

Antarctica New Zealand

New Zealand Antarctic Institute



ANNUAL REPORT
2000 2001

Vision

Antarctica: refreshing global ecosystems and the human spirit

Mission

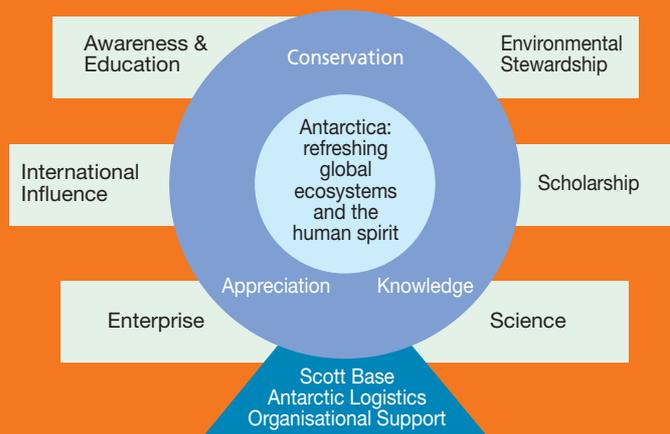
Advancing knowledge, appreciation and conservation, of Antarctica and the Southern Ocean

For the benefit of New Zealand and the world community

Through leadership, partnership and involvement in high quality Antarctic related activities.

Goals

To advance knowledge, appreciation and conservation of Antarctica and the Southern Ocean, and hence meet New Zealand's national interests in the region, requires activities focused on environmental stewardship, science, scholarship, awareness and education, enterprise and international influence. This is based on effective operation of Scott Base and provision of logistics and organisational support services.



Front Cover: Deep Time
Photographer Justine Lord



Raewyn Atkinson

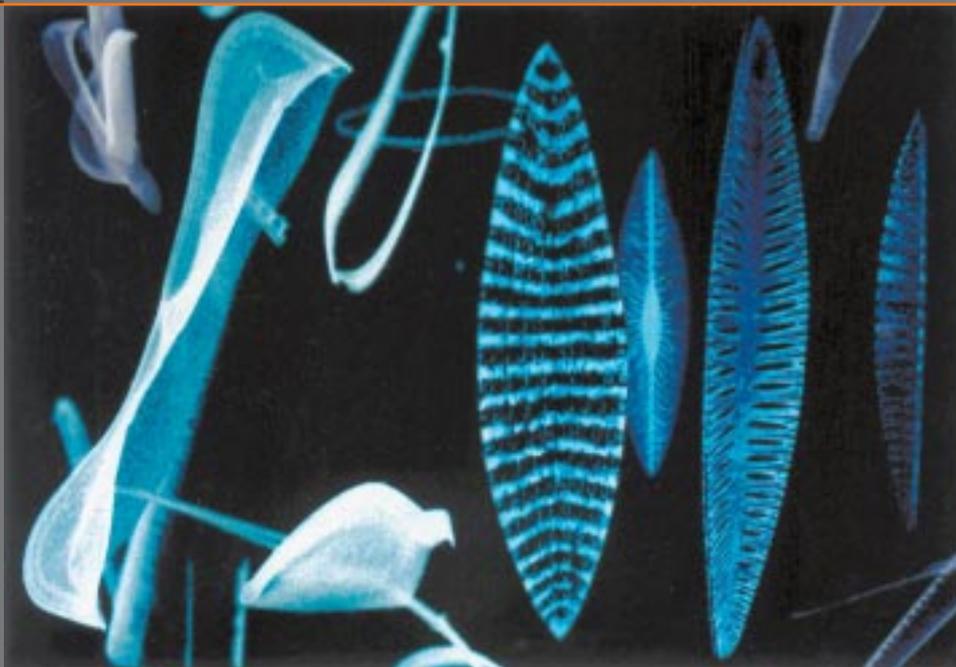
Ceramacist,
Antarctic Arts Fellow 2000/2001

Antarctica New Zealand

New Zealand Antarctic Institute

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Virginia King



The Artists to Antarctica Programme celebrates its fifth season this year. We acknowledge some of the artists' work in the annual report.

Chairman's Report

The year 2000/2001 has been another successful and exciting one for Antarctica New Zealand. Representing New Zealand's Antarctic and Southern Ocean interests as the specialist Crown agency is always a challenge, and this year has been no exception. On and off the Ice we have again supported an excellent range of projects and, despite increases in fuel and other operating costs, we have achieved our financial objective of operating to a balanced budget.

The Ross Sea Region State of the Environment Report has been an important focus for Antarctica New Zealand over the past two years. This initiative is nearing completion with publication of the report expected in November 2001. The report is the first state of the environment report prepared for Antarctica, and will provide a basis for identifying future research and environmental management priorities. It represents a significant national commitment to environmental stewardship of Antarctica and the Southern Ocean. We must also thank science colleagues in other countries, in particular Italy and the USA, for their involvement in reviewing the science sections of the report.

The year saw the completion of the Cape Roberts Project. This has been an exciting initiative – both scientifically and logistically. The information gleaned from the core samples added considerably to our knowledge of Antarctica and indeed global climate history. The final project report will also provide a useful reference manual for future multinational projects.

The level of interest in Antarctic scientific opportunities has remained high, with six new proposals accepted for inclusion in the 2001/2002 science programme. It is also pleasing to see the development of two new major projects with national and international potential. Antarctica New Zealand hosted a workshop in August on the proposed Latitudinal Gradient Project, part of a worldwide study to build our knowledge of latitudinal variations in ecosystems, and the Institute of Geological and Nuclear Sciences and Victoria University are taking a lead role in progressing the ANDRILL project with Germany, Italy, the USA and the UK. This project is being planned to carry on from the Cape Roberts programme and previous exploration of the undersea sedimentary layers. Whilst Antarctica New Zealand is supportive of these new projects as valuable opportunities for New Zealand science, there are logistics and resourcing challenges which the Board will consider in the coming year.

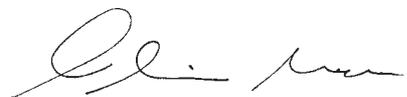
Another pleasing development in recent years has been the increased New Zealand involvement in Southern Ocean work including a new project to develop a biodiversity inventory for the Ross Sea marine ecosystem funded by the Ministry of Fisheries.

Recognition of our artists programme is growing as the work of our art fellows is exhibited, and we are receiving an increasing number of high quality proposals.

Development and maintenance work at Scott Base has made solid progress this year. The Board's decision to install a sewage treatment plant comes after an extensive period of assessing treatment options, and demonstrates our commitment to best practice environmental management procedures. This project will begin in the coming year and is due for completion in 2003. Meanwhile further refurbishment of the Scott Base accommodation and ablutions facilities is also underway to meet acceptable occupational health and safety standards.

The opportunity for Antarctica New Zealand to showcase Antarctic research, and to demonstrate the efficiency with which we run New Zealand's Antarctic operation, to Foreign Affairs Minister Phil Goff, Science Minister Pete Hodgson, Environment Minister Marion Hobbs and Associate Foreign Affairs Minister Matt Robson, was another highlight. We also appreciated the opportunity to present and discuss our analysis of New Zealand's Antarctic priorities with the Cabinet Ministers.

The year has been one of staff consolidation for Antarctica New Zealand, while there have been changes around the Board table. Having completed their terms of appointment, we farewelled Dr Clive Howard-Williams and Sue Suckling, founding members of the Antarctica New Zealand Board, who, during their terms, made outstanding contributions to the establishment of an effective and viable institute. We welcomed two new members, Dr Maj de Poorter from Auckland University and Dr Wendy Lawson from Canterbury University.





The year in review has seen a continued commitment by the staff of Antarctica New Zealand in delivering on our mission of: "Advancing knowledge, appreciation and conservation of Antarctica, for the benefit of New Zealand and the world community, through leadership, partnership and involvement in high quality Antarctic related activities."

We have a team at Antarctica New Zealand committed to continued improvement in the way we support New Zealand's interests in relation to the Antarctic region, who provide leadership of New Zealand's Antarctic and Southern Ocean activities with team spirit, excitement, passion and enjoyment of the challenges we face.

We have initiated reviews of a number of our internal processes this year, in order to more effectively support our stakeholders. These have included reviews of Scott Base staff training, medical assessment procedures, performance development and review systems, preventative maintenance and information management systems.

A review of our strategic priorities and resource needs for future years, which was presented as a briefing to the Ministerial visit to Scott Base has provided a basis from which to develop a three to five year plan. This will be completed in the coming year. Whilst we received a small increase in our baseline funding in the 2000 Budget, a review of the priorities and level of resourcing of New Zealand's future involvement in the region is still needed. Importantly, and in spite of significant increases in some of our operating costs, we operated within our budget with an excellent financial performance overall.

As in the past, the majority of our resources were committed to supporting New Zealand Antarctic science. We supported 30 science events from 13 New Zealand research institutions (CRIs and universities). With the completion of the Cape Roberts Project, the number of science personnel visiting Scott Base decreased on the previous year, however we supported more science than prior to the Cape Roberts Project. It is a credit to our operations team that we have been able to support this large multinational project without a decrease in other science activity.

We were very pleased to see the NIWA research ship, the Tangaroa contracted by Land Information New Zealand to carry out hydrographic survey work in the northern Ross Sea area. This also provided an opportunity for some preliminary survey work in association with the Ministry of Fisheries project on Marine Biodiversity of the Ross Sea. We are working closely with Ministry of Fisheries on the planning for this project, which developed from an Antarctica New Zealand workshop on Southern Ocean research.

Scientists from several CRIs and universities have proposed two new multinational projects for significant New Zealand involvement. The Latitudinal Gradient Project, proposed as a co-operative project with Italy and the USA, will provide a focus for co-ordinating research to enhance our understanding of the coastal and marine ecosystems of the Ross Sea Region and their likely response to climate change. ANDRILL, a co-

operative project with Germany, Italy, UK and USA follows from the Cape Roberts Project, and will further enhance understanding of previous climate impacts on Antarctica, and hence our ability to predict present and future climate change effects. We are working alongside the science community to consider how Antarctica New Zealand will support these projects.

Whilst our education programme requires a much lower level of resourcing than the science activities we support, it is also an area we take very seriously. Achieving our mission of advancing knowledge, appreciation and conservation of Antarctica requires public support. We address this through a formal education programme, and through our Artists to Antarctica programme. The latter has created increasing interest and presents a different and exciting perspective on New Zealand's connections with the Antarctic and Southern Ocean environment. We received an excellent range of proposals for the programme this year, which we are proud to support with assistance from Creative New Zealand.

Environmental stewardship remains a key priority area. In the day to day environmental management of our activities in Antarctica we must ensure that our own operations and the events we support meet the requirements of the Antarctic Environmental Protocol. We are also involved in regional and international initiatives to improve Antarctic environmental stewardship. The Ross Sea Region State of the Environment Report has been a major project this year.

The report will be published in November. Other priorities include working with the USA and Italy on Protected Areas and Specially Managed Areas in the region, and our ongoing involvement in New Zealand work for the Antarctic Treaty Consultative Meetings (ATCM) and the Committee on Environmental Protection (CEP).

We have again been actively involved in the Antarctic Managers Council (COMNAP) and the Antarctic Environmental Officers Network (AEON). I have chaired COMNAP for the fourth year, and our Environmental Manager, Emma Waterhouse has been the convenor of AEON since its establishment in 1996. We will both step down from these roles later in 2001, but will continue an involvement in the executive committees for both groups.

Our operations and corporate support teams again demonstrated their commitment to their tasks and ran a most successful season. It is a credit to the professionalism of the logistics team and Scott Base staff, that we continue to operate with a minimum of safety or environmental



incidents. The RNZAF continued to provide intercontinental flights with their C130 Hercules fleet. Their preparedness to take a flexible approach enabled us to help out the Italian Antarctic Programme with some RNZAF flights landing at the Italian Station at Terra Nova Bay. The RNZAF also carried out a medivac mission to McMurdo in April to recover US station personnel with medical problems unable to be treated in Antarctica - a good example of the international co-operation embodied in the Antarctic Treaty. Helicopters New Zealand provided an excellent standard of helicopter support on the Ice.

Since the establishment of Antarctica New Zealand, we have upgraded facilities at Scott Base to meet current environmental and health and safety standards. This has continued in the current year with the decision to install a sewage treatment plant at Scott Base.

Private operators continue to express interest in developing opportunities in Antarctica particularly in the area of tourism. Antarctica New Zealand has worked with the Ministry of Foreign Affairs & Trade to examine existing protocols and procedures for tour operators, and further work will be done in this area in the coming year.

The coming year will see the start of several centennial celebrations highlighting the involvement of New Zealand and other nations in the Ross Sea region over the last 100 years. It will be a time for reminiscence while we continue to look to the potential achievements of the future.



Science

“The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.”

Albert Einstein, physicist and mathematician

Latitudinal Gradient Project

In August 2000 a workshop was hosted by Antarctica New Zealand to discuss the state of scientific knowledge of terrestrial, freshwater and marine ecosystems in Victoria Land and form a strategy and direction for a proposed Latitudinal Gradient Project as one focus for New Zealand’s Antarctic research programmes. Workshop participants included scientists representing the many disciplines encompassed by the project, logisticians and environmental specialists. From the workshop a report was written, which is intended to serve as a planning tool for scientists, logistics experts and administrators concerned with science funding and science directions in Antarctica and the Southern Ocean. The workshop report can be found on our WebSite at www.antarcticnz.govt.nz.

There was general agreement that a significant key issue to be addressed is the response (biochemical, molecular, genetic, physiological, organism, community or ecosystem level) to a changing environment. A way to approach this is through increasing our understanding of coastal marine, freshwater and terrestrial organisms and ecosystems, their controlling variables and sensitivity to environmental change along a north-south continuum. The Victoria Land Coast from Cape Adare at 72°S to the La Gorce Mountains at 86°S provides an excellent environment for such a continuum.

