

*RV Melville*



*RV Sonne*



*RV L'Atalante*



*RV Rig Seismic*



*RV Tangaroa*



*MV Geco-Resolution*

# New Zealand Continental Shelf

# REPORT

Newsletter 6 June 2003

# Contents

- 01 Final Sea Work Complete
- 02 Focus on Legal Principles
- 02 Robust Planning Reaps Rewards
- 05 Analysing and Reporting
- 05 Exploring the Opportunities



## Introduction

### Final Sea Work Complete

With the final sea work undertaken by *Research Vessel Sonne* in November 2002, the data-gathering phase of preparing New Zealand's Continental Shelf Project submission is complete.

Also complete is the first submission report, one of six regional reports being prepared from analysis of the vast amount of research carried out by the Institute of Geological and Nuclear Sciences (GNS) and National Institute of Water and Atmospheric Research (NIWA) scientists over the past four years. Preparation of the second report is already underway and work will begin very soon on the third.

In preparing the submission reports the scientists work closely with officials from the Ministry of Foreign Affairs and Trade (MFAT), whose role it will be to present New Zealand's final submission to the United Nations.

Technical aspects of the project are led and coordinated by Land Information New Zealand (LINZ), who have ensured that every aspect to date has been completed on time and within budget – a considerable achievement for such a lengthy project involving so many risks and unknown factors.

New Zealand has sovereign rights over seabed resources within its continental shelf, but the boundaries of that area are undefined. These rights are currently contained within the 200 nautical mile exclusive economic zone (EEZ). Following New Zealand's ratification of the UN Convention of the Law of the Sea (UNCLOS) in 1996, we originally had until 2006 to lodge our submission. The deadline has been extended to May 2009, a move supported by New Zealand as it assists developing nations like our neighbours in the Pacific to prepare their submissions. New Zealand is still working to the 2006 timeframe.

The research voyages undertaken over the past four years have played a key role in defining the outer limits of New Zealand's continental shelf. They have provided important information about such factors as sediment thickness and the shape of the seafloor – two critical factors in determining the precise extent of our continental shelf boundary.

The success of the project to date reflects the close liaison and interagency cooperation of the New Zealand government departments and Crown agencies involved:

- ▶ Land Information New Zealand (LINZ), which is the lead agency for the technical aspects of the Project and has responsibility for the survey programme, collection, processing, analysis and interpretation of data
- ▶ Ministry of Foreign Affairs and Trade (MFAT), which is the lead agency for all international boundary negotiations and for the



Graphic courtesy of GNS.

- ▶ presentation of New Zealand's submission to the United Nations
- ▶ The Ministry of Economic Development, whose Crown Minerals division is contracted for the long-term management and storage of the New Zealand Continental Shelf Project related data
- ▶ National Institute of Water and Atmospheric Research (NIWA), which is supplying scientific expertise
- ▶ Institute of Geological and Nuclear Sciences (GNS), which is also supplying scientific expertise.

The \$44 million project, which got underway in 1997, is already bringing benefits to the country's economy as a lot of the work is being undertaken by New Zealand organisations. The long term benefits will be significant. The Crown currently receives over \$100 million per annum from royalties and energy levies relating to the seabed resources within the EEZ. The project will enable greater control of exploration and extraction activities on the seabed to ensure environmental management and sustainability, along with significant scientific benefits such as a greater understanding of climate change issues.

### Explanation Of Terms

- ▶ **Bathymetry:** the measurement of the land under the sea, done by measuring from the water surface down to the seabed
- ▶ **Multi-beam survey:** a survey, which uses a wide swathe of sound beams to scan the seabed
- ▶ **Seismic survey:** a survey, which uses sound waves to scan below the seabed
- ▶ **UNCLOS:** United Nations Convention on the Law of the Sea
- ▶ **CLCS:** (UN) Commission on the Limits of the Continental Shelf
- ▶ **Article 76:** the criteria the United Nations sets for States to define the outer limits of their continental shelf



# Management Approach

## Focus on Legal Principles

Negotiations are progressing between New Zealand and Australia to delimit maritime boundaries ahead of finalising each country's continental shelf submissions.

Nigel Fyfe, who heads the Ministry of Foreign Affairs and Trade's (MFAT) legal team, says the focus of the negotiations is now on legal principles.

"Previous negotiations dealt with the detailed geophysical and geomorphological characteristics of the areas of joint interest. The focus now is on the legal consequences, what legal principles are relevant and how we apply them to determine the boundaries."

