NIWA
Taihoro Nukurangi

Half Yearly Report for the 6 months ended 31 December 2006

National Institute of Water & Atmospheric Research Ltd and Subsidiaries

Financial Results

NIWA Group has made an operating surplus before taxation of $6.6 million, against a budgeted surplus of $2.3 million for the 6 months ended 31 December 2006. The operating surplus is ahead of budget as a result of unbudgeted overseas project revenue which has resulted in better utilisation of NIWA's research vessels and an increase in commercial revenue earnings for the period. A further contributor to the result is research related subcontractors and expenditure that has been slower that budgeted, but is expected to increase over the next half of the year. Sufficient work has been secured to be confident that we will exceed our year-end revenue target if all work can be completed as scheduled.

$3.0 million has been utilised on the acquisition of property, plant, and equipment, against a capital expenditure budget of $4.4 million for the 6 months to 31 December 2006.

The closing cash position on 31 December 2006 was $2.2 million. A dividend of $100,557.70 was declared and paid in January 2007. The Shareholder used the dividend as part of the funding for the Kiwi Advanced Research and Education Network.

At this stage the Board expect the operating surplus before tax for the year ending on 30 June 2007 to materially exceed the budget of $8.3 million.

Governance and Management

In this period NIWA has continued to operate in accordance with the Crown Research Institutes Act 1992 and the Companies Act 1993.

A suite of non-financial performance indicators covering science delivery, partnership building, stakeholder engagement, human resources development, and health and safety are monitored and reported to the Board. The Board has identified ten key risks to the NIWA Group, and progress towards mitigating these risks is reported on monthly.

Chief Executive, Dr Rick Pridmore, retired effective from 5 December 2006. The Board has engaged a recruitment company to conduct an international search for a new Chief Executive. An appointment is expected by the end of March 2007.

Collective Employment Agreement

A new Collective Employment Agreement has been signed with the Public Service Association. This agreement will remain in force until 1 July 2009.

Contracted Obligations

NIWA is on target to meet all its contracted obligations in public good science, fisheries research, and consulting. Some notable achievements in the 6-month period are noted below.

Aquaculture

Towards premium oysters
The first spawning of Pacific oyster broodstock at Bream Bay Aquaculture Park has taken place as part of the development of a hatchery-based method for evenly seeding oyster sticks so that more premium grade oysters are produced. These oyster sticks have now been transferred to a commercial partner where we will assess their performance in producing premium oysters for the market.

Kingfish Go Wild
A substantial contribution was made by NIWA's kingfish rearing programme to *Kingfish Go Wild* – an initiative coordinated by the New Zealand Recreational Fishing Council to enhance the wild fishery. NIWA transported, tagged, and released about 6500 large kingfish (over 1 kg). Release points included Houhoura, Whangaroa, Russell, and the Hauraki Gulf. The transport of these large fish pushed NIWA's fish transporters well beyond their normal operating range. The gas balancing system used on the fish transporter, developed through previous NIWA research, exceeded performance expectations by allowing loads of 200 kg of fish per cubic metre of water, with survival to the point of release being greater than 99%.

El Niño affects mussel productivity
The period from 1997 through to 2002 was a difficult one for mussel farmers. Average meat yield from the farms declined dramatically, while the time to grow the mussels to the size demanded by the markets increased dramatically. The cause was not known. Long-term data collected with the assistance of mussel industry organisations and private companies have, for the first time, has allowed us to examine the possible influence of the El Niño Southern Oscillation (ENSO) climate cycles. The analyses have shown clear linkages between ENSO-driven variation in physical variables (wind stress, sea temperature, river flows, and nutrient supply), phytoplankton population structure, and mussel yield from the marine farms. This is a significant finding because it confirms that the major decline in mussel yield observed on mussel farms between 1997 and 2002 was not caused by too many farms being established in the growing area; it was caused by climatic drivers of the environment reducing both riverine and oceanic nutrient supply to the growing waters during that period. In response to changes in the ENSO cycle in 2004–05, farm productivity has now returned to pre-1997 levels.

Aquatic Biodiversity & Biosecurity

Marine Invertebrate Collection now on the Web
NIWA's Marine Invertebrate Collection, after many months of careful auditing, is now accessible through NIWA's internet site. The type collection contains more than 2300 type 'lots', and can be searched by organism name, publication date, author, and locality (among other parameters).