The workshop reached consensus on six general strategies for studying terrestrial and marine ecosystems along the coastal zone of Victoria Land:

- Establishment of a comprehensive collection of existing information (database) regarding environmental variation, paleo-environmental research and ecosystem understanding.
- Application of an interdisciplinary approach to ecosystem research, focusing on responses to variation in latitude.
- Application of a transect approach (i.e. perpendicular to the coast), at the different latitudinal locations along the coastal zone, in order to separate elevation (altitude and depth underwater) dependence from latitudinal variation.
- Application of remote sensing and long term monitoring to characterise the physical environment at selected transects in addition to process studies.
- Interaction with the McMurdo Dry Valleys Long Term Ecological Research programme for annual baseline comparisons and historical environmental information.
- Close international collaboration with any US and Italian initiatives on latitudinal variation and with the SCAR Programmes ‘Regional Sensitivity to Climate Change’ (RiSCC) and ‘Evolution in Antarctica’ (EVOLANTA).

The workshop and report have started the process of planning for the project. Subsequent workshops are intended on focused areas of the project. Antarctica New Zealand is co-ordinating a science plan with national and international partners.



The Victoria Land coast at Cape Adare one potential site for the Latitudinal Gradient Project.

ANDRILL

ANDRILL is a multinational initiative to improve understanding of Antarctica's role in Cenozoic global change through stratigraphic drilling of its marginal sedimentary basins. The nations currently involved in the planning stages of ANDRILL are New Zealand, USA, UK, Germany and Italy. An ANDRILL Steering Committee has been established with membership of Dr Fabio Florindo (Italy), Dr David Harwood (USA), Dr Tim Naish (New Zealand), Dr Ross Powell (USA) and Dr Gary Wilson (UK).

The goals for ANDRILL are:

- To help understand the relationship between the behaviour of the Antarctic cryospheric system (ice sheet, shelf, sea ice), including magnitude and frequency of its changes through time on decadal to million year time scales, and its interactions with atmospheric and ocean systems.
- To determine, through the correlation of near-ice margin and Southern Ocean stratigraphic records, the role of Antarctic ice sheets on long- and short-order Cenozoic global climate, particularly in driving deep ocean circulation in the modulation of oceanic thermohaline conveyor and in changes in global sea-level elevation.
- To integrate drill hole stratigraphic data for past glacial and climatic events with regional and continental dynamical ice sheet models and global circulation models so as to constrain the models and to allow the drill hole data to be extrapolated over wider areas.
- To document the evolution and timing of major Antarctic rift and tectonic systems and the stratigraphic development of associated sedimentary basins.

The 2001 Intergovernmental Panel on Climate Change (IPCC) report acknowledges a shortage of information on Antarctic ice sheet and sea ice dynamics and interactions with global systems. Increased understanding of past climate impacts and interaction will help predictions of likely future changes.

A three-day international workshop took place on 5–7 April in Oxford, UK. The aim of the meeting was to seek commitment from the interested parties on key scientific objectives, a series of drill sites required to achieve the science goals, a timeline for planning and implementation and a budget. ANDRILL is focused on a 7 to 8 year plan for work in the McMurdo Sound area. The drill sites are, New Harbour, Granite Harbour, Windless Bight, The Ross Ice Shelf, Black Island, and Southern McMurdo Sound.

On 12 and 13 June, ANDRILL New Zealand Science and Technical Workshops were held to announce the ANDRILL McMurdo portfolio, to give interested New Zealand scientists a chance to express interest and comment, to review the proposed science goals of ANDRILL and to formulate a practical strategy, and, to plan for New Zealand participation in ANDRILL. New Zealand scientists have shown interest in the Granite Harbour site, the Windless Bight site and the Black Island site.

The Granite Harbour site has been chosen to extract high-resolution multi-proxy records of environmental, glacial, biological and climatic change for the last 5–10,000 years since the ice retreated from the MacKays Sea Valley. With core sites in both



Granite Harbour is one proposed site for the ANDRILL project.

inner and outer basins, it should be possible to resolve records for glacier retreat history, sea-ice dynamics of the western McMurdo Sound and fluctuations in the Ross Sea Polynya. Proxy records of sea-ice variability and deep water production from sediment should elucidate Ross Sea modulation of the oceanic conveyor from Ross Ice Shelf super cooling of water masses and sea-ice induced brine production.

The Windless Bight site has been selected to derive high-resolution multi-proxy records of environmental, glacial, biological and climatic change for Pliocene and Pleistocene (5 million years ago). The primary goals are to better understand fluctuations in the Ross Ice Shelf and surrounding sea-ice on orbital and millennial scales. This will lead to better understanding of the production of deep water in the Ross embayment and through comparison with Southern Ocean sediment records the role of these dynamics on modulating the oceanic conveyor.

The Black Island site has been chosen to study the moraine sequences that bear pre-Oligocene (50–65 million years ago) sedimentary erratics, which reflect warm, pre-glacial conditions in Antarctica. The primary scientific objectives are to recover the Palaeogene preglacial-glacial transition from Eocene-Oligocene strata and an early unroofing history of the Transantarctic Mountains.

Biodiversity of the Ross Sea (BioRoss)

This programme was developed collaboratively by the Ministry of Fisheries, Antarctica New Zealand and the Ministry of Foreign Affairs and Trade, and was assessed through the Biodiversity Strategy initiative process. The importance of Antarctica and the Southern Ocean to New Zealand is widely acknowledged.

New Zealand is actively involved with and committed to the Antarctic Treaty system and governance of the Ross Dependency. New Zealand's Environmental Strategy for the Ross Sea region has identified that there is little knowledge concerning the marine environment in the region and this is creating significant management difficulties. The recent expansion of fishing into the area, and increased interest in ship-based tourism in the region has further heightened the need to understand human impacts on Ross Sea ecosystems.

The objectives are to develop a more complete inventory of the biodiversity present in selected marine communities in the Ross Sea region and to facilitate better state of the environment reporting. A high level of co-ordination between New Zealand government agencies and international research organisations with an interest in the Ross Sea will be necessary.

A review of current knowledge describing the biodiversity of the Ross Sea region is presently underway. This review will document existing published and unpublished information pertaining to the biodiversity of the Ross Sea region. The study will make recommendations on communities that could be the subject of directed research where knowledge gaps exist. Finally, this study will identify marine communities in the region that are under high pressure or likely to come under high pressure from human activities in the near future.

A research voyage is scheduled for January – March 2004. Before this voyage, opportunistic sampling will be pursued on research vessels in the Ross Sea region. Along with ship-based research, sea ice and off shore research will be done. Because of the high costs of research in the Ross Sea region and the international nature of the science that is done, every effort will be made to include international partnerships. Currently, there are collaborations with Australia, Italy, Japan and USA. These partnerships will be actively maintained in the future, with emphasis put on proposals, which have a high degree of international participation.

The Cape Roberts Project (what we have learnt)

The Cape Roberts Project finished coring during the summer of 1999/2000. Last season a small team completed a final clean-up of the site whilst core samples continued to be analysed and more information gained. The aim of the project was to core through the recent glacial sediments into layers deposited before Antarctica was covered with ice. The result of the three years of coring was almost continuous core recovered of a sedimentary succession 1500 m thick, which represents paleo-data from 34 to 17 million years ago.

The three cores provide a continuous and detailed sedimentary record for some intervals but with a number of significant time breaks for others due to erosion and non-deposition. The oldest Cenozoic sediments cored show that the Ross Sea coast of East Antarctica had a cool temperature climate with a low woodland vegetation from 34 to 25 million years ago. These imply coastal summer monthly temperatures of around 12°C. Nevertheless the oldest cores still include occasional boulders and striated stones that record glacial activity and ice-rafting at this time. The younger core representing the period from 25 to 17 million years ago, record a low-growing sparse tundra on the adjacent mountains, along with periods in which the ice sheet margin reached offshore beyond the drill site. In this case coastal summer temperatures were significantly lower, around 5°C.

One significant outcome from studying the sediment characteristics is that the core shows cycles of advance and retreat of the ice margin. These coincide with falls and rises in sea level recognised from other core features, and presumed to be linked through changes in ice sheet volume. Over 50 of these cycles are recognised in the Cape Roberts core, though many more must be missing through erosion. Three of the thicker cycles deposited around 24 million years are of particular interest which show them to have been deposited within a time period of no more than 400,000 years and most likely within 120,000 years. Although the most recent ice ages are characterised by a 100,000 year cyclicity, the deep-sea record suggests that those prior to 800,000 years ago are characterised by 40,000 year cyclicity. The Cape Roberts record is the first physical confirmation of cyclicity on these time scales for ancient ice sheets, indicating that the Antarctic ice sheet in the distant past was being modulated at Milankovitch frequencies like the more recent Northern Hemisphere ice sheets.

Science Accomplishments and Plans

Antarctica as a Global Barometer

The Intergovernmental Panel on Climate Change (IPCC) recently concluded that the best estimate for greenhouse-gas-induced global temperature rise by the end of this century lay in the range 1.5 to 6.0°C above the present. The planet last experienced temperatures like this (+4.0°C) approximately 35 million years ago when Antarctica developed a large and dynamic icecap. The Antarctic has been ice covered for the last 15 million years with large variations in the size of the ice sheet. The ice sheet as it exists today is separated into two sections, the West Antarctic Ice Sheet (WAIS) and the East Antarctic Ice Sheet (EAIS). New Zealand's focus is on the dynamics of the EAIS through the Cape Roberts Project as well as other research work.

Researchers from Victoria University of Wellington are looking back into the past to better understand the effects on Antarctica of warmer global temperatures. The Allan Hills project led by Professor Peter Barrett is studying ancient glacial deposits at Allan Hills in Southern Victoria Land. Deposits are found at high elevations throughout the Transantarctic Mountains (TAM). They are of considerable interest because they represent the last major expansion of the EAIS. Allan Hills occupies a low point in the TAM, making the site more susceptible to overriding by the EAIS during the minor volume fluctuations. The aim of this project is to show whether valley glacier or continental ice sheet created these deposits in a single event or several overriding events.

Another research group from Victoria University of Wellington, also led by Professor Barrett is reconstructing the Holocene climate history of South Victoria Land Coast. The analyses to date reflect the dynamic climatic system of Victoria Valley, which is created by the interacting influences of the Dry Valleys, the EAIS and the Ross Sea. The strong contrasts brought along by rocks, ice and the sea in this climatic system amplify subtle shifts in regional climate and significantly alter the local weather pattern. For this reason, a climate record of the Victoria Lower Glacier provides an ideal opportunity to study rapid, high frequency climatic variations.

The Southern Ocean

The Antarctic Circumpolar Current, the largest current system on earth, defines the Southern Ocean and thermally isolates Antarctica from the rest of the Earth. The Southern Ocean plays an important role in the evolution and maintenance of the Antarctic biota. While the existence of Antarctic sea ice has been known for several centuries it is only relatively recently that it has been studied in detail.

New Zealand is researching the annual growth and break-up of sea ice in the Ross Sea region through a consortium, led by Dr Tim Haskell from Industrial Research Limited, made up of four New Zealand Universities and international collaborators. This is of direct relevance to Southern Hemisphere climate and the fisheries of interest to New Zealand. The group is studying the intermediate-scale properties of faults in sea ice, which focuses on aspects of sea ice that disturb its homogeneity and ocean wave and sea ice linkages relevant to climate. In the later study the group is researching how sea ice is changed by waves.

To provide a basis for assessing effects of human activities on Ross Sea fish populations, a group led by Dr John MacDonald from Auckland University is studying density and variability of populations of a common bottom-dwelling fish, (*Trematomus bernacchii*). Standard fisheries formulae are used to estimate population sizes, and mobility is monitored by comparing recaptures within the grid. The study has completed its first year of research and will continue in the coming season.



(*Trematomus bernacchii*), a bottom dwelling fish found in the Ross Sea Region



Professor Allan Green investigating mosses at Granite Harbour.

Life in Extreme Environments

The Antarctic icecap (98% of the continent's area) supports limited ecosystems of algae and bacteria in communities near the surface where occasionally some melt may occur to provide films of liquid water between ice crystals. The ice-free areas (2% of the continent) show a diversity of systems all dependent on liquid water, which in turn is dependent on small climatic changes.

Several groups from Waikato University championed by Professor Allan Green have linked programmes designed to deliver information about terrestrial bio-diversity along the entire latitudinal range of the Ross Dependency in the ice free area. Traditional taxonomic techniques are combined with the newer methods of molecular genetics to obtain an understanding of species and populations. Two molecular techniques: DNA sequencing and microsatellite markers, are used to obtain information about the genetic structure of moss populations.

Researchers led by Dr Ian Hawes from NIWA are studying Antarctica's inland aquatic ecosystems in order to better understand how these sensitive systems respond to natural and anthropogenic change. Because of their dependence on melting of ice and snow these systems are particularly sensitive to climate change. What's more, being the foci of much inland biological activity and low points of catchments, they are likely to be influenced by increasing human activity in the Ross Sea. The programme centres on the microbial mat communities that dominate many of these ecosystems, in terms of biomass and activity, and their underlying sediments. It examines how key processes, particularly light and temperature regimes and duration of freezing, influence mat composition, trophic structure and diversity by comparative studies of sites along latitudinal gradients in both North and South polar regions.

Human Influences In/On Antarctica

Although the Antarctic atmosphere has a unique physical and chemical character, its nature can influence all latitudes. NIWA researchers are improving our understanding of the Antarctic atmosphere's role in global change and the consequences of its response to that change. This coordinated research effort focuses on three areas: the evolution of ozone depletion over the Antarctic, the effect of that depletion on New Zealand and the rest of the world, and the influence of the Antarctic region on greenhouse trace gases. The most dramatic effect of anthropogenic changes in the stratosphere is ozone depletion over Antarctica, which causes an increase in biologically-damaging radiation that may damage Antarctic ecosystems. Although ozone-destroying chlorine will soon begin to decline, ozone recovery may be delayed 1-2 decades due to climate change. Testing the agreement between observations in the Antarctic and predictions based on models will give early insight into the future of the ozone layer.