MFAT officials are playing an increasingly important role in the Continental Shelf Project, managing the negotiations with Australia as well as being responsible for presenting New Zealand's final submission to the United Nations.

The negotiations are conducted under the framework of the UN Convention on the Law of the Sea. They will result in agreed boundaries between the two countries in three offshore areas – Lord Howe Rise, Norfolk Ridge and Macquarie Ridge. The resource potential of these areas is unknown.

The fourth formal meeting in the New Zealand-Australian negotiations took place in Canberra in March. Nigel headed the New Zealand delegation. Other members of the MFAT team were Anna Broadhurst (Legal Division), Natalie Beath (Australia Division), Dimitri Giedelberg (New Zealand High Commission, Canberra), special advisers in international law Bill Mansfield and Don McRae, and technical adviser Ron Gelinas. They were joined by science advisers Dr Ian Wright from NIWA and Dr Ray Wood from GNS, Iain Lamont from the Navy Hydrographic Office, and Russell Turner from Land Information New Zealand (LINZ).

"The meeting focused on legal principles and other factors to underpin the negotiations," Nigel says. "Participants also had useful technical discussions on many parts of the area to be delimited."

The next meeting will be hosted by New Zealand and is expected to take place later this year.

The MFAT team is now working on New Zealand's first regional submission report. "We're reviewing treatment of legal issues in the draft report which are critical to its ongoing development," Nigel says.

As the time for presentation of New Zealand's submission to the United Nations draws nearer, Nigel says MFAT will begin to work on getting it into its final shape. "This will include testing the strength of the underpinning legal arguments and responding to developments in the Commission's consideration of other states' submissions."

Responsibility for the technical aspects of the project transferred from the Ministry of Commerce to LINZ in 1997. LINZ then commissioned a comprehensive desktop study, which identified all existing data and its value in delineating the legal boundary of New Zealand's continental shelf. The study also identified where and what type of data needed to be acquired to meet the criteria set down by UNCLOS – from deep seismic data to rock dredging. Ruth Baldwin of LINZ then used this data to support the development of a business case, the approval of which paved the way for the rest of the project. At the time Ruth likened the investment opportunity to the United States' purchase of Alaska – which time has proven to be extremely valuable.

"That gave us a clear roadmap," says Geoff. "It enabled us to determine what was already known, the quality and integrity of the data we had, and the work that needed to be done. It also meant we could prepare budgets and timelines for the project to secure the appropriation we needed from Government."

Once the Desktop Study had been peer reviewed by New Zealand and international experts Geoff was asked to establish a project team, secure funding and deliver the project outcomes. The first step was to secure the \$44 million budget, then agreements were signed with all agencies for the seven year tenure of the project.

"There was a huge amount of meticulous planning work that went on, but it has really paid dividends," Geoff says. "Every contract delivered all requirements within specification and budget. This is a really great achievement for any project, especially so for a project like this with so many risks and unknowns involved and such a long time frame."

Geoff says that accomplishment is a real tribute to everyone involved. The late Robin Pickering was a key player in the LINZ team in the early stages, as was Jerome Sheppard, Project Leader from 1999-2001.

Russell Turner, who has been with the project since 1999 and Project Leader since 2001, is justifiably proud of not only keeping within budget, but also achieving savings that have meant millions of dollars returned for reallocating to other projects.

"We achieved several million dollars of savings through foreign exchange

hedging against the major seismic contract, which was paid for in American dollars. We have also secured significant savings through our negotiations to secure vessels of opportunity to undertake survey work. By contracting the deep seismic surveys as a 16 week package and involving oil companies also needing survey work, we were able to achieve very competitive bids."

All the upfront work that went into risk management has also paid dividends, Geoff says. "We got stakeholder buy in to all the risks, so there's been no surprises. Everyone has understood our risk management and why it's been done. Having client representatives on board all the survey vessels, for example, has meant that there are no disagreements about the quality of data we've received."

Every step of the planning and management processes has been peer reviewed as further protection. Russell says the peer reviewing has been very important in giving credibility and confidence to the project. "We have peer reviewed everything, from the Desktop Study to the selection processes for the vessels we've engaged for our survey work. We also encourage internal discussion and feedback on everything – ideas are always debated and questioned, it's a complete team effort."

The Desktop Study at the heart of the project has attracted a lot of international interest and Geoff says the project team is happy to share the approach with other countries, through presentations at international conferences and through individual contacts.

"Many countries don't know how to get started, and we're happy to help," Geoff says. "We got a lot of help from Australia when we started out, as they were two years ahead of us with their project."

