



“Good science can help sustain ecosystems, tackle bio-invasions, and support aquatic industries”

Dr Don Robertson, Chief Scientist
– Aquatic Biodiversity & Biosecurity

NIWA's National Centre for Aquatic Biodiversity & Biosecurity – desired outcome

New Zealand's aquatic biodiversity is understood, conserved, and sustainably managed. There are no further human-induced extinctions, and threatened species and important habitats are protected or on their way to recovery. Biosecurity systems reduce the arrival of undesirable aquatic species and those that are here are rapidly detected and controlled such that they do not threaten aquatic biodiversity and New Zealanders' economic use and enjoyment of our waters

Exploring Antarctic biodiversity

With a ceremonial send-off by the Prime Minister, they left Wellington on 31 January, bound for the Ross Sea. An epic 50 days and some 13 000 km later, *Tangaroa* and its 44-strong complement of scientists and crew returned home. Despite the worst sea-ice conditions witnessed in 30 years, and the huge logistical challenges involved, they successfully completed the most comprehensive biodiversity survey of the region.

The voyage was part of New Zealand's flagship project for the International Polar Year and a key player in a 23-nation circum-polar survey, the Census of Antarctic Marine Life. The voyage was led by NIWA with funding from Land Information New Zealand. It involved a huge collaborative effort between government agencies and research providers in New Zealand, Australia, Italy, and the USA.

The main aim was to survey biodiversity in the Ross Sea region to provide a fuller picture of the marine ecosystem and what makes it tick. The data will also inform sustainable fisheries management and provide a baseline for monitoring the effects of climate change and human activities on the region.

The team sampled 39 sites from the Ross Sea shelf and slope, and unexplored seamounts and abyssal plains immediately to the north. They recorded everything from viruses to whales, from the sea surface to the seafloor, collecting more than 37 000 specimens using a huge variety of gear. NIWA's Deep Towed Imaging System photographed seafloor communities and habitats down to 3500 m. The bonanza of high-resolution imagery – 12 500 stills and 55 hours of video – is revealing creatures, habitats, and behaviours never seen before. These include dense meadows of giant yellow sea lilies on Admiralty Seamount, and dense schools of krill – normally found in surface



Scientists on *Tangaroa* sort some of the more than 37 000 biological specimens collected during New Zealand's International Polar Year voyage to the Ross Sea, Antarctica, in early 2008.

waters – swimming near the seafloor, 500 m below the surface. Acoustic data captured by *Tangaroa's* scientific echosounders have produced the first abundance estimates of Antarctic silverfish – a key part of the Ross Sea food web – by acoustics.

The task of analysing this wealth of data has begun and will take at least the next three years, involving experts throughout New Zealand and the world. NIWA is managing the painstaking process of categorising and identifying the thousands of invertebrate specimens collected, while Te Papa is handling the identifications of some 88 species of fish. Many will be new to science.

FUNDER:

- Land Information New Zealand (Ocean Survey 20/20 and new government funding for International Polar Year)

COLLABORATORS:

- Ministry of Fisheries
- Land Information New Zealand
- Ministry of Foreign Affairs & Trade
- Antarctica New Zealand
- Te Papa Tongarewa (National Museum of New Zealand)
- Victoria University of Wellington
- University of Waikato
- The University of Auckland
- Università di Genova (Italy)
- National Oceanic and Atmospheric Administration (USA)
- Science Learning Hub
- Cousteau Society
- Census of Antarctic Marine Life