Controlled spill and laboratory studies of contaminants in temperate climates have indicated that petroleum products and organic solvents are electrically resistive and highly reflective for radar energy. A group from the University of Canterbury has used a ground penetrating radar system to test the geophysical response of contaminants in a cold climate, specifically in the area immediately surrounding Scott Base. The initial findings on the extent of contaminants are extremely promising and work will be continued this coming season in remote areas with known spills.

While the presence of organic pollutants has been documented in the Antarctic, the primary sources have not been conclusively identified. A likely source of organic contaminants to the Antarctic ecosystem is aircraft emissions. Aircraft engines emit organic-rich particulates due to incomplete fuel combustion and these particulates contain organic compounds (polycyclic aromatic hydrocarbons – PAHs) that have been shown to damage the health of fragile ecosystems. A group led by Dr David Shooter is sampling PAHs and studying their isotopic composition. The spatial distribution and ultimate fate of aircraft-derived organic contaminants have not been extensively studied before in this environment.

Connections between Antarctica and New Zealand

Antarctica has not always been an isolated continent. Antarctica was once connected to South America, Africa, Australia, New Zealand and India as part of the Gondwana supercontinent. During the Paleozoic era, both New Zealand and Antarctica lay on the active margin of the Gondwana continent. A group led by Professor Steve Weaver and Professor John Bradshaw from the University of Canterbury are researching this connection. The Cambrian rocks of the Takaka terrane in New Zealand and the Bowers terrane in N. Victoria Land (NVL) are very similar and both include a Middle Cambrian volcanic arc and Upper Cambrian conglomerates. Similarly the Buller terrane (NZ) and the Robertson Bay terrane (NVL) appear to be closely related. The researchers are using these similarities to find connections between New Zealand and Antarctica.

Research Projects Supported by Antarctica New Zealand in 2000/2001

Characterisation of Aircraft Particulates Around Ross Island	University of Auckland
Ecology of Antarctic Demersal Fishes	University of Auckland
Deciphering the Glacial History of Northern Victoria Land	University of Auckland
Evaluation of Deterioration of Historic Huts & Bio-Diversity of Terrestrial Microorganisms	University of Waikato
Biodiversity and Performance of Lichens and Mosses	University of Waikato
The Mating System of the Weddell Seal (<i>Leptonychotes Wedellii</i>)	University of Waikato
Genetics of Antarctic Mosses	University of Waikato
Biodiversity of Terrestrial Invertebrates	University of Waikato
Molecular Ecology of Antarctic Fauna	Massey University
Glacial History of East Antarctic Ice Sheet at Allan Hills	Victoria University of Wellington
Climate and Landscape History from Shallow Drilling in the Dry Valleys	Victoria University of Wellington
Holocene Climate History from Coastal Ice	Victoria University of Wellington
Paleozoic Terrane Correlation: New Zealand and Antarctica	University of Canterbury
Geophysical Response of Contaminants in Soil and Permafrost in the Vicinity of Scott Base	University of Canterbury
Dynamics and Ionisation in the Antarctic Middle Atmosphere	University of Canterbury
Cardiovascular and Respiratory Physiology of Antarctic Fish	University of Canterbury
Magmatism in the Transantarctic Mountains	University of Otago
Basal Ice and Substrate Deformation at Subfreezing Temperature	University of Otago
Mechanisms of Evolutionary Adaptation in Antarctic Fish	University of Otago
Monitoring Magnetosphere-Ionosphere Coupling and Space Weather at High Latitudes	University of Newcastle
Cold Expectations: The Impact of Prior Perceptions on Mood in Antarctica	Lincoln University
Hydrographic Cruise – <i>R S Tangaroa</i>	Joint - National Institute of Water and Atmospheric Research (NIWA) / Land Information New Zealand (LINZ)
Antarctic Aquatic Ecosystems	National Institute of Water and Atmospheric Research (NIWA)
Processes and Interactions in the Antarctic Atmospheric	National Institute of Water and Atmospheric Research (NIWA)
Atmospheric Air Sampling	National Institute of Water and Atmospheric Research (NIWA)
Climate Data Acquisition – Scott Base and Arrival Heights	National Institute of Water and Atmospheric Research (NIWA)
Seismological Observatory	Institute of Geological and Nuclear Sciences (IGNS)
Adelie Penguin Population Dynamics	Landcare Research New Zealand Ltd.
Impacts of Fuel Spills on Antarctic Soils	Landcare Research New Zealand Ltd.
The Break-up of Sea Ice	Industrial Research Ltd.

Environmental Stewardship

“We need focused and relevant information on ecosystem processes and responses to environmental change, including natural and human induced changes. We need ways to track any changes over time. We also need more regionally based and integrated ways to assess and monitor human impacts.”

From Address given to Antarctic Science Systems Workshop, Canterbury University. Emma Waterhouse.

Overall 2000/2001 was a very successful season for the environmental management of Antarctica New Zealand's operations. Assessments, remediation and monitoring were undertaken at key field sites, and auditing and monitoring was conducted at Scott Base with positive results. Progress has also been made on specially protected and managed areas in the Ross Sea region, and a state of the environment report for the whole region will soon be published.

Ross Sea Region State of the Environment Report

After three years of work by over 15 key authors and numerous other contributors, the Ross Sea Region State of the Environment Report is nearing completion with a launch date set for 12 November 2001. The report will be the first comprehensive state of the environment report written for any part of Antarctica or the Southern Ocean. It reports on the pressures that science, fishing, whaling and global influences such as climate change are placing on the region's environment. It details current management of these pressures and identifies outstanding issues.

The report also reviews the current condition of the region's environment, providing the first integrated assessment of the role humans have played in environmental changes in this important part of Antarctica.

A framework for the development and management of activities in the region emerges from the report that will provide valuable information to operators in the region as well as international Antarctic Treaty forums tasked with management of activities on and around the continent.

A challenge for managers, policy makers and scientists following publication of the report will be to determine the format and timeframe of future reporting on the state of the region's environment. Follow up reporting is essential to ensure the full value of this first report is realised.

Adelie penguins of Cape Hallett. The metal stake visible in the centre is typical of the debris found by the joint site assessment team.



Joint US/NZ Assessment Team Visit to Cape Hallett

In January 2001, a joint New Zealand/United States four person team flew by helicopter to the site of the former research station at Cape Hallett, approximately 600 km north of Scott Base on the Northern Victoria Land coast. The aims of the visit were to survey and make an inventory of the remaining structures and surface debris at the station site and nearby penguin colony, to assess any visible areas of contamination, analyse immediate threats to the penguin population and establish priorities for future work. Logistic aspects and potential environmental impacts of any clean up work were also considered while on-site, and the opportunity was taken to survey the nearby protected area and consider issues related to its ongoing management.

A joint United States and New Zealand research station operated at Cape Hallett from 1957 to 1973. Built during the International Geophysical Year (IGY), it was occupied year round until 1964 when the main scientific laboratory was destroyed by fire. The station was then used as a summer only research base through until 1973, when it was abandoned. While a large proportion of the original buildings and associated equipment was removed during the 1980s and 1990s, a number of structures including fuel tanks and debris remain at the site. No comprehensive assessment had been done at Cape Hallett since the substantial decommissioning work in the 1980s.

Both New Zealand and the United States Antarctic programmes recognise the need to consider environmental issues associated with sites of past activity as well as current operations.

The team included Environmental Manager Emma Waterhouse from Antarctica New Zealand, the head of the environmental section of Raytheon and an assistant, and a US penguin biologist.

The team concluded that although the buildings would be relatively easy to dismantle, the large fuel tank does present a problem. In addition, a concerning amount of debris was found scattered through the penguin colony including rusting metal, spikes, wire and nails.

However, probably the most significant and disturbing discovery was 12 meltwater ponds showing signs of possible contamination with petroleum residue. Adelie penguin chicks that entered the ponds were adversely effected. The source of the contamination is as yet unknown and results of samples taken from the ponds were inconclusive. As an interim measure, snow fencing was left at Cape Hallett by the USCG Icebreaker Polar Sea, ready for erecting early in the 2001/2002 season to prevent the birds accessing the ponds.

Work is continuing with the United States to develop a way forward, including a detailed remediation plan for Cape Hallett.



Members of a joint US-New Zealand site assessment team surveying debris at the disused research station site, Cape Hallett.

Environmental Performance

Environmental Management System

Every year Antarctica New Zealand provides procedures and guidelines for environmental aspects of all activities including environmental training of its staff and event personnel. All activities must be assessed by the Environmental Assessment and Review Panel (EARP) and approved by the Minister of Foreign Affairs and Trade. Annual checks are made by environmental staff to assess whether approvals are being complied with and if environmental procedures are being implemented and are effective. A performance report is provided to EARP and the Ministry at the end of each season.

Since 1999, this cycle of planning, implementation and monitoring has been formalised in an Environmental Management System (EMS) for Antarctica New Zealand's Christchurch and Antarctic operations, designed in accordance with the international standard for environmental management ISO 14001. The aim of the EMS is continuous improvement – the experience and information gathered each year is used to update and improve policies and procedures. In October 2000, the first annual audit of the EMS was conducted. An independent auditor assisted in the process and reported:

'In general, compliance with both the EMS Manual and the requirements of ISO14001: 1996 was of a high standard. The Manual is well written and apart from a few minor issues identified in the Report, would appear to meet all the requirements for an Environmental Management System as specified in the Standard.'

An auditor will visit Scott Base in the 2001/2002 season to specifically assess Scott Base activities. In response to the outcomes of this visit, Antarctica New Zealand will make a decision as to whether to seek official ISO 14001 accreditation.

The Institute is already the only national Antarctic programme to have advanced implementation of an EMS to this stage.

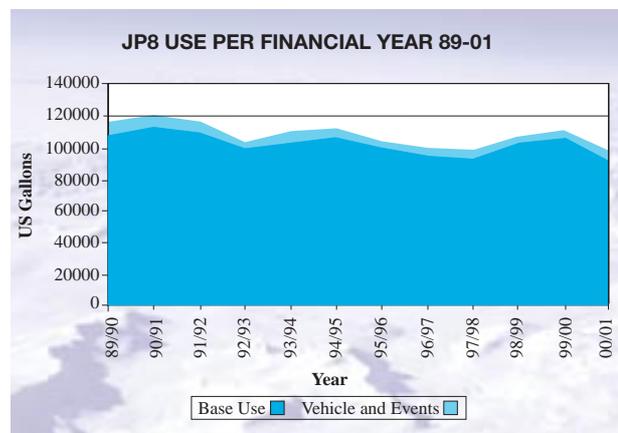
Environmental Monitoring Programme

Closely linked to the EMS is Antarctica New Zealand's environmental monitoring programme, which seeks to keep good records of New Zealand's Antarctic activities and make key measurements of their impact on the environment. Procedures for photographic monitoring around Scott Base, and weekly waste water quality monitoring were reviewed and revised during the 2000/2001 season to improve the consistency of the data collected. Sound water quality monitoring will be essential to verify the quality of the effluent from the sewage treatment plant to be installed in 2002 and to track any improvements in environmental quality off the shore at Scott Base. Monitoring in the areas of fuel handling, vehicle operations, contaminated sites, solid waste and protected areas also continued, and further developments to the programme suggested at the May 2000 monitoring workshop held in Christchurch are being investigated.

A key area of potential environmental impact for Antarctica New Zealand's operations is fuel handling and storage. Accordingly fuel spills have been a focus for improved record keeping. During 2000/2001, some 438 litres of fuel, oil and hydraulic fluid were accidentally released. This is one of the highest totals in recent years, but relates mostly to one significant spill, with five more minor spills. While this number of incidents is high, it probably reflects improved reporting rather than a significant increase in the frequency of spills. The response of personnel to fuel spills was also impressive, with a 75% average recovery rate of the spilt product being achieved. This is an example of the type of information which, collected annually, should contribute to both an understanding of our impacts on the environment, and an assessment of the effectiveness of current practices and performance.



Fuel drums being 'overpacked' into secondary containment at a field camp in Granite Harbour. Monitoring and improving fuel handling practices is a key focus of Antarctica New Zealand's Environmental Management System (EMS) and environmental monitoring programme.



Fuel used each year since 1989. This type of record keeping will help to assess environmental performance over time, in this case in the area of fuel efficiency.

Project Environmental Monitoring

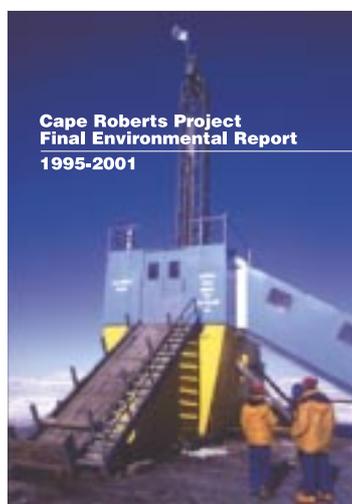
Cape Roberts Project Final Environmental Report

In accordance with the requirements of the Environmental Protocol, a Comprehensive Environmental Evaluation (CEE) was prepared for the Cape Roberts Project in January 1994, to assess the impacts of the project. The CEE requires that a comprehensive monitoring programme is carried out for the duration of the project.

A final environmental report for the project has now been completed which includes the results of compliance and environmental monitoring carried out from the commencement of project activities in 1995/1996 through to the decommissioning phase in 2000/2001. Monitoring will continue for at least two more years.

Throughout the Project, close liaison was maintained between environmental and operational staff, in particular the Project Manager. Regular communication allowed issues to be identified and resolved quickly, and solutions reached. Environmental management requirements were also integrated into the Operations Plan for the project and resources were allocated for addressing environmental issues including meeting the standards required in the CEE. In many cases higher environmental standards and practices were in fact achieved. A system of regular compliance and audit checks with systematic reporting was developed early on in the project's history that also allowed for independent review of activities. Independent review was recommended by the CEE and proved to be a useful tool for verifying the compliance and environmental monitoring results.