"It works to our advantage to share our approach with other countries. The Desktop Study has already been endorsed by the UN Commission on the Limits of the Continental Shelf, and the more countries that use it the more it becomes the accepted method."

LINZ is also happy to share the technical standards and specifications it has developed. Geoff says LINZ is acknowledged as a world leader in developing hydrographic survey specifications, which have been adopted worldwide by both industry and academia.

# Use of Resources

## Robust Planning Reaps Rewards

Robust planning combined with quality specifications, skilled staff and great cooperation from other agencies have been key to Land Information New Zealand's (LINZ) successful leadership of New Zealand's Continental Shelf Project.

Geoff Howard, LINZ's General Manager Contracts, describes it as a "model project". "The level of cooperation has been fantastic, as has the level of trust and commitment to the project from everyone involved," says Geoff. "It's been a real team effort both within LINZ and with all the other agencies and people involved."

MFAT became the lead agency for New Zealand's submission following ratification of UNCLOS in 1996. They engaged the then Ministry of Commerce to undertake an initial study of available data in the Northwest Region. Working with the then Australian Geographic Science Organisation an initial survey was carried out using the Australian *RV Rig Seismic* with Fred Smits of the National Institute of Water and Atmospheric Research (NIWA) managing the survey. Geoff says one of the first tasks was to bring all the agencies together and achieve a clear understanding of what everyone's roles and responsibilities were going to be.

"We didn't have anything to start with except for a voyage of opportunity that had been done," Geoff recalls. "The data hadn't even been processed."



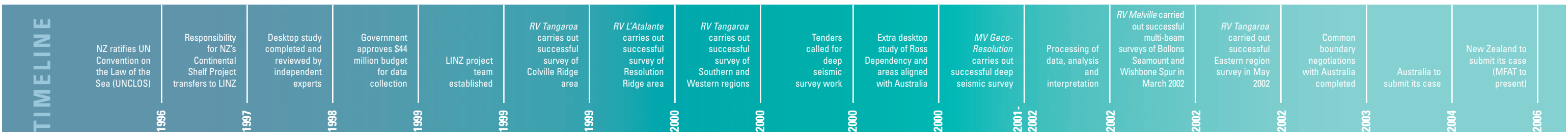
The then Chief Executives of NIWA, LINZ and GNS, (left to right) Paul Hargreaves, Russ Ballard and Andrew West at the signing of the Southern and Western region survey in 2000.

1999-2001 New Zealand Continental Shelf Project Leader, Jerome Sheppard.

The late Robin Pickering was a key player in the LINZ team in the early stages of the New Zealand Continental Shelf Project.

Geoff Howard, General Manager Contracts, LINZ (left) and Paul Young, Western-Geco (right) at the signing of the contract for the 2000 deep seismic survey.

Current New Zealand Continental Shelf Project Leader, Russell Turner.



# Analysing the Evidence

## Analysing and Reporting

Work is underway analysing the rock samples collected on the last of the sea expeditions conducted as part of New Zealand's Continental Shelf Project.

Late last year the German research vessel *RV Sonne*, equipped with deep sea dredging capability and a seafloor swath mapping system, was commissioned to collect samples from four sites on the western side of the Colville Ridge. Rick Herzer, from the Institute of Geological and Nuclear Sciences (GNS), says two of the sites yielded useful rocks.

"The objective was to test whether the rocks were of a composition that would indicate whether the small undersea ridges extending westward from the Colville Ridge were of continental origin," Rick says. "The results of swath mapping indicate that two of the sites are small seamounts rather than continental rift fault blocks. The type of rock dredged from the two sites adjacent to the Colville Ridge is currently being analysed in detail."

The *RV Sonne* also undertook a sampling survey of the Chatham Rise and Hikurangi Plateau in December 2002-January 2003 in a joint project with GNS. Although it was not a Continental Shelf Project survey, Rick says three of the dredge hauls from the Chatham Rise area have turned out to be "extremely useful" to New Zealand from an UNCLOS point of view, as well as scientifically important.

While the rock samples from the *RV Sonne's* surveys are being analysed, great progress is being made in the preparation of New Zealand's regional reports. The first one, covering the Lord Howe Rise/Norfolk Ridge was delivered to Land Information New Zealand (LINZ) in early April – a weighty 11 volumes that stacked up to a height of 50 centimetres.



Rock samples aboard the *RV Sonne* with GNS's Rick Herzer (left) and Dan Barker (right).

Vaughan Stagpoole, a member of the GNS team who worked on the report, says a great deal has been learned from the first report.

"We've developed a template to work from. We break down the work into small components that individuals can work on."