Freshwater fish database continues to grow
NIWA's freshwater fish database has achieved a milestone with its 200th registered user added to the database at the same time as it acquired its 25 000th record. It is now likely to be one of the largest databases of its kind in the world. Although there are still some gaps in coverage, the value of more presence/absence data on fish is becoming limited, and an emphasis is now being placed on archiving quantitative data.

Deepsea coral diversity
NIWA staff were amongst the main authors of an international report published by the UN Environment Programme (UNEP) on the vulnerability of deepsea corals to fishing on seamounts

in the high seas. The executive summary was circulated at the United Nations Intergovernmental Review in New York, and the resulting discussions received widespread international press coverage. The report reviewed coral distribution in the high seas around the world, and compared predicted coral distributions with the distribution of fishing activity, highlighting the potential vulnerability of deepsea corals to damage from fishing.

Tangaroa *voyage discovers world's largest cold seep*
Seven NIWA staff participated in a highly successful joint NZ/US voyage that located and described for the first time the macrofauna assemblages at cold seeps on New Zealand's eastern continental margin. This was the first such investigation in the southwest Pacific and discovered what may well be the largest cold seep habitat known worldwide. Seep areas were mapped and sampled using a combination of swath-mapping, acoustic identification of methane bubble plumes, camera surveys (using NIWA's new deep-towed imaging system, DTIS), and grabs and dredge deployment. The voyage was the first stage in an international research programme led by US and NZ institutions – funded in this case by the US National Oceanic & Atmospheric Administration and NIWA – to compare chemosynthetic ecosystems in the New Zealand region (other habitats are hydrothermal vents, whale falls, and sunken wood).

Aquatic disease guide for fisheries and aquaculture
NIWA has completed a 460 page document reviewing aquatic diseases considered significant to fisheries and aquaculture in New Zealand. Information covers disease epidemiology, diagnosis, disinfection, treatment, and distribution of 92 diseases with the potential to adversely affect these sectors. The review is intended as a valuable resource for industry stakeholders, providing information for importation risk analysis purposes as well as management of aquatic diseases at the farm level.

Pest fish reduce lake water quality
NIWA research has determined that exotic fish such as rudd, tench, perch, goldfish, and catfish have reduced the water clarity in many of New Zealand's smaller lakes, and that this impact increases with the number of species introduced, particularly if the species include a mixture of planktivores, benthivores, and herbivores. This finding means that regional council concerns over pest fish will now need to include water quality decline as well as impacts on native fauna and loss of biodiversity. A paper describing the link between pest fish presence and reduced water quality in New Zealand lakes has just been accepted for publication in an international journal.

Modelling marine invasions
Good progress has been made on NIWA's epidemiological model of invasive marine species. Many marine non-indigenous species establish initially within human transport hubs, such as shipping ports and marinas, and are then spread to other locations by vectors leaving the infested hub. This stepping-stone type of invasion resembles the epidemiology of human disease. NIWA developed and parameterised an epidemiological model, based on standard Susceptible-Infected-Resistant models used in medical science, to simulate the transport of non-indigenous fouling species around New Zealand by yacht movements. The model was used to evaluate the impact of three control options (improved hull maintenance, quarantining infected vessels and marinas, and attempted eradication) on the rate of spread of a simulated invader. Results showed that, over a 10-year period, improved hull maintenance is the most effective strategy for preventing non-indigenous species spread. This important information shows managers that resources are better directed at preventative efforts than at reactive efforts in response to incursions.

Didymo survivorship
Laboratory trials on the invasive alga *Didymosphenia geminata* are showing that cells can survive for much longer than anticipated, especially at lower temperatures. For example, at 12 degrees Celsius under moderate light levels, cells were still viable over two months after

removal of the colonies from an affected river. These findings explain how this alga could quite easily have reached New Zealand initially, and also highlight the extreme risk of *Didymosphenia* appearing in North Island rivers, which are currently *Didymosphenia*-free.

Assessing aquatic weed risks for Australia
NIWA has been selected to play a key role in an Australian government programme to identify high risk aquatic plants for national and regional trade bans, with the risk assessment approaches we have developed for New Zealand being applied to Australia. The analysis will also extend our knowledge of freshwater weed threats to New Zealand and will enable further rigorous testing of risk assessment protocols. The project will confirm the identity of aquatic plants traded in Australia, modify the New Zealand 'Aquatic Weed Risk Assessment Model' for Australian conditions, and experimentally assess the growth strategies of candidate plants for different climate zones in Australia.

