

NZ IPY-CAML Voyage 2008

10 - 12 MAR Admiralty Seamount

John Mitchell

We've spent the last two days sampling the Admiralty Seamount which has a large (12 x 5 nautical miles) flat top at about 460 m deep, and very steep flanks dropping to over 3000 m. The sampling has shown the top to be rather sparse biologically, apart from a couple of small areas which have an abundant and diverse fauna. Further sampling of those areas will be done later in the week. Although we are north of the pack-ice and access to this seamount is generally good, numerous tabular bergs in various stages of disintegration surround us.

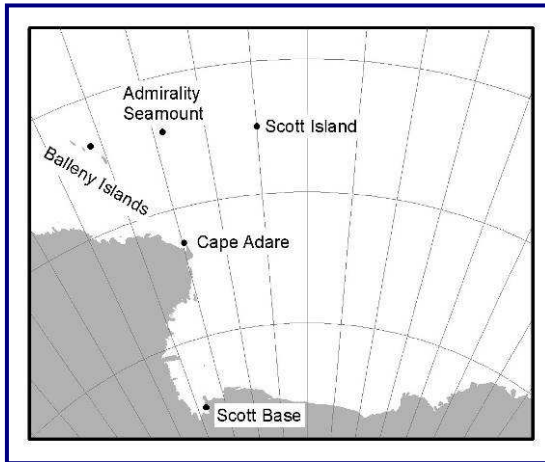


Fig. 1. Location diagram showing the position of Admiralty Seamount relative to Balleny Islands, Scott Island and the Antarctic continent (Image: Arne Pallentin).



Fig. 2. One of the many heavily eroded bergs seen in the northern Ross Sea (Photo: John Mitchell).

We've also started sampling at our last abyssal station in a water depth of 3500 m just northeast of the Admiralty seamount. The immediately obvious difference between this abyssal station and those sampled to the east, is the smaller number of glacial erratics and drop stones found here. As we explained in earlier reports, these are stones plucked by glaciers, carried out to sea on icebergs, and dropped to the seafloor when the icebergs melt.



Fig. 3. Seabed image at the abyssal station showing a muddy substrate with numerous animal tracks, burrows, a sea cucumber and absence of drop stones (Photo: DTIS).



Fig. 4. Eight tubes of mud collected by the multicorer on the abyssal station awaiting analysis (Photo: John Mitchell).

SCIENCE REPORT

New species and records from the Ross Sea

Malcolm Clark (NIWA) and Stefano Schiaparelli (Italian National Antarctic Museum)

As promised in our last report, here are some finds from the Ross Sea that we are confident are 'new':

- 1) A crinoid (or sea lily), genus *Bathyrinus* (Fig. 5): We knew of one record of this genus from the Ross Sea prior to the voyage, but have caught many specimens over a wide area in shallow water. The voyage records have greatly extended the known range of the species.
- 2) A sea urchin, genus *Pourtalesia*: Three species are known to occur in Antarctic waters, but none have been previously recorded in the Ross Sea. We haven't caught any, but have photographed them and their meandering tracks on the seafloor with the DTIS camera system (Fig. 6). They appear to feed on detritus among the sediment on the seafloor.
- 3) The gastropod snail *Miomelon turnerae* (Fig. 7): We caught one specimen of this species in a deep water beam trawl tow at 2200 m, which is a new record for the Ross Sea. It is a very large species that has only recently been described (1990), and to date has only been reported from the Magellan Strait region off South America. It is a true deepwater snail that over evolutionary time has lost its eyes.