The results of the audits and monitoring programmes have confirmed that activities have been carried out in accordance with the CEE and that the actual impacts of activities associated with the project have resulted in only minor or transitory impacts on the environment.

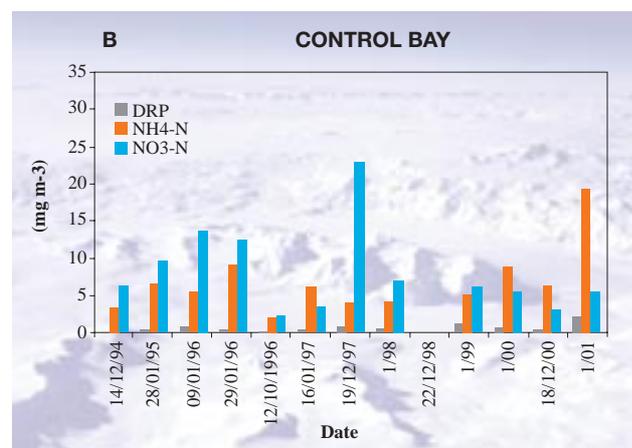
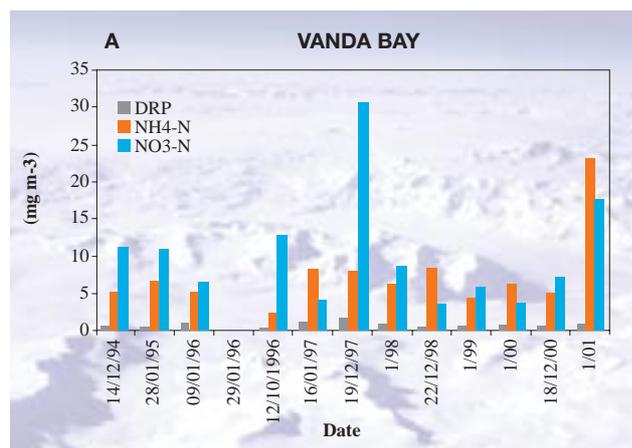


The cover of the Cape Roberts Project Final Environmental Report. The report outlines results from the environmental monitoring conducted throughout the five-year scientific drilling project.

Lake Vanda Monitoring

Six reports have now been produced that detail the results of monitoring carried out at the site of the former Vanda Station in the Wright Valley. The station was removed in 1994/1995 due to rising lake levels that threatened to flood the site. The latest monitoring report documents the changes to the aquatic environment in the vicinity of the decommissioned station. Natural inter-annual variations in nutrient levels and microbial biomass occur at all sites sampled including the control site. Variations are unrelated to the inundation of contaminated areas near the former station site and are not evidence of contamination.

The six years of data now provide a valuable baseline that will allow for an early indication of localised changes due to contamination, should lake waters rise.



Dissolved nutrients in (A) Vanda Bay and (B) Control Bay from December 1994 to January 2001. This long-running monitoring data set should provide a basis for rapid detection of any contamination of Lake Vanda from the old station site, should lake levels begin to rise again.

Environmental Highlights

Scott Base Sewage Treatment

Antarctica New Zealand will install a sewage treatment plant at Scott Base during the winter of 2002. The plant will be shipped to Scott Base in January 2002 and should be commissioned for the 2002/2003 summer. The decision to provide treatment for the sewage and wastewater discharge at Scott Base has followed an extensive process of monitoring and assessment of treatment options suitable for the Antarctic environment and fluctuations in population at Scott Base.

Faecal coliforms and biological oxygen demand (BOD) in the sewage outfall's receiving waters have been measured weekly since 1995 and have shown periods of very high contamination. In the 1998/1999 and 1999/2000 seasons further intensive studies involved repeating receiving water samples at different times in the tidal cycle and at different sites offshore through the sea ice, and conducting more detailed analysis of samples. Tidal currents and vertical stratifications around Scott Base, about which very little had been known previously, were also measured.

The results pointed to weak and variable currents offering little dispersion and transport of sewage away from the outfall. An effluent plume was identified extending more than 150m along the shore and 40m offshore. These conditions are not consistent with the approach to human waste disposal contained in the Environmental Protocol and, given other research suggesting that human-introduced bacteria, viruses or DNA could be taken up by local biota, were seen to present an unacceptable risk to the environment.

An Initial Environmental Evaluation (IEE) was completed by Antarctica New Zealand to assess the impacts of the installation and operation of the proposed treatment plant. The IEE considered a broad range of alternatives, including electrolytic and chemical treatment and composting, and indicated a biological treatment system (using bacteria on fixed or moving media to break down the effluent) as the preferred option.

The IEE concluded that:

'The activities were likely to have no more than a minor or transitory impact on the environment and will in fact significantly minimise the environmental effects on the receiving environment as compared to current practice.'

Weekly monitoring will be continued to verify water quality impacts once the plant is installed.

McMurdo Dry Valley ASMA Steering Group Established

Antarctica New Zealand and the US National Science Foundation have set up a steering group to lead the development of an Antarctic Specially Managed Area (ASMA) proposal for the McMurdo Dry Valleys. An initial meeting of the steering group and other experts is planned for August 2001 and will be attended by Emma Waterhouse, Environmental Manager. The aim of establishing ASMAs is to enhance planning and coordination of activities, avoid possible conflicts between activities, improve cooperation between operators, and minimise environmental impacts of activities. The outcomes of two previous workshops focused on the impacts of activities in the valleys, hosted by NSF in 1995 and 1999, should provide a valuable starting point for the work.

Cape Roberts Clean-up

The 2000/2001 summer was the fifth and final season of the Cape Roberts Scientific Drilling Project, and logistically was devoted entirely to site remediation. During October and November all project equipment was towed by bulldozer over sea-ice from the Cape Roberts storage site to Scott Base (150km away) in 44 sledge loads weighing over 300 tonnes. The team returned to the site for a further two weeks in January, collecting rubbish, conducting maintenance on the two remaining huts, removing the communications repeater and associated wires, and raking compacted earth in the storage area to accelerate restoration of the soil structure.

Environmental staff visited the Cape during both phases of the clean-up and continued the auditing and monitoring which has been an ongoing part of the project. Analysis of soil and water samples did not identify any hydrocarbon contamination, and visual disturbance plot assessments were similar to previous years. All activities conducted were found to be in accordance with the project's Comprehensive Environmental Evaluation.

Much of the rubbish collected by the team pre-dated the present activities, so the project has not only had no significant or lasting impacts on Cape Roberts, but has actually improved some aspects of the environment. The five-year series of monitoring information now collected, and other information and experience generated during the project, has improved the state of knowledge about the area and provided a good model for the environmental management of future large-scale projects of this nature.



The Cape Roberts Project Manager and Camp Assistant raking compacted soil during the site remediation phase of the project, January 2001. Little sign is left at Cape Roberts of the five year, seven nation scientific drilling project.

Revised Management Plan for New College Valley, Cape Bird

New Zealand is currently responsible for 14 different protected areas within the Ross Sea region. Over time, the management plans for these areas are being upgraded to the format prescribed in Annex V of the Environmental Protocol. Following this initial review, the plans are then revised at least every five years.

An area of rich moss and associated microflora and fauna at Cape Bird, Ross Island has been designated as a Site of Special Scientific Interest (SSSI No. 10) since 1985. The original designation also included a Specially Protected Area (SPA 20) within it, with more stringent controls. A revised management plan for both these areas was accepted at the Special Antarctic Treaty Consultative Meeting in The Hague in September 2000. The plan is the result of consultation with relevant scientists and operational staff, improved mapping of the area, and a better understanding of potential impacts of activities such as helicopter operations. The management plan now meets Annex V requirements.

The whole area has been renamed New College Valley SPA 20, and a Restricted Zone continues to set aside the previous SPA area as a reference site. The outer boundaries of the SPA have been revised to better reflect the topography of the area, and improved maps and perspective views (showing preferred helicopter approaches) have been produced to assist visitors.

Public Awareness & Education

"I feel very honoured to have been given an opportunity to experience something so rare. It was an unforgettable week."

Nicole Eaton, 7th Form Student Burnside High School, Christchurch



Burnside Students: Sam Smith, Nicole Eaton, Alice McCubbin and Nigel Spence, completing a living history project at Scott Base.

Artists to Antarctica

The Artists to Antarctica programme has grown in public profile through the ongoing publication and presentation of work by current and former Antarctic Arts Fellows. It is a partnership between Antarctica New Zealand and Creative New Zealand and is considered to be a leading example of art residencies in New Zealand.

This season, dance choreographer Bronwyn Judge from Oamaru and ceramicist Raewyn Atkinson from Wellington spent a week in Antarctica. Two of Raewyn Atkinson's first impression works were accepted for the inaugural Portage Exhibition in Auckland and she is presently working on a more complex exhibition which will open in Wellington early in 2002. Bronwyn Judge will present a dance series at the Dunedin Art Gallery in November 2001 and she will premier her dance theatre in Dunedin in March 2002. Craig Potton, a Nelson photographer made a return visit to Antarctica to complete a series of photographs for a book being compiled in collaboration with a US author Bill Green.

Auckland sculptor Virginia King opened her national touring installation 'Antarctic Heart' which incorporates music composed by fellow Antarctic Artist Chris Cree Brown. A representation of Virginia King's work has been selected as part of an international exhibition at the US Science Hall in New York later this year.

New Zealand mainstream and specialist media have continued to profile artists who have been to Antarctica including individual interviews for print and radio, and television for documentaries. This, together with Antarctica New Zealand's annual promotional campaign resulted in the highest number of applications being received to date, for the 2001/2002 season.

The programme, and its artists, gained further recognition through the production of a series of art cards generously supported by Auckland arts patron Jenny Gibbs following her visit to Antarctica in January.

Three Arts Fellows have been selected as next season's recipients – Denise Copland, printmaker from Christchurch, Anne Noble, photographer from Wellington and Richard Thompson, painter from Auckland.

Facilitation of Antarctic Education

Staff from Auckland Museum, The Antarctic Visitors Centre, Canterbury Museum and Southland Museum travelled to Antarctica this season under the Education Initiatives in Antarctica Programme. After a familiarisation visit around Scott Base, the representatives returned to New Zealand to complete Antarctic based education projects. The results of this visit included multiple talks to several thousand students at both primary and secondary level in Auckland, Canterbury and Southland. Auckland Museum featured Antarctica and the research work supported by Antarctica New Zealand in three issues of its education publication. Two teaching resource kits and the start up development of an interactive virtual reality CD Rom and WebSite giving a tour of Scott Base and surrounds were also developed.

Thirty-six education applications for the 2001/2002 season were received and eight proposals were accepted. These include proposals from Tauranga Girls College, Otago Museum, Lincoln College, Christchurch College of Education, Wellington College of Education and Otago University.

Burnside High School

An innovative proposal by the Burnside High School History Department to the Antarctica New Zealand Education Initiatives in Antarctica Programme, resulted in four senior students and a teacher travelling to Antarctica in January. Their project was to study the first hut built by New Zealand in Antarctica and to write a report giving recommendations as to its future. To do this they utilised an in-depth study of the Trans-Antarctic Expedition and International Geophysical Year of 1957 that they had completed prior to visiting Antarctica, as well as interviewing Scott Base staff and event personnel, and visiting historic huts at Cape Royds and Hut Point to use as comparisons. Their report was presented to Antarctica New Zealand and to the TAE/IGY Hut Project Team for consideration. Exciting ideas for displaying artefacts were presented including using the kitchen to display a chronology of food used at Scott Base. On return to New Zealand the students talked to a number of schools in the Canterbury area.

Graduate Certificate in Antarctic Studies

The third Graduate Certificate in Antarctica studies course was run over the summer by the University of Canterbury's Antarctic Studies Faculty, Gateway Antarctica. The Antarctic field component was held at Hutton Cliffs, Antarctica from 14 to 28 December. Antarctica New Zealand played an active role in the advisory panel and board of Gateway Antarctica, contributed specialist input into the development of the course schedule, provided lectures and research information as well as managing the operational support for the Antarctic component. Course requirements include the completing of a substantial personal project. Project topics included

- Developing useful environmental indicators to assess tourism impacts in the Ross Sea Region: A recommended approach
- Endocrine disrupting compounds in the Antarctic: How man-made chemicals could put the continent's future at risk
- Waste management in Antarctica: the impact of sewage disposal and available treatment options for Scott Base
- Recreational activities during the Antarctic Heroic Era
- Navigational instruments and methods for the Amundsen and Scott expeditions to the South Pole
- Music from the Ice.

Media Initiatives

The Media Initiatives programme was successfully continued this year with reporters from Radio New Zealand and Wellington's Evening Post going to Antarctica accompanied by a freelance journalist and a writer from New Zealand Defence. The resultant articles, documentaries and interviews provided opportunities for New Zealand supported research to be profiled through different media. A two-person documentary team from the BBC produced two programmes for children's science television in the UK.

Special Activities

Auckland Art Function

Antarctica New Zealand hosted a function for Auckland Arts patrons in March 2001 to showcase work by current and former Antarctic Arts Fellows. Bill Manhire, Nigel Brown, Virginia King and Raewyn Atkinson exhibited work and talked about their Antarctic experiences.

TAE-IGY Hut

Antarctica New Zealand established a project team to develop a management plan for the TAE/IGY Hut formerly known as 'A' Hut at Scott Base. The team which included external experts and key stakeholders proposed that the hut become an historic monument under the Antarctic Treaty to provide long term protection. A motion to this effect was prepared for the Antarctic Treaty Consultative Meeting in St Petersburg in July 2001. The detailed management plan is due for completion in October 2001 and will include long term plans for the maintenance and development of the hut as a living part of Scott Base.