Fisheries

Antarctic fisheries research
NIWA continues to make a significant contribution to the Convention for the Conservation of Antarctic Living Marine Resources, an important and highly visible international fisheries forum, with 14 papers tabled at the annual meeting in Hobart, covering a wide range of research related to the toothfish fishery in the Ross Sea. NIWA's CASAL stock assessment software is now accepted as a standard method for assessment and yield calculations. The assessments suggest long-term yields of about 3000 tonnes from the Ross Sea region, and a further 300–400 tonnes from Area 88.2E.

Chilean fisheries stock assessment
Chile has some very substantial fisheries for which they are looking to apply stock assessment approaches like those operating in New Zealand. At the request of the Chilean fisheries research organisation, Instituto de Fomento Pesquero, we have assisted in assessing the status of Chilean hoki, hake, and southern blue whiting resources. Subsequently, discussions were held with a Chilean science delegation on future opportunities during the President of Chile's visit to New Zealand.

Crayfish larval transport
Satellite-derived ocean currents have been used to model the pathways of the New Zealand red rock lobster, *Jasus edwardsii*, to build a statistical picture of settlement around the coast of New Zealand. The model is able to capture the observed patterns of dispersal and settlement, and its success relies on combining estimates of the circulation around New Zealand with larval transport and (simple) physiology. Results suggest four major geographical areas in larval dispersal. The far north of the North Island and the northeast coast of the North Island both seem to have settlement from a variety of sources. However, the south of the South Island and the Chatham Islands appear to be locally sourced, and may therefore be more vulnerable to fisheries impacts on the local population.

Toheroa – will they recover?
Toheroa abundance has declined nationally. Bluecliffs Beach in Southland is no exception, with populations falling from over 2 000 000 adults in the 1960s to about 80 000 in the 1990s and to the present. The initial declines were due to over-harvest, but the populations have continued to decline since the total harvest ban in 1980. A review of the reasons for the continued decline shows that, although toheroa historically occupied the entire beach, by the late 1990s they were concentrated in one limited area. A combination of long-term aerial photo analyses with more recent measurements of beach profiles has revealed significant erosion of Bluecliffs Beach since the mid 1980s which has exposed underlying coarse gravels and cobbles. Toheroa require a

sandy substrate, and now only 54% of the beach is sand. It is predicted that with the continued erosion the remaining toheroa population is at risk.

Freshwater

Downstream impacts of water allocation
Hydropower and irrigation dam operations typically reduce the magnitude of floods and alter the balance between downstream river sediment supply and transport capacity. A NIWA numerical model to predict the downstream impacts of such water-allocation operations has shown that many gravel-bed rivers undergo a relatively rapid adjustment in the proportion and distribution of different sizes of riverbed surface material over a time-scale of a few decades, followed by a much slower adjustment of their bed levels lasting centuries and longer. The initial rapid adjustment is most relevant to water resource consents, which typically are provided for several decades. This river numerical model should eventually be able to interface with a similar NIWA model being developed to predict coastal shoreline erosion, so that catchment-to-coast effects of water allocation proposals can be predicted.

Low-light life in Antarctica
In collaboration with the United States Long Term Ecological Research project on lake ecology, NIWA's Antarctic Aquatic Ecosystems programme has provided the first proof of low light photosynthesis on the floor of Lake Hoare, an 18 m deep lake with a perennial ice cover 5 m thick. This work has advanced our understanding not only of how life survives and functions in near-dark, permanently ice-covered lakes, but also of how layers of these algae provide a hidden geological record of Antarctic conditions.

New Zealand lake water quality
The largest ever nationwide assessment of lake water quality in New Zealand, using data from 120 lakes to investigate the current status of lakes in relation to land use, climate, and geography has been completed for the Ministry for the Environment. Clear correlations between lake water quality and catchment land cover were demonstrated, identifying how catchments in pasture or exotic forest contribute to poorer water quality in lakes than catchments retaining high native cover. A nationwide model was developed that showed that approximately half of all New Zealand lakes are still likely to have good or excellent water quality, but that some 40% of New Zealand lakes are likely to have water quality ranging from poor to extremely poor. These findings are of considerable importance for New Zealand's State of the Environment reporting, for land use planning in protecting lake water quality, for preventing further degradation, and for lake restoration.