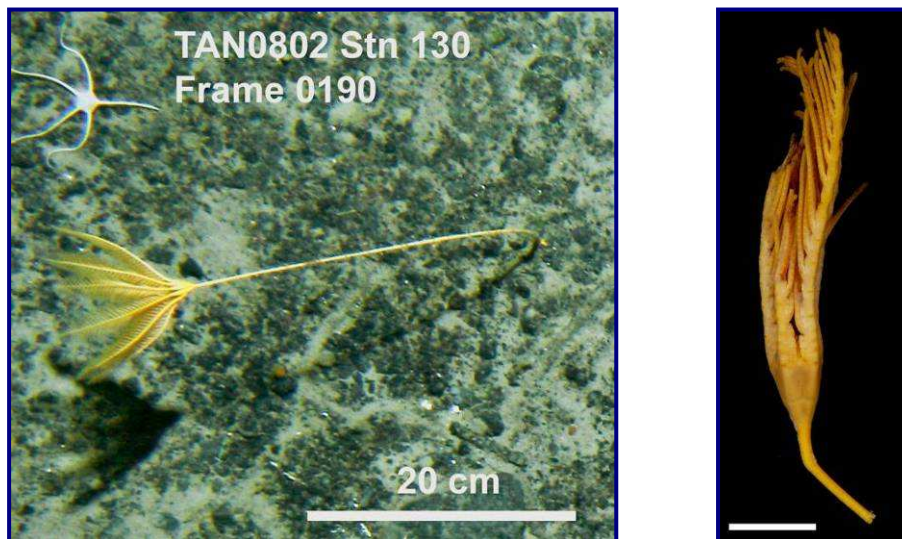


Fig. 5. The crinoid *Bathyrinus*: in situ (Photo DTIS) and specimen (Photo: S. Schiaparelli)

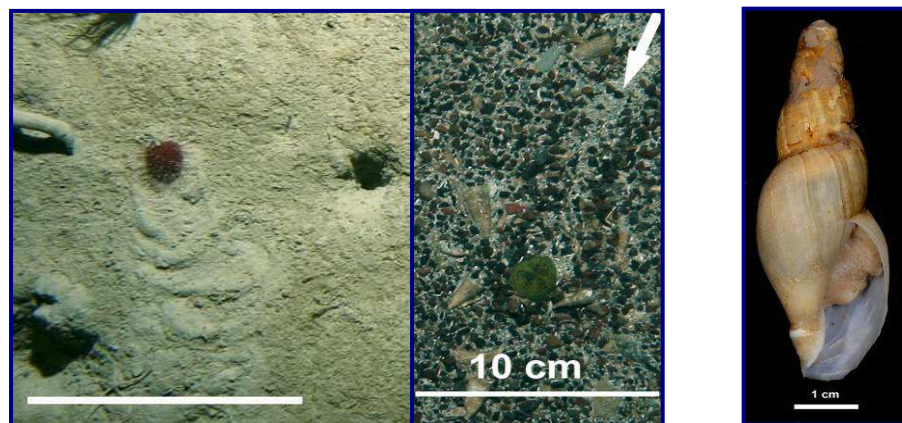


Fig. 6. *Pourtalesia* and *Abatus* (Photo: DTIS)

Fig. 7. *Miomelon turnerae*
(Photo: Stefano Schiaparelli)

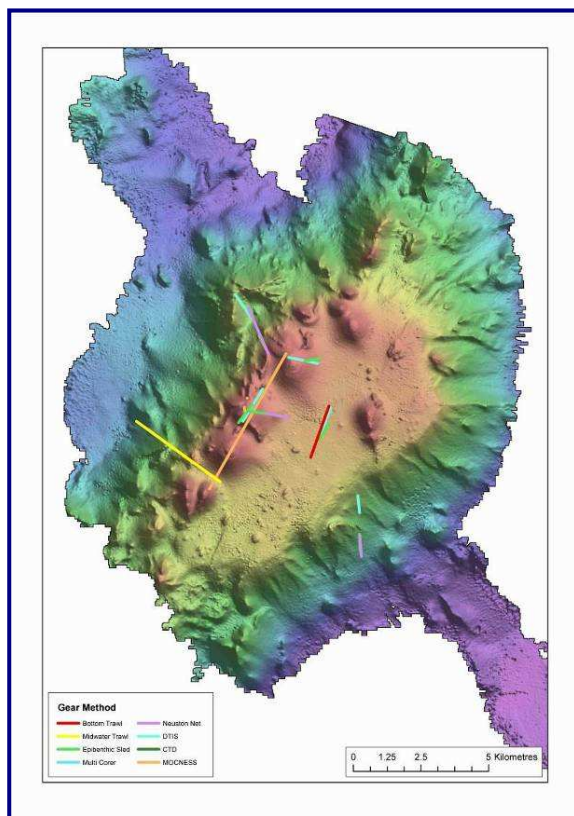
Sampling seamounts in the Southern Ocean

Malcolm Clark (NIWA)

About a week ago, we left the Ross Sea shelf and slope areas to the south, and headed north through the ice barrier to sample some seamounts and abyssal plains to conclude the survey before returning to New Zealand. The aim is to compare biodiversity in the Scott Island seamount complex with that of the Balleny Islands Seamounts and the Admiralty Seamount to the west.

Seamounts are essentially undersea mountains, arising from the deep waters of the abyssal seafloor, occasionally reaching the surface to form islands, such as Scott Island or the Ballenys. They are usually of volcanic origin, as in the case of the Scott Seamounts, which are believed to have formed about 45 million years ago, and to be a side fracture zone from the main tectonic plate boundary between the Antarctic and Pacific plates. Consequently, they can be large, rugged, and steep.