Erebus Memorial Archive

To mark the commemoration of the 20th anniversary of Flight TE901, Antarctica New Zealand created a memorial volume, a copy of which was taken to Scott Base at the beginning of the season. The original volume was deposited with National Archives in Christchurch who arranged for the bound volume to be sent to National Archive offices in Auckland, Wellington and Dunedin where relatives of the passengers who died in the accident were able to read the book. It is the first time that an archive has been circulated to different areas of New Zealand and the concept was well supported by National Archives. Relatives were advised of the circulation dates through local media and Antarctica New Zealand received many messages of thanks for undertaking this project. A moratorium on access has been placed on both volumes with only immediate families able to access them for 50 years.

U3A

The University of the Third Age is an organisation representing retired professional and academic people. The Christchurch branch invited Antarctica New Zealand to present a series of four lectures about New Zealand's involvement in Antarctica, current issues with Antarctica and some of our key initiatives. Antarctica New Zealand staff spoke on topics including environmental monitoring, the Cape Roberts project, the Artists to Antarctica programme, education initiatives and science projects.

Information Provision

Information Management System Review

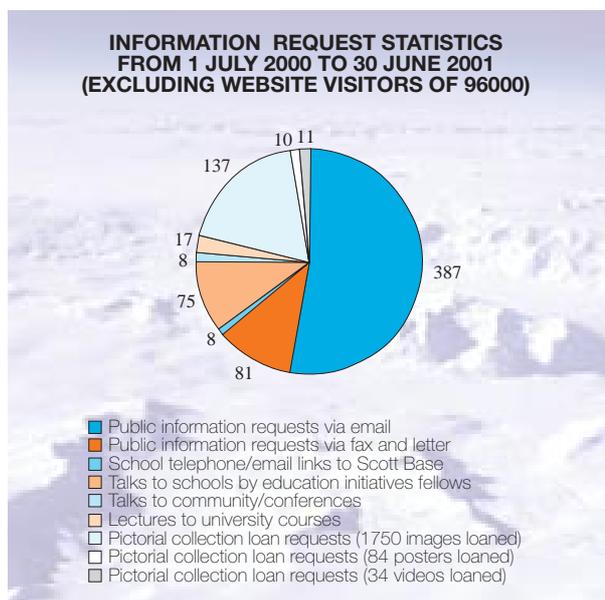
An Information Management Systems (IMS) Team was established to review Antarctica New Zealand's information needs, management tools and information flows and requirements.

After an in-depth review and investigation the team identified six core information need areas and developed an Information Management Systems Strategy to guide Antarctica New Zealand in policy, procedure and systems implementation. Further work will be done to identify where computer based systems are required to support the core needs, and using the IMS Strategy a phased procurement and integration process will be initiated.

Antarctica New Zealand WebSite

Antarctica New Zealand's WebSite has received positive feedback from web users. The site is now composed of 318 pages with 265 images. As well as its public awareness and education functions it is now being utilised to provide our season event personnel with required information on Antarctic operational support, environmental permit and control requirements and science support documentation.

Future design improvements are planned including a user survey form and site search engine. In the first year of operation the revised site has had 172,554 visitors.



Antarctica New Zealand is an information hub for Antarctic inquiries from the public, specialist groups and schools throughout New Zealand and around the world.

Council of Managers of National Antarctic Programmes (COMNAP) activities

Antarctica New Zealand has played an active role in a number of COMNAP initiatives during the year, with a fourth year of the CEO chairing COMNAP, and our Environmental Manager, Emma Waterhouse chairing the Antarctic Environmental Officers Network (AEON).

The annual COMNAP meeting was held in conjunction with the Scientific Committee on Antarctic Research (SCAR) meetings in Tokyo in July 2000 – hosted by the Japanese Polar Research Institute. The meeting was attended by 29 countries and included an Antarctic logistics symposium, a risk assessment workshop and a joint workshop with SCAR on international scientific and logistics co-operation. It also included working group meetings which encourage exchange of information and ideas in relation to ship operations, air operations, energy management, emergency response and contingency planning, interaction between national programme operators and the tourist industry, environmental management, and training.

Specific examples include the development of airlinks from South Africa and Australia to the Antarctic continent, and the development of a ship positioning system. The activities of COMNAP and information on national programme operations in Antarctica are presented on the COMNAP WebSite - www.comnap.aq.

COMNAP also provides advice to the Antarctic Treaty Consultative Meetings (ATCM). This year we developed advice on environmental emergencies and response action for the discussions on an Annex to the Antarctic Environmental Protocol on liability for environmental damage. A paper was also presented to the Special ATCM in the Hague in September 2000 on a handbook of environmental techniques and consideration of environmental impact assessment approaches by the Antarctic Environmental Officers Network (AEON).

AEON is a network of environmental officers in national Antarctic programmes. The network was set up in 1996 under the chairmanship of Antarctica New Zealand's Environmental Manager. It has since developed the handbook of environmental monitoring techniques, and provided advice to COMNAP on a range of environmental issues. The network is now working on guidelines for the development of Antarctic station monitoring programmes, and an analysis of initial environmental impact assessment statements for presentation to the next Committee on Environmental Protection (CEP) meeting.

COMNAP and SCAR have jointly supported the development of a meta directory of Antarctica data sets – the Antarctic Master Directory (AMD). It was decided this year to accept an offer to incorporate the AMD into NASA's Global Change Master Directory. The Directory aims to provide information to Antarctic scientists on access to Antarctic data sets.



“It is in the interests of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord.”

Preamble to the Antarctic Treaty

Antarctic Treaty Consultative Meetings

Antarctica New Zealand contributes expert advice to the New Zealand ATCM and CEP delegations. Over the past year this has included the presentation to the CEP of inter-essional work to develop guidelines for Antarctic Protected Area management plans that involved 22 countries that was lead by the Antarctica New Zealand environmental manager. The guidelines were accepted by the CEP and the ATCM.

International collaboration

Antarctica New Zealand encourages New Zealand involvement in international scientific collaboration. This year saw the final cleanup for the Cape Roberts Project. This project, managed by New Zealand, has been the highly successful outcome of scientific and logistics cooperation between seven countries to investigate the history of the climate and tectonics of McMurdo Sound.

We are now working with the science community in New Zealand and other interested countries (presently the USA, Italy, Germany and the UK) on the development of further paleoclimate drilling work; and with the USA and Italy on co-ordination of research to better understand ecosystems and potential climate change impacts over the latitudinal range of the Ross Sea region.

There has also been continuing international involvement in a range of other NZ science projects – 47% of the 2000/2001 science projects supported by the Institute involved scientists from other countries.

The operation of a joint flight pool between Christchurch and Antarctica with the United States and Italian Antarctic programmes is an important aspect of our logistics, enabling significant economies of scale. New Zealand was able to provide several landings at the Italian base at Terra Nova Bay this year to help the Italian programme through some technical problems with their inter-continental fixed wing support. We were later provided with Twin Otter support for New Zealand field parties by the Italian programme. The RNZAF also provided a medivac flight in April 2001 to evacuate critically ill personnel from McMurdo Station.

Operations

“Flexibility is the key to our success in Antarctica. It is the resourcefulness, adaptability and sheer hard work of our team on the ice that allows us to meet the challenges of the operating environment and get the job done safely and efficiently.”

Julian Tangaere

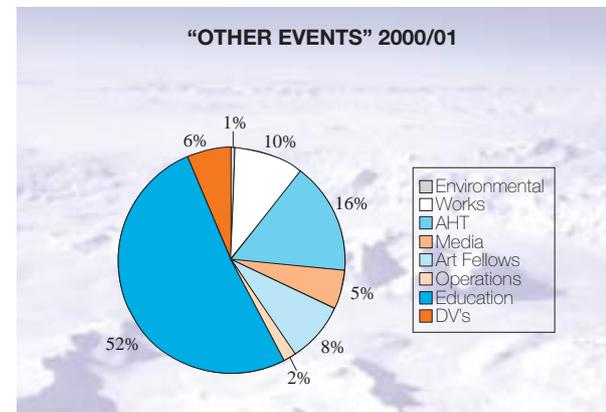
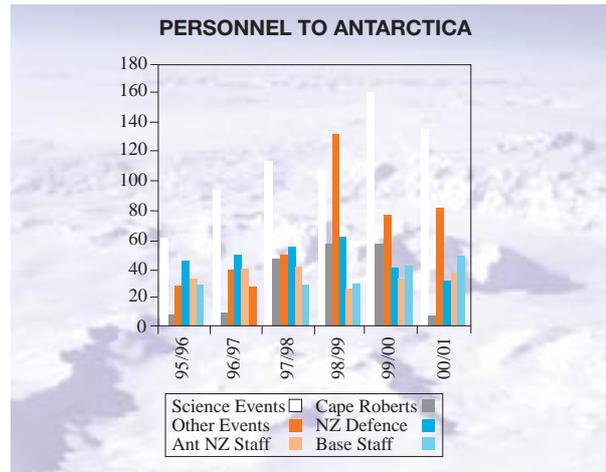
The Operations Group within Antarctica New Zealand expanded this year to include Corporate Services, thereby providing support to external clients through the Antarctic Support staff, and internal provision of human resource services, financial management, and information technology.

The restructured group has begun a review of a number of internal processes aimed at improving the effectiveness and efficiency of the support delivered. These include computerised maintenance management, financial and inventory systems, risk management processes, and project management.

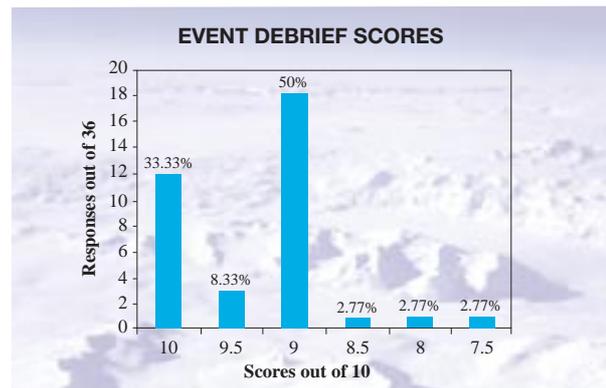
Field Season

The 2000/2001 Antarctic season saw the culmination of the Cape Roberts Project. After three very successful drilling seasons the principle tasks were to return the project equipment to Scott Base, and to environmentally remediate Cape Roberts in accordance with the Comprehensive Environmental Evaluation. Both tasks were successfully completed and the end of the project represents a significant achievement for Antarctica New Zealand as project manager.

The completion of the Cape Roberts Project, and the late cancellation of two events saw a decline in the number of scientific personnel and person days in Antarctica, compared with the 1999/2000 season. Overall, the total number of personnel to Antarctica declined, but the changing nature of field events provided some fresh challenges. For the first time since the 1996/1997 season, science parties were supported in ‘deep field’ locations in Victoria Land, up to 1000km from Scott Base. Field parties also worked at Cape Adare and Cape Hallett. Supporting remote activities was achieved through close cooperation with the United States and Italian programmes.



This table is a further breakdown of non-science events for the season



An excellent safety and environmental compliance record was achieved, with no significant injuries to personnel, or damage to the environment as assessed under the Environmental Management System



The new sewer outfall at Scott Base.

The joint logistics pool with the United States and Italian Antarctic Programmes, continues to function well for both intercontinental logistics between Christchurch and Ross Island and for on-continent flight support.

New Zealand contributed the following major resources:

- 15 RNZAF C130 Hercules flights
- 239 helicopter hours
- 141,515 lbs of air freight
- 215,845 lbs of sea freight.

Facilities Development

Antarctica New Zealand continues to invest in the infrastructure at Scott Base, to improve living and working conditions, safety, and environmental compliance. Significant projects included:

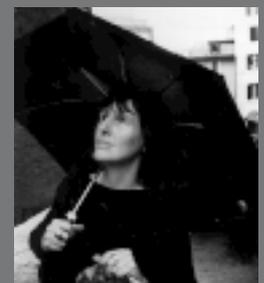
- Refurbishment of Stage 3 ablutions.
- Replacement of deteriorated sewer lines, and construction of a new sewer outfall to meet Environmental Protocol requirements.
- Planning and design of a new sewage treatment plant.
- Design and purchase of overcladding to strengthen Stage 3A shell, and to improve insulation.
- New handheld VHF radios for field work.
- Refurbishment of two major mobile plant vehicles, and purchase of a new four wheel drive vehicle.
- Ongoing improvements to fire protection systems and fuel storage enhance safety, and a comprehensive repair and maintenance programme protects the organisation's asset base.

Service Performance

All events supported in Antarctica are invited to rate the quality of service delivery received. Feedback is invited on aspects such as field training, field communications, food, laboratory facilities and transport amongst others. Overall, service is then graded on a scale of ten. The table (see left) indicates that the level of satisfaction with service delivery remains high.