Coasts

Effect of trace metals on biota
Comparisons of biomarker, physiological, and ecological responses in Auckland Harbour are providing strengthening evidence that trace metal contamination affects coastal benthic biota. Significant effects on cockle growth and vigour, DNA integrity, and genetic diversity were observed along gradients of trace metal contamination below currently accepted sediment quality criteria.

New Zealand beach classification
A classification of New Zealand beaches, and revision of the international beach state classification methodology, has been undertaken with collaborators from Australia. The team built a dataset for 230 beaches that varied in wave climate, tide range, and sediment type, fundamental parameters that determine beach type and associated hazards relating to property (erosion and flooding) and water safety (rips). The strong geological control on New Zealand beaches emerged in the preliminary analysis. Merging this dataset with that for Australian beaches will incorporate beaches with a much greater range of sediment types and wave

conditions, and make the existing beach morphodynamic state model, which emerged in the mid 1980s, more global in its application.

Oceans

Submarine explosive volcanism
Seafloor multibeam mapping and a series of submersible dives has been successfully completed from the Japanese research vessel *Yokosuka* along an active rift system to the immediate north of New Zealand. The project evolved through collaboration with the Japan Marine Science and Technology Centre (JAMSTEC). The voyage has mapped completely three new rifts (one over 4000 m deep), and identified new areas of recent seafloor volcanism within these rifts, which provides new insight on how new seafloor can be formed. One rift shows evidence of a pronounced seawater temperature anomaly, and is probable evidence of deep active hydrothermal venting. Biodiversity on this very young seafloor is low. The focus of the project now moves to detailed geochemical analysis of the sampled rocks to 'fingerprint' the source of the erupting lavas. This information will improve our understanding of active geological processes along the Kermadec Trench and within our Exclusive Economic Zone, which could have implications for mineral exploration and hazard management.

French Research Institute for Exploitation of the Sea
The backscatter signal recorded by multibeam echosounders may potentially provide a way to remotely characterise seafloor substrates. Processing of the backscatter is very complex and is new to New Zealand. A new collaborative effort with the French Research Institute for Exploitation of the Sea (IFREMER) has focused on processing backscatter data acquired in the wider Cook Strait region, using highly specialised IFREMER software. This exercise has revealed significant detail of the seafloor. Of particular interest are high backscatter intensity associated with remnant hydrothermal vents on the Wairarapa Shelf; unexplained low reflectivity lineaments on the west side of central Cook Strait, possibly associated with geological features, but also potentially man-made; and low reflectivity ridges on Cook Strait floor.

Uptake of carbon dioxide by the ocean
A new wind-speed parameterisation developed by NIWA and the University of Columbia (USA) has led to new estimates of the uptake of carbon dioxide by the ocean. The Southern Ocean carbon sink is a major uncertainty in the global carbon budget, and this analysis confirmed that the Southern Ocean accounts for 40% of the total ocean uptake. This estimate, combined with our recent measurements in subantarctic waters, will provide a valuable constraint on this sink for atmospheric carbon dioxide.

Atmosphere

Improved chemistry-climate model
An improved version of the three dimensional coupled chemistry-climate model "UMETRAC" (Unified Model with Eulerian transport and chemistry), which estimates the total amount of each chemical species in a vertical column of the atmosphere, has been completed and initial tests carried out. The improved version extends the species modelled to include the short-lived ones that play important roles in understanding climate-related ozone loss processes. Initial comparisons with measured nitrogen dioxide amounts at Lauder suggest that the new column model produces improved estimates compared with previous results.

Transit times for air pollutants
New and valuable data on the transit times for air pollutants crossing from the Northern to the Southern Hemisphere have been obtained as part of a joint NIWA-US-Japanese programme using Japanese ships to collect air samples in the Western Pacific region. For example, recent

transits have detected Asian outflow extending south to the equator, and signatures of a methane plume from the Waikato reaching 12 degrees South. Recent results from NIWA's unique work on the isotopic composition of atmospheric methane have shown larger than expected contributions from fossil sources of methane and the importance of chlorine in the marine boundary layer for removing atmospheric methane.

