations of these areas and that krill is distributed circumpolar. As this has to be proven, we store sam---ples for molecular genetic tests in minus 80°C freezers on board ship.

Krill has a central role in pelagic Antarctic ecosystems as it serves as food organism for many vertebrates including whales, seals, penguins, flying birds and fish. Also the food spectrum of krill is highly diverse reaching from minute plankton organisms to the biota living under and in the sea ice. Krill can live for 7 years and can reach from 50 to a maximum of 63 mm in body length, whereby it only grows during the few summer months, which are rich in food. Krill matures in its 3rd year; it can reproduce for up to 4 years allowing the stock to sustain several un----- favourable years. Investigations from the Antarctic Peninsula indicate years of high sea ice concentration also being years of high krill pro--- duc--tion and vice versa.

To catch krill, we deploy the 8 m2 big RMT (rectangular mid-water trawl) from the ships stern and fish for about 40 minutes with a ships speed of 2 knots oblique down to 200m. After retrieval, the catch is preserved, ex--- am--ined under the stereomicroscope; specimens are identified to species and developmental stage, sex and stage of maturity and counted. From the database obtained, population dynamic parameters will be derived including age structure of the population, hatching success and the regional dis--- tri--bution of krill. With additional data from other expeditions we will be able to predict krill production for our investigation area.

Operation of such a big net in temperatures below minus 23°C is no fun. Crew and scientists are standing on the icy slippery aft deck handling the frozen lines, which should better not be touched with bare hands. Espe---- cial-ly when the net is retrieved, it freezes solid immediately in the cold air. So getting the cod ends with the samples and bringing them back into the lab is important to obtain intact and often lively animals. Most of the catches brought very little animals, but on Friday morning at 69°S about 5000 krill were happily swimming in buckets, beakers and glass dished. Excited scientists with a big smile on their faces eagerly sorted and counted species, transferred some into the cool lab containers for ex-- per-i--ments, and stored others for analysis. This was the first really big catch during the cruise. We assume that the net fished a krill swarm that was surfacing under the thin ice through which Polarstern progressed its way in the dark morning hours.

Thursday 6th, was a glorious day although the sun just glanced over the horizon for short 55 minutes. Spectacular photographs were taken, most of

them digital and distributed on the intranet of the ship. It is much to expensive to send them home via e-mail, but I am sure that most of you will see some, once your colleagues, friends, and relatives will be back home. On Friday morning the captain performed a “man-over-board” manoeuvre where-by our female diver went into the water and smilingly floated between the tiny ice flows beside the ship. She was “rescued” in reasonable 12 minutes, a time span very long to spend in minus 1.8°C cold water without an insulating diving suit.

As we finish the first N-S transect, we plan the second which path very much depends on the sea-ice conditions awaiting us. We are quite busy performing our experiments and processing the samples and the data. Time flies. For all those who are interested in where Polarstern is at the moment, please refer to the Internet link:
http://www.awi.de/MET/Polarstern/psobse.html

Take care at home, as we do on board, and best wishes

Uli Bathmann
10 July 2006