Margaret Elliot



Organisations represented in Antarctica New Zealand's 2000/2001 Antarctic events

NEW ZEALAND ORGANISATIONS SUPPORTED IN ANTARCTICA

Antarctic Heritage Trust
Antarctic Visitors Centre
Armed Forces Canteen Council
Auckland Museum
Burnside High School
Canterbury Museum
Cawthron Institute
ConnecTel Ltd
Craig Potton Publishing
Geochemical Solutions
Helicopters New Zealand
Industrial Research Ltd (IRL)
Institute of Geological and Nuclear Sciences (IGNS)
Kelly Tarlton's Underwater World and Antarctic Encounter
Land Information New Zealand (LINZ)
Landcare Research New Zealand Ltd
Lincoln University
Massey University
Ministry of Fisheries
Ministry of Foreign Affairs & Trade
National Institute of Water and Atmospheric (NIWA)
New Zealand Defence Force – Army, Navy, 40 Squadron of RNZAF
New Zealand Fire Service
New Zealand Tourism Board
Radio New Zealand
Southland Museum
Telecom Ltd
The Evening Post
University of Auckland
University of Canterbury
University of Otago
University of Waikato
Victoria University of Wellington

INTERNATIONAL COLLABORATIONS

ANSTO – Australia
British Antarctic Survey – UK
Complutense University – Spain
Free University of Brussels – Belgium
Italian Antarctic Programme – Italy
United States Department of Agriculture – National Resource and Conservation Service (USDA – NRCS) – USA
University of Amsterdam – The Netherlands
University of Birmingham – UK
University of Kiel – Germany
University of Malay - Malaysia
University of Minnesota – USA
University of Newcastle – Australia
University of Queensland – Australia
University of Tasmania – Australia
University of Western Ontario – Canada

CHRISTCHURCH STAFF

Gillian Wratt, Chief Executive
Vivienne Allan, Communications and Marketing Manager
Catherine Coulter, Accountant (from August 2000)
Kevin Foyle, Finance Manager (until 7 July 2000)
Dean Peterson, Science Strategy Manager
Julian Tangaere, Operations Manager
Emma Waterhouse, Environmental Manager
Steve Andrews, Assistant Accountant (until 28 July 2000)
Patsy Bass, Executive Assistant (until March 2001)
Helen Boerlage, Purchasing Manager (until 14 July 2000)
Peter Brookman, Facilities Engineer
Natalie Cadenhead, Information Services Specialist
Pat Clarke, Seamstress (until August 2000)
Peter Cleary, Antarctic Support Co-ordinator (until April 2001)
Roza Cole, Seamstress (from March 2001)
Jim Cowie, Antarctic Support Co-ordinator (from May 2001)
Jim Cowie, Cape Roberts Project Manager (until April 2001)
Rebecca Gee, Environmental and Policy Officer
Erin Hird, Personnel/creditors Administrator (until July 2000)
Michelle Jones, Executive Assistant (from May 2001)
Mike Mahon, Science and IT Support
Michael Nottage, Inventory/Purchasing Controller
Teresa Orr, Receptionist (from Feb 2001)
Donna Palmer, Receptionist (Parental Leave from Feb 2001)
Kevin Rigarsford, Maintenance and Field Engineer (from August 2000)
Kelly Robins, Office Assistant (from August 2000)
Ron Rogers, Engineering Support Co-ordinator (until July 2000)
Shaun Smith, Movements Officer, clothing (from November 2000)
Robert Stewart, Movements Officer, cargo
Carl Stoneman, Movements Officer, clothing (until July 2000)
Prue Sullivan, Human Resources and Office Administrator (from July 2000)
Paul Woodgate, Movements Controller

SCOTT BASE WINTER STAFF

Doug Bell, Electrician
Dave Brice, Winter Manager, Field Support Officer
Nicki Fairbairn, Domestic
Mark Herrick, Mechanic
Jonathan Leitch, Base Engineer
Aaron Lock, Chef
Steve Plant, Base Engineer
Jamie Plowman, Science Technician
Anthony Powell, Telecom Tech
Phil Snelling, Carpenter

SUMMER STAFF

Dean Arthur, Field Training Instructor,
Herm Binnie, Science Technician
Jonathan Bostock, Communications Operator (NZDF),
Helen Brown, Domestic
Rachel Brown, Field Training Instructor
Steve Brown, Carpenter
Bruce Dobson, Plant Operator (NZDF)
Paul Drysdale, Scott Base Services Manager (NZDF)
Kevin Duignan, Carpenter
Michael Fitzgibbon, Communications Operator (NZDF)
Katy Graham, Communications Operator (NZDF)
Lana Hastie, Domestic
Adam Magnussen, Communications Operator (NZDF)
John McGregor, Base Engineer
Kevin Nicholas, Field Training Instructor
Louise Paton, Communications Operator (NZDF)
Jeff Reid, Chef
Paul Renshaw, Cargo Handler (NZDF)
Jim Spencer, Field Training Instructor
Jenna Stanish, Canteen Manager (AFCC)
Jonathon Watkins, Communications Operator (NZDF)

SPONSORSHIPS WERE RECEIVED FROM:

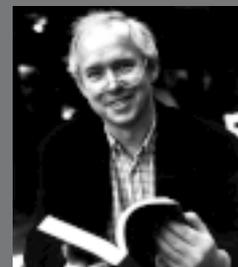
NZ Post
Kelly Tarlton's Underwater World and Antarctic Encounter
International Antarctic Centre
Visitor Centre

Statement of Objectives and Service Performance

year ended 30 June 2001



Bill Manhire



Statement of Objectives and Service Performance

Year ended 30 June 2001

Performance achieved against agreed measures, standards and costs for all outputs

Description

The development, management and execution of New Zealand activities in respect of Antarctica and the Southern Ocean, in particular the Ross Dependency, including:

- Planning, coordination, facilitation and logistic support for an international quality science programme based on a long-term strategic plan for New Zealand science in Antarctica, the Southern Ocean and the Ross Dependency.
- Environmental stewardship for New Zealand activities in the Ross Dependency, including State of the Environment reporting and management and monitoring of environmental impacts; and associated logistics support.
- Public awareness and education in relation to Antarctica and the Southern Ocean, including publications and events aimed at public awareness, encouragement of education in schools, and logistic support for associated visits to Antarctica.
- Encouragement of scholarship related to Antarctic and Southern Ocean issues.
- Advice on policy in relation to the Antarctic and the Southern Ocean, including the environmental impact of New Zealand activities, funding for Antarctic science, and policy issues being examined by the Antarctic Officials Committee.
- International representation in respect of scientific and other programme-level New Zealand activities in Antarctica and the Southern Ocean.

Quality, Quantity, Timeliness

Outputs will be delivered in accordance with the priorities and policy directions established by the Government.

Required outputs were delivered in accordance with priorities and policy directions established by the Government.

Outputs will be delivered by agreed target dates and as specified in the Purchase Agreement between the Minister and the New Zealand Antarctic Institute.

Outputs were delivered as detailed under each sub-output area.

Key stakeholder satisfaction with the timeliness and quality of Antarctica New Zealand activities and services.

Event debrief scores illustrate a high level of satisfaction with support for Antarctic activities, with 94% of scores of nine or above, out of 10.

Policy contributions and advice to MFAT and the Officials Antarctic Committee will:

- meet timelines set by MFAT and the OAC;
- be proactive, highlighting emerging issues where appropriate;
- include consideration of all relevant available information;
- include consideration of relevant scientific, technical and operational aspects;
- include relevant consideration of alternatives and associated costs, benefits and risks;

- incorporate appropriate consultation with affected parties; and
- maintain confidentiality of Government information, including documents, communications and other material, including information from Antarctic Treaty Consultative Meetings not otherwise public.

Policy contributions and advice have been provided to MFAT and the OAC in a timely manner to meet the quality criteria outlined in the Purchase Agreement.

Antarctica New Zealand takes a proactive approach to its policy advice role. In particular, in the 2000/01 year we have carried out an analysis of priorities and resourcing issues in relation to our representation of New Zealand interests in relation to Antarctica and the Southern Ocean. This was presented in a briefing paper to a Ministerial group that visited Scott Base in January 2001, and has formed the basis for discussion with MFAT on New Zealand's strategic directions in the region.

An effective presence in Antarctica through the safe, effective operation of Scott Base and support for field activities throughout the Ross Dependency.

Facilities and capabilities in the Ross Dependency will provide the capability to support up to 400 people over the summer season effectively and safely, to meet reasonable user requirements as measured in event debrief scores of seven or better.

Operation of Scott Base as a support facility for science and other approved activities, including provision of:

- a year-round resident New Zealand Government Representative
- an all terrain vehicle fleet
- fixed and rotary wing air support
- laboratories and other work areas
- telecommunication capabilities, including phone, data and radio
- accommodation capacity for 86 personnel, including catering, storage and ablution facilities
- management of the Scott Base asset on behalf of the Crown.

Logistics and supply support for approved New Zealand activities in the Ross Dependency and Southern Ocean, including provision of:

- 15 flights as a contribution to the joint logistics pool (airlift and sealift) between Christchurch and Ross Island operated pursuant to the existing Government to Government arrangement
- freight forwarding and warehouse facilities
- efficient movement of all cargo requirements, including hazardous materials in accordance with pertinent regulations
- accurate assessments of cargo dimensions and weight.

Field operating support in the Ross Dependency, including provision of:

- transport support both ground and air
- field food, clothing and camping equipment
- radio communications
- search and rescue support
- specialised training
- safe deployment and recovery of field events to required locations.

Facilities and capabilities were provided to support 296 people, with 36 event debriefs, one score of 7.5, one of 8.5, and the remainder were 9 out of 10 or higher. Government representation, facilities, logistics support and field capabilities were all provided

Quantitative Benchmarks	2000/01 estimated	2000/01 actual
Person days supported for science activities	4,400	3,541
Persons days supported for non-science activities	700	823
Expenditure	\$6,616,821	\$6,430,100

The Board of Antarctica New Zealand



This year, the Board of Antarctica New Zealand has visited several universities where Antarctic research is recognised as an important part of their annual programme. Victoria University played a major role in the Cape Roberts Project and has been involved in Antarctic research since the early 1960s.

Pictured during a Board meeting held at the University of Victoria (Wellington) are from left: Dr Bas Walker, Dr Ron Heath, Dr Maj de Poorter (seated) Chris Mace (Chairman of the Board), Dr Wendy Lawson (seated) and Bill Mansfield.

Output Delivery

1.1 PLANNING AND FACILITATION OF SCIENCE

Purchase Agreement Outcomes

- New Zealand Antarctic science makes a significant contribution to the understanding of Antarctic ecosystems and global change.
- Increased international profile through high quality science and collaborations with international partners.
- Research in and related to Antarctica is recognised as a valuable part of New Zealand's science investment by MoRST, the Foundation and research providers, with PGSF and University funding at least maintained at its current level.

Activity	Performance Measures	Progress to date						
<p>Science Management and Facilitation Manage a process for an interim "Application for Support" for Antarctic and Southern Ocean science, and initial selection of acceptable projects using the Antarctic Research Committee.</p> <p>Co-ordinate a strategy for Southern Ocean research for 2001/06 years.</p> <p>Co-ordinate a workshop on the Latitudinal Gradient Project in August 2000.</p> <p>Provision of logistic support to science projects in Antarctica.</p> <p>Predict logistics capabilities needed to support new science initiatives/directions.</p>	<p>Successful completion of the interim selection process by November 2000.</p> <p>First draft of a Southern Ocean research strategy (incorporating the Marine Biodiversity strategy) by June 2001.</p> <p>Participation in a Marine Biodiversity of the Ross Sea workshop in November 2000.</p> <p>Latitudinal Gradient Workshop held in Christchurch in August 2000. Recommendations from the workshop will be used for logistic planning.</p> <p>All approved science projects are appropriately supported in Antarctica to achieve project goals. A safe, sustainable operating environment is maintained and ongoing safety review and analysis conducted, including provision of appropriate safety training to personnel operating in Antarctica. Safety, timeliness and efficiency of support delivered, is reflected in event post-deployment reports, and by Health and Safety Audits.</p> <p>Identify future long term plans which may require new logistical capabilities.</p> <p>Develop science, logistics and business plans for the Latitudinal Gradient Project, Antarctic Earth Sciences Drilling Consortium and Southern Ocean Research.</p>	<p>Achieved - A total of nine interim round proposals were received. The proposals were peer-reviewed and reviewed by the Antarctic Research Committee. Six proposals were approved for support in the 2001/2002 season.</p> <p>Under action - An outline for a Southern Ocean research strategy has been initiated. The strategy will incorporate the marine aspects of the Latitudinal Gradient Project and research related to the Balleny Islands. Because of these additional contributions to the strategy and the international co-ordination involved, the larger science community will be consulted and a new date for the 1st draft has been set for May 2002.</p> <p>Revised - MFish decided not to have the workshop. Antarctica New Zealand has been working directly with MFish on an interim science plan for the Ross Sea region biodiversity programme (BioRoss).</p> <p>Achieved - The Latitudinal Gradient Project workshop was held in Christchurch on 15-16 August 2000. A comprehensive report was published in May 2001. The report details six general research strategies; research priorities for terrestrial, freshwater and marine ecosystems; discusses site selection and environmental impacts associated with the project.</p> <p>Achieved - The summer season was completed, with 141 science event personnel deployed. The post season debrief reviewed operational issues in April, and a number of procedure reviews are underway, including recruitment and selection of staff, training, EMS compliance, and OSH. There were no major health and safety or environmental compliance issues.</p> <p>Under action - A science and technical workshop on ANDRILL has been held at Victoria University of Wellington. The workshop announced ANDRILL to the New Zealand science community and identified areas of scientific interest and research capability within the New Zealand community. A report of the workshop will be released in July 2001. The report will help formulate a practical strategy and plan for New Zealand science participation and logistics provision in ANDRILL. Antarctica New Zealand is working closely with the Ministry of Fisheries to support the Biodiversity Strategy Marine Biodiversity research programme on the biodiversity of the Ross Sea region. The Latitudinal Gradient Project planning is progressing subsequent to the August workshop.</p>						
		<table border="1"> <tr> <td data-bbox="916 1933 995 1957">Cost</td> <td data-bbox="995 1933 1337 1957">Estimate</td> <td data-bbox="1337 1933 1474 1957">\$4,576,364</td> </tr> <tr> <td></td> <td data-bbox="995 1957 1337 1982">Actual</td> <td data-bbox="1337 1957 1474 1982">\$5,167,568</td> </tr> </table>	Cost	Estimate	\$4,576,364		Actual	\$5,167,568
Cost	Estimate	\$4,576,364						
	Actual	\$5,167,568						