Greenhouse gas emissions
New high-resolution paddock-scale measurements of greenhouse gases have, for the first time, shown pulses of gas emission directly resulting from livestock, rain and irrigation. The month-long project "FarmGas06" assessed nitrous oxide emissions (a greenhouse gas bi-product of soil nitrogen cycling) and methane emissions from a herd of 700 cattle. The collaboration with Agriculture Canada, and Landcare Research was the first time in New Zealand that three "high tech" micrometeorology approaches to measuring greenhouse gas concentration and flux have been used simultaneously alongside traditional chamber techniques. The results could be used in future to guide and validate farming practices to minimize greenhouse gas emissions.

Climate change modelling
Our first suite of simulations of future New Zealand climate change using a high resolution regional climate model run on our supercomputer have been completed. By the end of this century, under a 'middle of the range' emissions scenario, the simulation predicted increased frequency in heavy precipitation. These extreme events would affect most of the country including locations where the annual rainfall totals show little change. Such events often lead to flooding, and the research indicates the need for long term flood protection planning. By the 2080s the daily temperatures simulated for most of New Zealand are on average about 4 degrees warmer. Examination of two daily temperature-based indices (growing degree days and number of days of frost), shows that the percent of New Zealand's land area potentially suitable for growing grapes increases significantly over the coming century.

Methane 'events' and rapid climate change
11,600 years ago, in an event known as the Younger Dryas, atmospheric methane increased by 50% and temperature by up to 5 degrees Celsius in what could have been as short a period as 20 years. Ground breaking research on this event was completed in July 2006 in a joint project between NIWA and Scripps Institute of Oceanography, California. Analysis of air trapped in bubbles in ice cores collected from Greenland show that, although methane did increase dramatically through the event, its radiocarbon content did not. This surprising result implies that biological rather than fossil sources of methane played the major role in the shift in methane concentration and will force a re-evaluation of the impact of sudden releases of methane on the Earth's past climate.

Natural Hazards

Tsunamis from the past

Tsunamis are rare events over the time-scale of a human lifetime. However, evidence for pre-historic tsunamis is written in the geological and archaeological record. NIWA has analysed evidence from prehistoric tsunamis in New Zealand from Okarito Lagoon on the west coast of the South Island, where tsunami inundation and concurrent major landscape alterations occurred in the 15th century. Another study focused on a site occupied for a brief period by moa hunters about 1300 AD on the Wairau Bar. These results, with sites identified for future studies, could change the way in which we view the frequency and severity of the tsunami hazard along New Zealand's coast.

Saving swimmers with science
Rip currents pose a hazard to swimmers because they are difficult to see from the shore, they cut channels and holes in the seabed, and swift currents carry swimmers out to sea. Where and when

they occur is difficult to predict. By combining video-monitoring observations of rip currents at Tairua Beach (Coromandel) with wave and tide forecasts for the period 2001–05, we have developed a probabilistic model for forecasting rip-current occurrence. The presence or absence of rips was correctly predicted 77% of the time. The robustness of the probabilistic model could be improved by additional data, particularly for more extreme wave parameter combinations. Further tests are being run at Tairua this summer in conjunction with the local surf club.

NIWA Vessel Management Ltd

We anticipate RV *Tangaroa* utilisation to be close to the 2006–07 Business Plan budget of 315 days, and RV *Kaharoa* will spend more than 200 days at sea this financial year, compared with a budget of 163 days. RV *Kaharoa* continues to be heavily used by a global climate and oceans programme led from the United States, deploying robotic ocean profilers through the Southern, Indian, and Pacific Oceans.

Sue Suckling
Chair

Bryce Cooper
Acting Chief Executive

February 2007

National Institute of Water & Atmospheric Research Group

Statement of Financial Performance

For the 6 months ended 31 December 2006

	Note	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Revenue		50,202	42,190	106,414
Operating surplus before taxation	2	**6,603**	**1,460**	**15,706**
Taxation expense		(2,179)	(836)	(5,364)
Net surplus		**4,424**	**624**	**10,342**
Net surplus comprises:				
Parent interest		4,424	651	10,422
Minority interest		–	(27)	(80)
		4,424	**624**	**10,342**

The accompanying 'Notes to the Financial Statements' are an integral part of, and should be read in conjunction with, this 'Statement of Financial Performance'.