Other key members of the team who produced the first submission report were Bryan Davy, Rick Herzer and Ray Wood from GNS and Phil Barnes, Kevin Mackay, Marie Slako, John Mitchell and Ian Wright from the National Institute of Water and Atmospheric Research (NIWA). Vaughan also paid tribute to the administration support team who "nearly tore their hair out at times trying to get all the maps and diagrams correctly formatted and presented."

In January the team got together with LINZ and Ministry of Foreign Affairs and Trade (MFAT) staff, along with Iain Lamont, who served as a member of the inaugural UN Commission on the Limits of the Continental Shelf, to discuss the report and the various options for presentation. Vaughan says that as well as getting the format right, it was important to decide what strategic approach to take.

As well as the 11 volume hard copy, the first submission report also comes in an interactive CD-ROM format. It shows maps on the screen and will allow the Commissioners to click on various boundary lines and through a series of menus select all the different documentation relating to that area.

"We don't know who the Commissioners will be working on New Zealand's submission, so we want to make sure they get the material in the format they're most comfortable with – on paper or electronically," Vaughan says.

The team plan to use the same approach with the other five reports. "When they're all done we'll have another project in ensuring that they are all uniform and fit the current thinking of the Commission."

Work is already well underway on the second submission report, covering the Three Kings Ridge/Colville Ridge, and it is expected to be complete by October 2003. Work will soon begin on the third report – the Resolution and Macquarie Ridges – which Vaughan says is likely to be one of the largest in terms of the volume of information it contains.



LINZ's Russell Turner and the first New Zealand Continental Shelf Project submission report.

# Profile: Fred Smits

## Exploring the Opportunities

When Fred Smits heard a conference presentation in Townsville in 1994 about the work being done on mapping Australia's continental shelf, he got very excited. He changed his scheduled flights back to Wellington to stop off in Canberra for further discussions. As Business Development Manager for the National Institute of Water and Atmospheric Research (NIWA), Fred could see all sorts of opportunities from the continental shelf project – for New Zealand as a whole, as well as for his own organisation and the country's wider science community.

Within a few months Fred had organised a workshop at NIWA which was attended by every interested Government department and agency he could muster, and work began in earnest on the project to define New Zealand's legal continental shelf.

Fred remembers the early days of the project as a time of great excitement. "That first workshop got things moving. We undertook a study of the economic benefits and worked together on preparing two Cabinet papers to obtain the support and funding needed for the project. I had several meetings with cabinet ministers convincing them that New Zealand had to spend the millions of dollars to determine the extent of our continental shelf – we needed to put the fence around the paddock."

Initially the then Ministry of Commerce had oversight of the project and Fred worked as project director for the first submarine surveys and data processing of a joint Australian-New Zealand voyage carried out in 1996 using the Australian research vessel *RV Rig Seismic*. He then went on to project manage the Desktop Study completed in 1997, which formed the foundation for the project's work as it is today.

"The decision to go with the Desktop Study was very important. It was a very organised

approach and it has meant we have been able to get the work done within the limited budget that we had. There was a huge amount of historical data available that we could use – it took about two years to go through it all. It was also a novel approach which has since been followed by many other nations," says Fred.



Fred Smits.

A geo-technical engineer, Fred has worked on projects just about everywhere – from the Arctic to the tropics to Antarctica. He came to New Zealand from his native Holland in 1985 seeking a better life for his family and a job with less travel than he was used to. He worked for the Ministry of Works managing huge projects like the investigations and instrumentation of the landslides of the Clyde Dam and the repairs of the Matahina Dam that had been badly damaged by the 1987 Edgecumbe earthquake. In 1994 as the big civil construction projects were coming to an end he took up a new challenge at NIWA and has managed many major projects since then.

"It is fascinating work to do, working with the people involved, the expensive vessels and hi-tech equipment, the requirements of the client, the technology, the contracting, the legals, insurances and the politics – getting it all together and making it work."

While he was heavily involved with the Continental Shelf Project in its early development stages, with the sea surveys now completed and work well advanced he has a lot more time for other projects. He is very pleased that after two years of negotiation he has secured two major Japanese Antarctic research charter contracts for NIWA's research vessel *RV Tangaroa*, which he believes are well worth the 13 trips he has had to make to Japan.

Nothing will be quite as big as the Continental Shelf Project though. "There have already been huge benefits from the project – we've been able to get more scientific equipment and improve existing equipment, able to upskill our people so much, and really helped further develop New Zealand's marine science capabilities. Those have been really big spinoffs from the project's main aims."