Activity	Performance Measures	Progress to date						
<p>International Science Linkages Continue to increase international connections in Antarctic science with Canada, Malaysia, Italy, Sweden and Australia.</p> <p>In conjunction with these ongoing projects, consideration of mechanisms to attract further international involvement in Antarctic science through New Zealand.</p>	<p>Latitudinal Gradient Project - facilitate interaction with other countries, in particular United States, Italy and Australia.</p> <p>Post CRP stratigraphic drilling - influence in the development of an Antarctic Earth Sciences Drilling Consortium.</p> <p>Southern Ocean Research - research plan to include consideration of co-operation with USA, Italy and Australia.</p> <p>A paper on attracting international Antarctic science involvement through New Zealand.</p>	<p>Under action - United States participation in the August workshop and discussions with the Italian Antarctic Programme at the COMNAP meeting. Two New Zealanders participated in a United States planning workshop where the New Zealand Latitudinal Gradient Project report was used as a basis for their planning.</p> <p>An international Latitudinal Gradient Project workshop is planned for August 2001 in conjunction with the SCAR Biology Symposium.</p> <p>Under action - ANDRILL science steering committee established (ASC) with representatives from United States, Italy, Germany, United Kingdom and New Zealand. A New Zealand-wide science and logistic meeting was held at Victoria University, Wellington on 12-13 June. This meeting has begun to lay-out what New Zealand can offer the international partners with regard to science and logistics capabilities.</p> <p>Under action - Continued discussions with the United States, Italy and Australia, including possibilities for linkages with LGP.</p> <p>Achieved - Paper completed and discussed with Gateway Antarctica at the University of Canterbury.</p> <table border="1" data-bbox="879 992 1476 1059"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$116,479</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$28,270</td> </tr> </table>	Cost	Estimate	\$116,479		Actual	\$28,270
Cost	Estimate	\$116,479						
	Actual	\$28,270						
<p>Reporting Science Public education and awareness of recent scientific events and findings.</p> <p>Annual Report includes contribution of science using the five strategy themes and updates to the new Antarctica New Zealand WebSite.</p> <p>Create a ten-year running bibliography on New Zealand's Antarctic publications.</p>	<p>Coordination of an Antarctic one-day seminar to the media and public in March 2001.</p> <p>Annual report completed on time and reflects a commitment to future developments in science.</p> <p>The WebSite has up to date scientific information relating to past findings and future directions.</p> <p>The new ten-year bibliography is completed by September 2000.</p>	<p>Achieved - Seminar held on 30 April in cooperation with Gateway Antarctica in Christchurch. The seminar series consisted of nine invited lectures pertaining to Antarctic system science. In conjunction with the seminar, a one-day Annual symposium on New Zealand Antarctic research was held at the University the following day, 1 May.</p> <p>Achieved - Annual Report has been completed, and included a section on future science developments.</p> <p>Achieved - The WebSite has been updated to reflect the science initiatives, for example, Latitudinal Gradient Project report, annual workshop announcements and information on the five science themes.</p> <p>Achieved - Bibliography (1957-present) completed and is searchable on the Antarctica New Zealand WebSite.</p> <table border="1" data-bbox="879 1592 1476 1682"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$21,752</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$0 incorporated into Science Management and Facilitation</td> </tr> </table>	Cost	Estimate	\$21,752		Actual	\$0 incorporated into Science Management and Facilitation
Cost	Estimate	\$21,752						
	Actual	\$0 incorporated into Science Management and Facilitation						

Activity	Performance Measures	Progress to date						
<p>Science Funding Continued advocacy for Antarctic science to maintain the level of PGSF and non-PGSF funding in the future and the creation of an “Antarctic Science Foundation” to increase future science funding.</p> <p>Antarctic research scholarships.</p>	<p>Play an active role in the Antarctic Reference Group set-up by the Foundation.</p> <p>Draft a business plan for the Antarctic Science Foundation concept by March 2001.</p> <p>Attract interest in Antarctic research from science sector(s) not traditionally involved.</p> <p>Co-ordinate the provision of sponsorships for at least two scholarships and the selection of recipients.</p>	<p>Achieved - The Science Strategy Manager has been an active participant on the committee.</p> <p>Achieved - A paper on the Foundation concept was presented and accepted at the June Board meeting.</p> <p>Under action - NIWA has expressed an interest to increase its Southern Ocean research effort. This interest has been turned into an increased research effort this coming season with \$300K of internal funding for research provided by NIWA.</p> <p>The interim bidding round attracted international interest in marine research on benthic communities in McMurdo Sound. A research group from the University of Canterbury and the Australian Institute of Marine Science has been accepted for logistics support this season to work on “Human impacts and the microbial-chemical ecology of Antarctic sponges”. This work will be funded jointly by FRST and the Australian government.</p> <p>Achieved - Three scholarship winners were selected from a group of 23 applications. Each scholar will receive \$10,000 to pursue their research with sponsorship from New Zealand Post and Kelly Tarlton’s Antarctic Encounter and Underwater World.</p>						
		<table> <tr> <td>Cost</td> <td>Estimate</td> <td>\$100,567</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$14,108</td> </tr> </table>	Cost	Estimate	\$100,567		Actual	\$14,108
Cost	Estimate	\$100,567						
	Actual	\$14,108						

		Estimate	Actual
Costs (excl GST)	Direct Costs	\$3,748,843	\$3,331,257
	Overhead	\$1,066,319	\$1,878,689
	Total:	\$4,815,162	\$5,209,946

1.2 ENVIRONMENTAL STEWARDSHIP

Purchase Agreement Outcomes

- Antarctica New Zealand activities, including implementation of actions from the New Zealand Environmental Strategy for the Ross Sea region, demonstrate leadership in Antarctic environmental management and are adopted nationally and internationally.
- The development of the Ross Sea Region State of the Environment Report provides the platform for the development of a regional process for reporting on the environment and a basis for management of human activities in the region.

Activity	Performance Measures	Progress to date						
<p>Implementing Environmental Management Strategy Implementation of the Antarctica New Zealand Environmental Management System (EMS).</p> <p>Continued upgrade of Scott Base waste management systems.</p> <p>Clean up and remediation at Cape Hallett.</p> <p>Site Visitor Guide for the Ross Sea Region.</p>	<p>EMS 12-month review report demonstrates that Antarctica New Zealand EMS implementation consistent with AS/New Zealand ISO 14001:1996.</p> <p>Recommendation developed on preferred option for sewage treatment by 31 August 2000 consistent with Antarctic best practice.</p> <p>Joint United States/New Zealand team deployed to Cape Hallett in February 2001 to carry out site assessment.</p> <p>Joint clean up and remediation plan prepared with the United States.</p> <p>Feasibility explored of developing an 'Oceanities' type site guide for areas visited by tourist ships in the Ross Sea Region.</p>	<p>Achieved - Report from external auditor found that the EMS is generally compliant with ISO 14001, and certification would be achievable within a year with only relatively minor improvements.</p> <p>Achieved - Decision made to treat Scott Base sewage, with identification and comprehensive evaluation of options for treatment completed. Short list of four recommended options put out for tender for final selection at August 2001 Board meeting. Initial environmental evaluation completed and submitted to MFAT and EARP.</p> <p>Achieved - Antarctica New Zealand Environmental Manager member of four person New Zealand/United States team which visited Cape Hallett in January/February 2001. Extensive survey of site completed, including environmental sampling.</p> <p>Achieved - Clean up plan developed, with detailed work continuing on immediate priority areas for 2001/02.</p> <p>Achieved - Feasibility paper developed with analysis of options and costs including possible sites and resource requirements.</p> <table border="1" data-bbox="906 1055 1473 1115"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$25,784</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$84,835</td> </tr> </table>	Cost	Estimate	\$25,784		Actual	\$84,835
Cost	Estimate	\$25,784						
	Actual	\$84,835						
<p>Environmental Performance and Compliance Ensuring compliance with Antarctica (Environmental Protection) Act by persons involved in Antarctica New Zealand managed activities.</p> <p>Implementation of Antarctica New Zealand environmental monitoring programme.</p>	<p>Environmental impact assessment (EIA) and permitting processes are completed for all Antarctica New Zealand supported activities.</p> <p>Environmental authorisations detailing specific activities are issued to all events according to Antarctica New Zealand permits.</p> <p>End of season and incident reporting demonstrates that all activities supported by Antarctica Zealand in Antarctica comply with the Antarctica (Environmental Protection) Act.</p> <p>All Antarctica New Zealand staff and visitors are provided with appropriate education and training about environmental requirements.</p> <p>Monitoring of agreed indicators carried out in 2000/2001 season to provide a baseline assessment of environmental performance including major impacts.</p> <p>Review of indicators for Antarctica New Zealand activities completed taking account of monitoring results and outcomes of Ross Sea Region State of the Environment Report.</p>	<p>Achieved - All EIAs completed and reviewed by EARP, and permit letter received from Minister of Foreign Affairs to cover science and non-science activities for 2000/2001.</p> <p>Achieved - Authorisations for all events have been issued according to Antarctica New Zealand permit. Revisions to authorisations have been made for all approved changes to EIAs.</p> <p>Predominantly achieved - Environmental Performance Report completed and provided to MFAT and EARP. Several minor non-compliances noted with preliminary environmental evaluations, and one significant environmental incident involving a science party at Cape Adare. Detailed report on this incident provided separately to MFAT and EARP.</p> <p>Achieved - Ongoing training programmes implemented, including intensive training for all Scott Base staff, distribution of educational material (reviewed and updated for 2000/2001) to all visitors and on the ice training as appropriate to each event.</p> <p>Achieved - Monitoring programme (including indicators) for 2000/2001 agreed. Monitoring of indicators carried out during the season at Scott Base and for selected field sites. Results have been incorporated into end of season compliance report.</p> <p>Under action - Awaiting publication of report.</p>						

Activity	Performance Measures	Progress to date						
<p>Monitoring and compliance of activities (as feasible) in relation to non-Antarctica New Zealand managed activities in the Ross Dependency which come under the Antarctica (Environmental Protection) Act.</p>	<p>Reports on relevant monitoring and compliance activities provided to MFAT.</p> <p>Logistics support, personnel and appropriate training provided for the New Zealand Representatives programme for four vessels in the Ross Dependency.</p> <p>Review of future regional monitoring requirements in context of outcomes of the Ross Sea Region State of the Environment Report (also see below).</p>	<p>Not required - No monitoring/compliance reports required.</p> <p>Achieved - Participated in selection process for representatives, logistic support requirements included in operations programme for 2000/2001, one Antarctica New Zealand staff member acted as a representative. A training session was completed for all representatives in November. All representatives provided with information packs in consultation with the Department of Conservation and MFAT. Identification of issues from representative reports completed and participated in debrief meeting in April.</p> <p>Under action - Awaiting publication of report.</p> <table border="0" data-bbox="900 651 1476 712"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$197,567</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$108,205</td> </tr> </table>	Cost	Estimate	\$197,567		Actual	\$108,205
Cost	Estimate	\$197,567						
	Actual	\$108,205						
<p>Provision of Expert Advice to EARP Provision of high quality expert advice on EIAs and other significant environmental issues as requested to EARP.</p> <p>Provision of advice on national Antarctic environmental policy issues to MFAT and the OAC.</p>	<p>Expert advice to the Environmental Assessment and Review Panel (EARP):</p> <ul style="list-style-type: none"> ■ meets timelines set by EARP; ■ is proactive, highlighting emerging issues where appropriate; ■ includes consideration of all relevant available information; and ■ includes consideration of relevant scientific, technical and operational aspects. <p>Policy contributions and advice to MFAT and OAC meet the policy advice criteria outlined above.</p>	<p>Achieved - Participated in EARP meeting in December and provided advice as required throughout the year. Also provided comments on fishing, tourism and other EIAs as appropriate to EARP.</p> <p>Achieved - Ongoing dialogue with MFAT and OAC, including attendance at OAC meetings.</p> <table border="0" data-bbox="900 1061 1476 1122"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$7,766</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$6,858</td> </tr> </table>	Cost	Estimate	\$7,766		Actual	\$6,858
Cost	Estimate	\$7,766						
	Actual	\$6,858						
<p>Ross Sea Region State of the Environment Report (RSR SOER) Project manage the Ross Sea Region State of the Environment Report.</p> <p>Identify priority environmental initiatives for follow on from the report, in particular for future state of the environment reporting and monitoring in the Ross Sea region.</p> <p>Identify opportunities for international profile and influence in state of the Antarctic environment reporting from the publication of the report.</p>	<p>Ross Sea Region State of the Environment Report completed and meets project terms of reference.</p> <p>RSR SOER launch function provides significant profiling of Antarctica New Zealand and environmental stewardship role.</p> <p>Draft paper prepared on future regional environmental priorities (within the context of the New Zealand Environmental Strategy for the Ross Sea Region).</p> <p>Input into identifying marine biodiversity research priorities.</p> <p>RSR SOER profiled (through papers, presentations/lectures, advocacy) in appropriate international forums (SCAR 2000, CEP/ATCM 2000) and with the United States and Italian Antarctic programmes and science communities.</p> <p>Opportunities identified for New Zealand involvement and contribution to Antarctic-wide SOER.</p>	<p>Under action - Drafting of report completed and in final design and proofing stages. In consultation with Oversight Group and Minister, official launch of the report now planned for 12 November.</p> <p>Under action - In consultation with Oversight Group and Minister, official launch of the report now planned for 12 November.</p> <p>Under action - Awaiting publication of report.</p> <p>Achieved - Ongoing co-ordination with Ministry of Fisheries on marine research priorities (for biodiversity funding).</p> <p>Under action - Paper presented at CEP 2000 and material distributed at SCAR 2000 meeting.</p> <p>Under action - Established links with SCAR regarding Antarctic-wide SOER including recognition of importance of RSR SOER in moving the process forward. Discussions with Australia over Antarctic content in next Australian SOER.</p> <table border="0" data-bbox="900 1854 1476 1917"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$69,599</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$47,028</td> </tr> </table>	Cost	Estimate	\$69,599		Actual	\$47,028
Cost	Estimate	\$69,599						
	Actual	\$47,028						
<p>Protected Area Management & Development Revision of protected area management plans for Cape Bird and Mt Melbourne protected areas.</p>	<p>Final Cape Bird plan submitted to 2000 CEP/ATCM. Draft plan for Mt Melbourne protected area completed and submitted to GOSEAC 2001 meeting.</p>	<p>Under action - Final Cape Bird plan submitted and adopted by 2000 ATCM. Work continuing on Mt Melbourne plan. However mapping deficiencies mean that further field work is required in 2001/2002 season, and the submission of the plan to the CEP will be delayed until at least the 2002 CEP meeting depending on outcome of field work.</p>						