We headed first to South Scott Seamount and then north to the Scott Plateau just south of Scott Island where several seamounts are charted. We had data on summit position and depth, and had expected (more or less) a regular mountain-like structure, but as we began to survey the area with the multibeam echosounder system, South Scott proved to be a very complex system of small peaks emerging from a ridge-like plateau.



The hull-mounted multibeam echosounder system onboard *Tangaroa* is a fantastic tool to rapidly determine the bathymetry in this sort of situation, and dramatically improve survey planning in this very rough terrain where gear can be easily damaged. South Scott Seamount rises from depths of 3500 m on the eastern side, to about 600 m on the summits of several of the peaks. The main axis of the seamount lies northeast to southwest, and has seven prominent volcanic cones aligned on the western side.

This site was considered a “core” seamount site, and so we deployed a wide range of different sampling equipment over a 36 hour period (Fig. 8). We spread our sampling effort around the seamount to encompass a variety of habitats based on its topography, substrate and depth,.

Fig. 8. (left) Multibeam bathymetric (water depth) image of South Scott Seamount, with locations of equipment deployment lines shown (Image: Arne Pallentin).

Fig. 9 (below) shows some of the seafloor we photographed and sampled.



Fig. 9. Shell hash, with a rock, soft coral and crinoid ('sea lily' or 'feather star'), northwest flank, at a depth of 1250 m (Photo: DTIS).

Deep sea krill

Richard O'Driscoll and David Bowden (NIWA)

As the DTIS camera system skimmed the seafloor at a depth of 550 m close to Scott Island, we watched the live low-resolution video feed back up to the ship and saw what looked like shoals of tiny fish swimming away from the approaching camera. Once DTIS was back onboard and the still photographs and high-resolution video were downloaded, we were amazed to discover that what we thought had been fish were, in fact, Antarctic krill (*Euphausia superba*) (Fig. 10). The presence of krill at these depths was confirmed in MOCNESS samples from 300-400 m as well as krill-like acoustic signals. Conventional wisdom is that krill form schools within 150 m of the surface, so these observations of krill so deep and so close to the bottom were a surprising and very exciting find. It's uncertain whether this is related to the extremely steep seamount topography of the area, or the behaviour of the krill themselves. Not for the first time in this survey, our observations have thrown up more questions than answers!

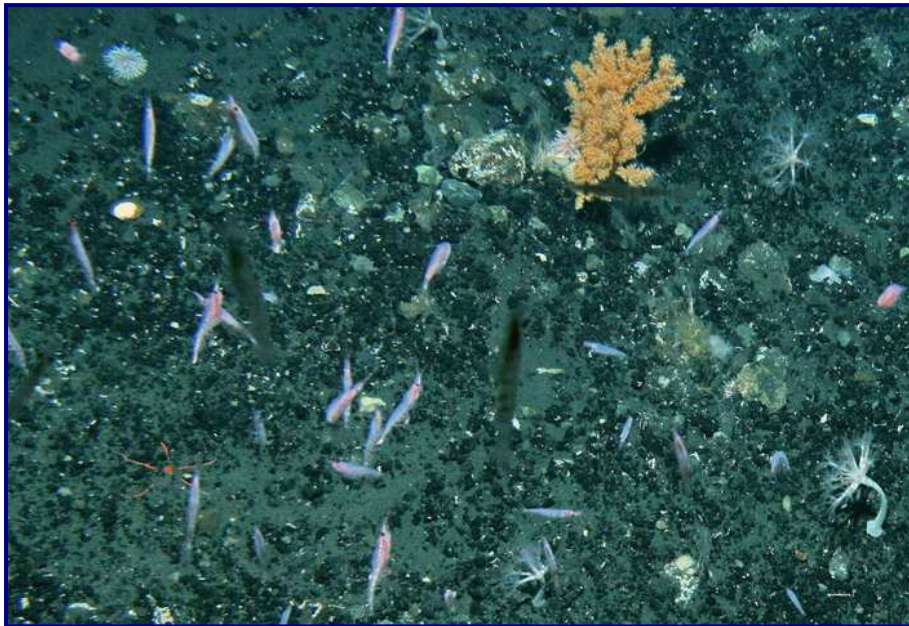


Fig. 10. Antarctic krill photographed close to the bottom at a depth of 550 m near Scott Island (Photo: David Bowden/DTIS).