National Institute of Water & Atmospheric Research Group

Statement of Movements in Equity

For the 6 months ended 31 December 2006

	Note	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Net surplus for the year:				
Parent interest		4,424	651	10,422
Minority interest		–	(27)	(80)
Foreign currency translation reserve movement		(103)	553	200
Total recognised revenues and expenses		**4,321**	**1,177**	**10,542**
Distributions to owners				
Dividends		–	–	(13,000)
Movements in equity for the period		**4,321**	**1,177**	**(2,458)**
Equity at the beginning of the period		41,232	43,690	43,690
Equity at the end of the period		**45,553**	**44,867**	**41,232**

The accompanying 'Notes to the Financial Statements' are an integral part of, and should be read in conjunction with, this 'Statement of Movements in Equity'.

National Institute of Water & Atmospheric Research Group

Statement of Financial Position

As at 31 December 2006

	Note	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Equity				
Share capital		24,799	24,799	24,799
Retained earnings	3	20,612	19,417	16,188
Foreign currency translation reserve		161	617	264
Shareholders' interest		45,572	44,833	41,251
Minority shareholders' interest		(19)	34	(19)
Total equity		**45,553**	**44,867**	**41,232**
Non-current liabilities				
Unsecured loans		414	409	452
Employee entitlements		1,517	1,627	1,551
Total non-current liabilities		**1,931**	**2,036**	**2,003**
Current liabilities				
Payables and accruals		19,158	22,399	17,192
Tax payable		845	–	26
Short-term advance facility		–	–	600
Employee entitlements		4,625	4,478	7,705
Total current liabilities		**24,628**	**26,877**	**25,523**
Total equity and liabilities		**72,112**	**73,780**	**68,758**
Non-current assets				
Property, plant, & equipment		41,569	42,634	42,740
Identifiable intangibles		88	142	117
Investments		536	98	491
Future income taxation benefit		1,804	1,446	1,816
Receivables and prepayments		309	366	871
Total non-current assets		**44,306**	**44,686**	**46,035**
Current assets				
Cash and short-term deposits		2,245	5,667	1,143
Receivables and prepayments		11,032	13,434	17,539
Taxation receivable		–	454	–
Inventory and uninvoiced receivables		14,529	9,539	4,041
Total current assets		**27,806**	**29,094**	**22,723**
Total assets		**72,112**	**73,780**	**68,758**

The accompanying 'Notes to the Financial Statements' are an integral part of, and should be read in conjunction with, this 'Statement of Financial Position'.

National Institute of Water & Atmospheric Research Group

Statement of Cash Flows

For the 6 months ended 31 December 2006

	Note	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Cash flows from operating activities				
Cash was provided from:				
Receipts from customers		63,431	55,167	105,215
Interest received		154	176	386
Cash was disbursed to:				
Payments to employees and suppliers		(57,477)	(44,298)	(76,925
Interest paid		(3)	(1)	(50)
Taxation expense paid		(1,347)	(1,187)	(5,606)
Net cash inflow from operating activities	4	**4,758**	**9,857**	**23,020**
Cash flows from investing activities				
Cash was provided from/(applied to):				
Sale of property, plant, & equipment		24	–	76
Purchase of property, plant, & equipment		(3,072)	(3,758)	(8,480)
Purchase of intangible assets		–	–	(95)
Investment in associates		(8)	(95)	(535)
Net cash outflow from investing activities		**(3,056)**	**(3,853)**	**(9,034)**
Cash flows from financing activities				
Cash was provided from/(applied to):				
Dividends paid to shareholders		–	–	(13,000)
Unsecured loan received/(repaid)		–	6	–
Associate loan payment		–	–	(100)
Short-term advance facility repayment		(600)	(1,700)	(1,100)
Net cash outflow from financing activities		**(600)**	**(1,694)**	**(14,200)**
Net increase/(decrease) in cash held		**1,102**	**4,310**	**(214)**
Opening cash balance		1,143	1,357	1,357
Closing cash balance		**2,245**	**5,667**	**1,143**

The accompanying 'Notes to the Financial Statements' are an integral part of, and should be read in conjunction with, this 'Statement of Cash Flows'.

1. Statement of accounting policies

There have been no changes to the accounting policies stated in the 2006 annual report. These policies have been consistently applied during the 6 months ended 31 December 2006.

These interim financial statements have been prepared under the requirements of FRS-24: Interim Financial Statements. They should be read in conjunction with the 2006 annual report.

