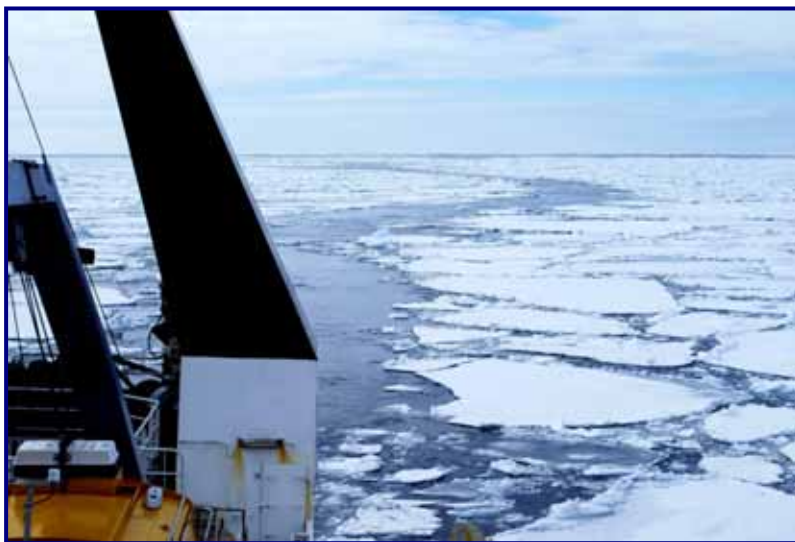


## NZ IPY-CAML Voyage 2008

### 7-10 FEB Through the sea ice barrier & starting sampling

After 1560nm and six days, the vessel reached the sea ice barrier blocking the entrance to the Ross Sea. Normally at this time of year the route into the Ross Sea is relatively easy with only a short passage through thin ribbons of sea ice. This year can be classed as one of the heaviest ice years in the last 30. The route to open water in the south took us through approximately 250nm of closely packed ribbons of first year ice, initially with wide open 'leads' (gaps) between but as we progressed south towards the Ross Sea these leads thinned till the ice was very densely packed along the southern edge.

Also noticeably absent were the numerous icebergs seen in previous years. The pack ice might be very extensive but the first iceberg wasn't seen until 64°10.7'S 179°11.5'E – a lot further south than previous years. Since then very few large bergs have been sighted.



*R.V. Tangaroa* progressing through the sea ice (Photos: John Mitchell)

Once in open water *Tangaroa* steamed south to the first station, a 'demersal' one at approximately 73°S in around 300m of water. Time for all the science team to move onto their 12 hour watches and test out the sampling and sorting methods.

We have three main sample station types. Demersal stations are where we obtain extra samples of fish, squid, and large invertebrates that live near the seafloor. The sampling procedure is: multibeam (echosounder) survey of the seabed to assess its suitability for gear deployment; Deep Towed Imaging System (video and still cameras - DTIS) to survey invertebrates and fish *in situ* on the seabed; and rough bottom trawl to catch fish that live on the sea floor.

Mesopelagic stations are where we obtain extra data from the water column. This is where the mesopelagic trawl (a fine-mesh midwater trawl) will be deployed on unidentified marks recorded acoustically. This process helps to identify what's there – whether it be small fish, zooplankton etc.

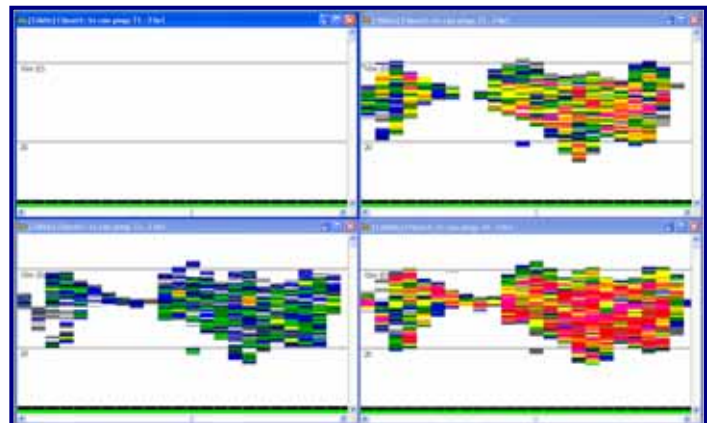
The main sampling effort will go into the core sampling stations which form the core of the IPY-CAML survey. At core stations, the entire water column from the surface to the seabed, and the seabed itself will be sampled using all the different pieces of equipment available. Core stations are distributed at key locations across the Ross Ice Shelf, the continental slope, and the abyss. The gear types include: CTD (measures Conductivity, Temperature, Density) and also collects water samples; DTIS; mesopelagic trawl; multicorer which collects sediment samples; rough bottom trawl; beam trawl for collecting organisms from the sea floor; neuston net for collecting zooplankton (animal plankton) samples close to the surface and the MOCNESS net which can be used to collect zooplankton from specific depths by a remotely triggered opening and closing device.

## SCIENCE REPORT

### Fisheries Acoustics

Continuing on the Fisheries Acoustics theme, acoustics data continues to be collected as we progress south into the Ross Sea. Compared to data collected in New Zealand waters the total amount of signal has been much lower south of the polar front – where the relatively cold, fresh Antarctic waters begin – almost down to background noise level, with only a few ‘marks’ (acoustic signals associated with fish, invertebrates, or large plankton) visible in the upper 100 m.

Fig. 2. Example of a shallow school seen at 70°00’S 178°30’E. Acoustic signals were strongest (mostly red and yellow) on 70 and 120 kHz (right panels), weaker (green and blue) on 38 kHz (bottom left), and were not detected on 12 kHz (top left). This frequency response is characteristic of macrozooplankton, and the school was probably krill (Richard O’Driscoll).



### Pelagic (Plankton) Group

Since leaving Wellington calibration samples for the new ‘underway optics’ system have been collected three times a day. This samples water while the ship is moving for studying the light-scattering and absorbing properties of phytoplankton. Phytoplankton are microscopic plants that form the basis of the ocean food chain. The data will be used to improve estimates of phytoplankton concentrations from satellite images of ocean colour. The Continuous Plankton Recorder (CPR) has been towed throughout the transit south to collect zooplankton samples in the surface waters. Significant changes in zooplankton populations have been seen on the silks which are used to collect the zooplankton. We have also



collected samples at 55°, 60° and 65°S as part of the International Census of Marine Microbes (ICOMM) programme which is collecting samples over a latitudinal gradient on several transects around the Antarctic. Additional samples for this programme will also be collected at 70° and 75°S weather and ice conditions permitting.



Fig. 3. Dr. Julie Hall preparing the CPR for deployment. (Photo: Glen Walker)

Fig. 4 Silk from the CPR showing zooplankton captured on the mechanically advanced silks. (Photo: Richard O'Driscoll)