

# Research vessels

## Future-proofing *Tangaroa*

After 15 years of being pounded by extreme weather and sea conditions, *Tangaroa* spent over four weeks undergoing essential maintenance this year. Although repairing the damaged gearbox wasn't scheduled, it provided a timeslot for other planned work.

In mid 2005, we started a 3-year electronics replacement programme, equipping the vessel with state-of-the-art technology. This included a worldwide alarm system to be activated in event of a pirate attack, satellite receivers for weather monitoring through thick cloud cover, special heated windows on the bridge to prevent icing in Antarctica, satellite communications systems, and an Ethernet system throughout the vessel allowing worldwide web access from every cabin. Seabed sounding gear was upgraded, and new electronic bridge equipment was purchased, including an 'intelligent' radar to identify other vessels, their speed and sailing direction, to help avoid potential collisions. A new crane was installed, and electrical wiring upgraded. New audiovisual systems were installed in the conference room and lounges.

Upgraded computer software now enables data recorded onboard to be accessed by any NIWA staff member, and extends the range of onboard data collected: these include wind speed and direction, air and water temperatures, salinity of the sea surface, scientific measurements, and detailed day-to-day operating data. Onboard video coverage of critical operations is also available on the computer network.

All these upgrades are designed to future-proof the vessel and ensure it continues to provide accurate, real-time data at all times.



Skipper Roger Goodison (top) and Stephen Robbins (centre).

Alan Blacklock, NIWA



Mike Nerdanovici, NIWA

## Pirates add to *Kaharoa's* legend

*Kaharoa's* Argo 6 voyage to Mauritius, which left Wellington in August 2006, proved to be just a little too eventful.

The crew is used to big seas, gale-force winds, and getting by in a variety of foreign climes, but they did not expect to be boarded by pirates inside a high security naval port. The crew was bedded down for the night in Mauritius when pirates forced the doors to several external rooms, but failed to gain entry to the ship proper. A permanent guard was promptly supplied for *Kaharoa*.

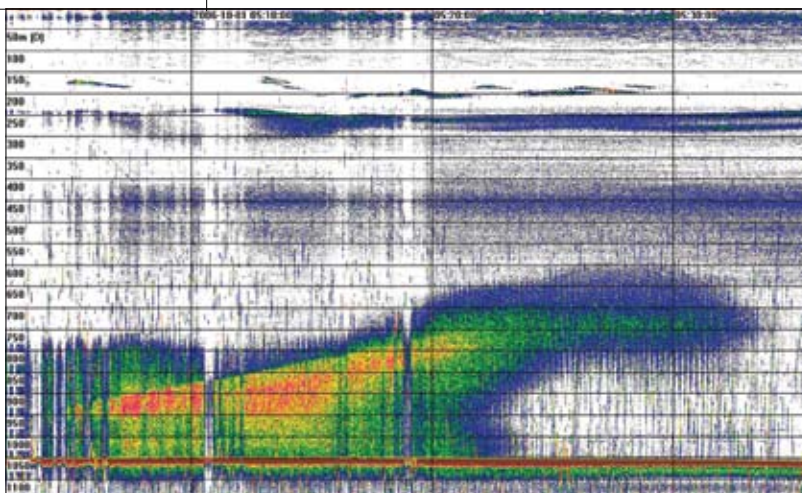
Around all this, *Kaharoa* continued its work as part of the international Argo float fleet. The floats are deployed around the world and work on a 10-day cycle of descending to 1000 metres, drifting at that depth, sinking down to as much as 2000 metres, then ascending to report via satellite. On the way up they take the 'pulse of the ocean', recording salinity and water temperature.

## Methane plumes arouse international interest

*Tangaroa's* advanced hydroacoustic sounders allowed us to record plumes of methane rising 350 metres above the seafloor off the Wairarapa coast to evaluate their effect on local chemistry and biology. "Of particular interest," says voyage leader Dr Cliff Law, "is whether the methane is diluted or oxidised in deep water, or whether it migrates to the surface in sufficient quantity to contribute to New Zealand's greenhouse gas emissions".

Methane hydrates are basically methane molecules encased in an 'ice cage', and are found deep within continental slopes all over the world. They release methane, which rises to the seafloor, bringing with it material that supports geological formations, such as carbonate chimneys, and localised ecosystems with unique life forms.

Methane hydrates are of interest for their potential as a fuel source and for their role in continental slope stability. In addition to NIWA's 2-year monitoring programme, funded by the Foundation for Research, Science & Technology, NZ EEZ seeps have also attracted international interest, forming the basis for collaborative voyages with American and German researchers.



## NIWA Research Vessels

### RV *Tangaroa*



*Tangaroa* is New Zealand's premiere research and survey vessel, equipped for hydrographic, bathymetric, oceanographic, and biological surveys, and both trawl and acoustic fisheries surveys. *Tangaroa* has an ice-strengthened hull, enabling it to operate in Antarctic waters.

### RV *Kaharoa*



*Kaharoa* is primarily a coastal and inshore vessel with hydrographic, bathymetric, oceanographic, biological, and fisheries survey capacities, but over recent years has deployed Argo floats across the Pacific to North and South America, South Africa, and Hawaii.

### *Pelorus*



*Pelorus* is a purpose-built rugged science support and hydrographic survey launch, which has been fitted out to operate in Antarctic conditions. It can be carried on and launched from *Tangaroa*.

Type:	Deepwater research vessel	Coastal research vessel	Survey launch
Year built:	1991 (Mjøllem & Karlsten Verf, Norway)	1981	1977 (fully refitted 2000)
Owner:	NIWA Vessel Management	NIWA Vessel Management	NIWA Vessel Management
Length:	70.0 m	28.0 m	10.5 m
Beam:	13.8 m	8.2 m	3.0 m
Draft:	7.2 m	3.2 m	1.0 m
Hull:	Ice-strengthened		
Cruising speed:	10.5 knots	9.5 knots	9.0 knots
Endurance:	60 days	30 days	
Crew:	14	5	
Accommodation:	30 scientific staff	6 scientific staff	
Miles steamed:	c. 980 000 nautical miles	c. 530 000 nautical miles	