(a) Basis of consolidation

The financial statements are for the NIWA Group only. This comprises the Parent company (the National Institute of Water and Atmospheric Research Limited), its subsidiaries (NIWA Vessel Management Limited, NIWA Australia Pty Ltd, NIWA Environmental Research Institute, NIWA (USA) Inc., NIWA Natural Solutions Limited, and Unidata Pty Ltd), and the Group's interest in associates (CRL Energy Ltd, Ensid Technologies Ltd, and Ensid Investments Ltd – the last two were sold in August 2006). The NIWA Group financial statements are accounted for using the purchase method except for the associates, which are accounted for using the equity method. The group recognises its share of the associates' net surplus or deficit for the year as operating revenue in its statement of financial performance. The group recognises its share of other post-acquisition movements in reserves in its statement of movements in equity. All significant intercompany transactions are eliminated on consolidation.

(b) Comparatives

The financial statements for the 6 months ended 31 December 2006 and for the comparative 6 month period to 31 December 2005 are unaudited. The comparative figures for the year ended 30 June 2006 are extracted from the audited financial statements at that date.

(c) Implementation of New Zealand equivalents to International Financial Reporting Standards

New Zealand reporting entities are required to comply with the New Zealand equivalents of International Financial Reporting Standards ('NZ IFRS') for reporting periods commencing on or after 1 January 2007, with optional adoption for reporting periods commencing on or after 1 January 2005.

NIWA intends to adopt NZ IFRS for the year ending 30 June 2008, and accordingly the first report using NZ IFRS will be for the half year ended 31 December 2007. The transitional rules for the first time adoption of NZ IFRS require NIWA to restate its comparative financial statements using NZ IFRS. The majority of the adjustments required on transition will be made to opening retained earnings in the opening NZ IFRS balance sheet as at 1 July 2006.

During the year ended 30 June 2006 NIWA completed a preliminary review of its accounting policies and financial reporting against the requirements of NZ IFRS. NIWA recognises that it will be required to restate the Statement of Financial Position of the comparative period financial statements in accordance with the version of NZ IFRS applicable at the first NZ IFRS reporting date. Changes continue to be made to NZ IFRS, and there may be further changes to the information disclosed. It should therefore be noted that the actual impact of adopting NZ IFRS may vary from the information presented, and this variation may be material.

NIWA has compiled an opening balance sheet based on the current version of NZ IFRS as at 1 July 2006. Based on the results of the information gathered in this process and the review of policies, NIWA does not expect its financial results or financial position to be materially different under NZ IFRS from that currently reported, other than in the format and level of disclosure as presented in this report.

Set out below are the key areas where accounting policies may change and have an impact on the financial reports of NIWA.

(i) Income taxes
Adoption of NZ IFRS is not expected to impact significantly on the tax expense reported, though a 'balance sheet' approach will be adopted in the recognition of deferred tax, replacing the 'income statement' approach under current NZ GAAP.

(ii) Carrying value of land and other assets
NIWA is currently reviewing its assets to determine which, if any, should be revalued as a one-off adjustment on first time adoption of NZ IFRS.

(iii) Impairment of assets
Adoption of NZ IFRS will require additional procedures to perform the impairment testing required, but is not expected to impact significantly on the carrying values currently reported.

(iv) Financial instruments: recognition and measurement
NIWA has elected not to hedge account. Therefore, any derivatives held will be recognised at fair value in each period. Given the current level of hedging and short-term nature of most hedges, no significant impact is anticipated. Higher volatility of earnings from period to period may result as the reported impact of a hedging instrument may now fall in a different reporting period to the impact of the underlying risk.

(v) Intangible assets
On conversion to NZ IFRS, computer software that is not an integral part of the related computer hardware will be reclassified from tangible to intangible fixed assets. There will be no net impact on equity.

(vi) Foreign currency translation reserve
On transition to NZ IFRS, the foreign currency translation reserve will be transferred to opening retained earnings. There will be no net impact on opening equity or earnings as a result of this adjustment.

2. Operating surplus before taxation

	Group 6 Months to Dec 06 Unaudited ($000s)	**Group** 6 Months to Dec 05 Unaudited ($000s)	**Group** 12 Months to Jun 06 Audited ($000s)
The operating surplus before taxation is stated after charging/(crediting):			
Interest expense	3	1	50
Depreciation	4,210	4,380	8,743
Amortisation of identifiable intangible assets	19	–	39
Directors' fees	132	143	284
Net loss/(gain) on sale of property, plant, & equipment	(49)	89	310
Renting and operating lease costs	499	501	973
Donations	–	–	–
Remuneration of auditor:			
Deloitte – audit fees	57	21	109
Deloitte – other services	–	–	–

3. Retained earnings

	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Balance at beginning of the year	16,188	18,766	18,766
Add net surplus	4,424	651	10,422
Less dividend paid	–	–	(13,000)
Balance at end of the year	**20,612**	**19,417**	**16,188**

4. Reconciliation of net surplus to net cash inflow from operating activities

Net surplus	**4,424**	**624**	**10,342**
Add/(less) items classified as investing activities			
Net loss/(gain)on disposal of property, plant, & equipment	(49)	(89)	310
Add/(less) non-cash items			
Share of associate's deficit for the year	(37)	44	91
Depreciation	4,210	4,380	8,743
(Surplus)/deficit attributable to minority interests	–	–	80
Amortisation of identifiable intangibles	19	2	39
(Gain)/loss on foreign currency loan	30	6	(115)
Unrealised changes in the value of subsidiaries	(103)	553	200
Increase/(decrease) in employee entitlements	(34)	29	(47)
(Increase)/decrease in future income taxation benefit	12	14	(356)
	4,097	**5,028**	**8,635**
Add/(less) movements in working capital items			
Increase/(decrease) in payables and accruals	2,785	9,236	4,029
Increase/(decrease) in employee entitlements	(3,080)	(1,800)	1,427
(Increase)/decrease in receivables and prepayments	7,069	2,129	(2,377)
(Increase)/decrease in inventory and uninvoiced receivables	(10,488)	(4,944)	553
(Increase)/decrease in taxation receivable	–	(327)	101
	(3,714)	**4,294**	**3,733**
Net cash inflow from operating activities	**4,758**	**9,857**	**23,020**

5. Commitments

5a Operating lease obligations

	Group 6 Months to Dec 06 Unaudited ($000s)	Group 6 Months to Dec 05 Unaudited ($000s)	Group 12 Months to Jun 06 Audited ($000s)
Obligations payable after balance date on non-cancellable operating leases:			
Within 1 year	1,011	944	984
Between 1 and 2 years	972	804	885
Between 2 and 5 years	2,152	1,953	2,237
Over 5 years	5,060	3,718	3,468
	9,195	**7,419**	**7,574**

5b Capital commitments

Commitments for future capital expenditure:			
Approved, but not contracted for	4,609	3,444	–
Contracted, but not provided for	1,386	778	98
	5,995	**4,222**	**98**

6. Contingent liabilities

The New Zealand companies have a contingent liability in respect of the Accident Compensation Commission's residual claims levy. The levy will be payable annually from May 1999 for up to 15 years. Each company's future liability depends on ACC's unfunded liability for past claims and future payments to employees by these companies. There are no other significant contingent liabilities that require disclosure in the financial statements.

7. Subsequent events

Subsequent to 31 December 2006 a dividend of $100,557.70 was declared and paid to the shareholders in January 2007.

National Institute of Water & Atmospheric Research Limited
Directory

BOARD OF DIRECTORS

Sue Suckling, *Chair*

John Spencer, *Deputy Chair*

Miranda Cassidy (Resigned 30 September 06)

John Hercus

Dr Graham Hill

Ed Johnson

Troy Newton

David Sharp

Wendy Lawson

EXECUTIVE MANAGEMENT

Dr Bryce Cooper, *Director, Strategic Development & Acting Chief Executive*

Dr Mark James, *Director, Operations*

Dr Rob Murdoch, *Director, Research*

Kate Thomson, *Chief Financial Officer & Company Secretary*

Dr Clive Howard-Williams, *General Manager, Freshwater & Coasts*

Dr John McKoy, *General Manager, Fisheries*

Dr Murray Poulter, *General Manager, Atmosphere, Natural Hazards, & Energy*

Dr Don Robertson, *General Manager, Aquatic Biodiversity & Biosecurity*

Dr Charlotte Severne, *General Manager, Māori Development & Oceans*

Dr Barry Biggs, *General Manager, Environmental Information & International*

Solicitors

Bell Gully Buddle Weir
Kaimai Law

Auditors

Deloitte on behalf of the Auditor-General

Bankers

The ANZ National Bank of New Zealand Limited

Insurance Broker

Marsh Limited

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