Activity	Performance Measures	Progress to date
Provision of input and advice on the ongoing development of a protected area proposal for the Balleny Islands.	Input and advice contribute to the further development of the management plan for proposed Balleny Islands protected area.	Achieved - Provided revised version of plan for July meeting of CCAMLR working group on Environmental Monitoring and Management, and a further revision (including updating and refinement of maps) for CCAMLR meeting in Hobart in October. Presented an update on the proposal to the CEP in September and generally advocated for the concept during the meeting. Followed up with New Zealand delegation to CCAMLR following the Hobart meeting and actively participated in two Outreach meetings hosted by MFAT. Working group now established to take the process forward to be led by Antarctica New Zealand.
Development of specially managed areas for Hut Point Peninsula and the McMurdo Dry Valleys.	Significant work on first draft plan for Hut Point completed with the United States. Process and terms of reference agreed for Dry Valleys ASMA with the United States.	Under action - Some draft sections of Hut Point Plan completed, difficult to make further progress with United States currently focused on Dry Valleys ASMA plan. Agreement reached and details confirmed for a drafting workshop on the Dry Valleys ASMA with the United States in August 2001.
		Cost Estimate \$25,371 Actual \$9,060
International Environmental Initiatives Contribution to the New Zealand influence in the Committee for Environmental Protection (CEP).	Participate in New Zealand delegation to the CEP in September 2000. Expert advice provided within the New Zealand delegation. CEP inter-sessional work on protected areas work is co-ordinated prior to the CEP meeting.	Achieved - Environmental Manager and Chief Executive members of New Zealand delegation to CEP. Achieved - Environmental Manager took active role within the New Zealand delegation, including provision of advice on key issues, such as protected areas, state of the environment reporting and EIAs (also refer to International Influence), to the New Zealand CEP representative. Achieved - Inter-sessional work completed with three working papers drafted and presented at the meeting by the Antarctica New Zealand Environmental Manager. Outcomes of work favourably received, with the adoption of guidelines for implementation of protected area provisions in the Environmental Protocol, as well as a procedure by which the CEP will consider draft management plans for protected areas in future.
Participation in the Antarctic Environmental Officers Network (AEON), including facilitation and/or input to key initiatives.	Papers drafted on the Balleny Islands protected area proposal, Cape Bird protected area revised management plan, the RSR SOER, Cape Roberts Project environmental management update and outcomes of the protected areas inter-sessional work. AEON co-ordinator until September 2000. Ongoing active participation in the steering group. Contribute to work on implementation of recommendations from the Goa AEON workshop, in particular preparation of guidelines for designing and developing monitoring programmes; review of existing initial environmental evaluations (IEEs); and processes for environmental information exchange at multiple operator sites.	Achieved - All papers prepared and presented at the CEP meeting in the Hague, September 2000. Achieved - Resigned as AEON co-ordinator at end of September 2000 and remain as member of the steering group. Work progressing on several AEON/COMNAP initiatives (see below). Achieved - Terms of reference agreed and contract let for the development of monitoring guidelines. Antarctica New Zealand Environmental Manager is a member of the working group for this initiative. Also co-ordinator for AEON working group on IEE analysis with terms of reference and draft methodology developed. Work on processes for environmental information exchange have been put on hold by AEON until after other work completed.
		Cost Estimate \$15,531 Actual \$0 incorporated into international Representation

		Estimate	Actual
Costs (excl GST)	Direct Costs	\$265,967	\$165,417
	Overhead	\$75,651	\$90,569
	Total:	\$341,618	\$255,986

1.3 PUBLIC AWARENESS AND EDUCATION

Purchase Agreement Outcomes

- Public awareness of the global significance of Antarctica and the Southern Ocean, to create a constituency of interest that encourages and underpins a continuing strong national involvement in the Ross Dependency, and international influence to encourage compliance with the Antarctic Treaty System.

Activity	Performance Measures	Progress to date						
<p>Facilitation of Antarctic Education Implement greater level of provision of high quality education about New Zealand's Antarctic interests and activities.</p> <p>Encourage University Antarctic study.</p> <p>Initiate a new national secondary school education programme.</p> <p>Antarctic science post-graduate scholarship scheme.</p>	<p>Organise educators from Auckland Museum, Southland Museum, Canterbury Museum, Kelly Tarlton's Underwater World, and the International Antarctic Centre's Visitor Centre to visit Antarctica 2000/2001 season.</p> <p>Maintain Antarctica New Zealand's involvement with the University of Canterbury Gateway Antarctica programme.</p> <p>Burnside High School project in 2000/2001 and development of a national scheme.</p> <p>Identify private sector sponsors to a minimum of two scholarships.</p>	<p>Achieved - Educators completed a successful visit to Antarctica with follow-up plans for local programmes started in Southland and Auckland. Southland programme particularly successful with high local profile and increased interest from Southland primary schools. Successful new initiative with Otago Museum to develop an Antarctic section.</p> <p>Achieved - Chief Executive on Gateway Board. Gateway Antarctica Graduate Certificate students successfully completed their visit to the Antarctic as the practical part of their course. Antarctica New Zealand staff continued to contribute as part of the lecture programme.</p> <p>Achieved - A group of four 6th form Burnside Students went to Scott Base in January to undertake a living history study of the Trans-Antarctic Expedition (TAE). They then worked with the entire history class at Burnside to develop an oral history through interviews with former TAE participants. They have undertaken several public speaking engagements since their visit including talking to Canterbury secondary school teachers.</p> <p>Education programme advertised nationally for 2001/2002 season and proposal selected from Tauranga Girls High School.</p> <p>Achieved - Confirmed sponsorships are New Zealand Post and Kelly Tarlton's Underwater World.</p> <table border="1"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$495,393</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$324,595</td> </tr> </table>	Cost	Estimate	\$495,393		Actual	\$324,595
Cost	Estimate	\$495,393						
	Actual	\$324,595						
<p>Enhancing Public Awareness Grow and develop the Artists to Antarctica programme.</p> <p>Improve general public awareness and understanding of the Antarctic environment.</p>	<p>Implement the visit of the two Antarctic Arts Fellows to Antarctica 2000/2001 season; assist with the hosting of an Antarctic exhibition within New Zealand; work with the Christchurch Art Gallery and Te Papa to extend the potential for travelling exhibitions nationally and internationally.</p> <p>Provide specific opportunities for media visits to Antarctica including film and documentary makers, mainstream news reporters and specialist reporters.</p> <p>Provide opportunities for key influencers and decision-makers to visit Antarctica through the Distinguished Visitor programme and highlight their visit by the inclusion of media where appropriate.</p>	<p>Achieved - Arts Fellows for the 2000/2001 season, dance choreographer Bronwyn Judge and ceramics artist Raewyn Atkinson, successfully completed their visit to the Antarctic in December and have begun working on their individual projects. Bronwyn Judge will premier an Antarctic choreographed work in Dunedin in March 2002. Raewyn Atkinson will exhibit her first Antarctic works in the Dowse Gallery in Lower Hutt at the beginning of 2002. Met with representatives of Dunedin Art Gallery to further interest in Antarctic touring exhibitions.</p> <p>We are working closely with the Christchurch Art Gallery to develop a permanent Antarctic collection and to involve an Antarctic Arts Fellow in their new gallery opening exhibition. The gallery has confirmed Auckland sculptor Virginia King will be their opening exhibitor. Work continuing with Te Papa to explore the feasibility of an interactive display.</p> <p>Antarctica New Zealand successfully hosted an Art patrons' function in Auckland at which several works by Antarctic artists were promoted. Speakers included poet Bill Manhire, sculptor Virginia King, and painter Nigel Brown.</p> <p>Achieved - A group of four journalists visited Antarctica under our Media Initiatives programme in November. They spent a week interviewing scientists, staff at Scott Base and exploring ideas for public information and education. Each journalist has contributed to the growing public awareness about Antarctica with individual articles printed in newspapers, journals and magazines.</p> <p>Achieved - There were two Distinguished Visitor groups this season. Cabinet Ministers Phil Goff, Pete Hodgson, Marion Hobbs and Matt Robson were escorted by Chief Executive Gillian Wratt on a familiarisation visit. New Zealand art patron Jenny Gibbs, the former Chief Executive of the New Zealand Tourism Association Glenys Coughlan, Swedish polar ambassador Eva Kettes and a senior scientist from Ministry of Fisheries Neville Smith were also hosted by Antarctica New Zealand on a familiarisation visit.</p>						

Activity	Performance Measures	Progress to date				
Develop an Artists to Antarctica alumni.	<p>Participate in the Science Festival 2000 in Dunedin.</p> <p>Develop a public speaker programme for Antarctica New Zealand Chief Executive, Science Strategy Manager and Environmental Manager.</p> <p>Enhanced relationship between former and new artists.</p> <p>Provide incentive to further develop art works.</p> <p>Capture a listing of ongoing activities by members of the alumni which involve the Antarctic in some way and which can assist the Antarctica New Zealand public profile.</p>	<p>Achieved - Antarctica New Zealand participated in the Science Festival in August. It was extremely successful with several hundred visitors to our stand and increased access to our WebSite.</p> <p>Under action - Antarctica New Zealand senior managers contributed to a special public lecture series at the University of the Third Age; Science Strategy Manager gave a presentation to the Vice Chancellor's Special Symposia at the Auckland University; Chief Executive presented to Christchurch CEO's forum, stakeholder functions in Auckland and Dunedin, and NZIM Women's Forum.</p> <p>Achieved - The artists programme is enhanced with former Antarctic Arts Fellows working with new programme participants in staging exhibitions and collaborating on new works, for example, Virginia King, an Auckland sculptor and Chris Cree Brown, musician composer, have worked together in the preparation of Ms King's national touring exhibition 'Antarctic Heart'.</p> <p>Achieved - Former Antarctic Arts Fellows have worked individually and collaboratively with Antarctica New Zealand in the development of an ongoing list of events, performances, exhibitions and activities in New Zealand and overseas.</p> <p>Achieved</p>				
	<table border="0"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$706,512</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$492,120</td> </tr> </table>	Cost	Estimate	\$706,512		Actual
Cost	Estimate	\$706,512				
	Actual	\$492,120				

		Estimate	Actual
Costs (excl GST)	Direct Costs	\$935,743	\$522,210
	Overhead	\$266,162	\$294,505
	Total:	\$1,201,905	\$816,715

1.4 ENCOURAGEMENT OF SCHOLARSHIP

Purchase Agreement Outcomes

- Increased academic interest in Antarctic and Southern Ocean issues.
- Increased New Zealand influence on Antarctic policy and issues relating to Antarctica and the Southern Ocean.
- Broaden New Zealand's Antarctic areas of expertise.

Activity	Performance Measures	Progress to date						
<p>National Interest Support the continuing development of interest in Antarctic scholarship at the University of Canterbury and a co-ordinated national approach.</p>	<p>Antarctica New Zealand staff involved in lecturing to the Canterbury University Antarctic Certificate course.</p> <p>Membership of the Board of the Canterbury University Antarctic Studies Centre (Gateway Antarctica).</p> <p>Facilitate at least one new opportunity for academic work at Gateway Antarctica.</p> <p>Support other Universities' interests in Antarctic courses.</p> <p>Creation of a one-year graduate internship at Antarctica New Zealand in association with Canterbury University by June 2001.</p>	<p>Achieved - Environmental Manager, Science Strategy Manager, Chief Executive and Information Services Specialist, participated in the delivery of lectures during the course.</p> <p>Achieved - Antarctica New Zealand plays an active role on the Gateway Antarctica Board through Chief Executive Board membership and Science Strategy Manager involvement as requested.</p> <p>Under action - Following from Latitudinal Gradient Project linkages established by Antarctica New Zealand, Dr Paul Berkman from the Ohio State University is a possible guest scholar with Gateway Antarctic in 2001.</p> <p>Achieved - Discussions with University of Auckland on a lecture series for secondary school students and teachers. The Antarctica New Zealand Board has met with the Vice Chancellor and members of the science faculty of Otago University, and the University of Auckland.</p> <p>Under action - One graduate from the course employed on environmental projects by Antarctica New Zealand.</p>						
		<table border="0"> <tr> <td>Cost</td> <td>Estimate</td> <td style="text-align: right;">\$62,646</td> </tr> <tr> <td></td> <td>Actual</td> <td style="text-align: right;">\$0 incorporated into Facilitation of Antarctic Education</td> </tr> </table>	Cost	Estimate	\$62,646		Actual	\$0 incorporated into Facilitation of Antarctic Education
Cost	Estimate	\$62,646						
	Actual	\$0 incorporated into Facilitation of Antarctic Education						

1.5 ADVICE ON POLICY

Purchase Agreement Outcomes

- Advice on policy includes proactively seeking to ensure that private sector activity in Antarctica is fully consistent with Government objectives in the region.

Activity	Performance Measures	Progress to date						
Facilitation of Private Sector Activities Review and analyse proceedings of the Tourism Workshop (June 2000).	Present the outcomes of the Tourism Workshop (June 2000) nationally to stimulate policy development and internationally to consider the implications of issues raised.	<p>Achieved - The Tourism Workshop proceedings have been distributed to a wide international audience including Australia, United States, Canada, the Netherlands, Germany and the workshop participants. Inquiries are still coming in. The proceedings have also been posted on the WebSite. Nationally, the proceedings have been circulated to MFAT and OAC members to promote further discussion.</p> <table border="1"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$42,682</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$50,988</td> </tr> </table>	Cost	Estimate	\$42,682		Actual	\$50,988
Cost	Estimate	\$42,682						
	Actual	\$50,988						
Contribution to Policy Development Proactively seeking to ensure that private sector activity in Antarctica is fully consistent with Government objectives in the region.	<p>Develop and begin implementation of a strategic plan to manage appropriate interaction between Antarctica New Zealand and the private sector, that is consistent with Antarctica New Zealand's vision and statutory responsibilities and government policy, by 30 December 2000.</p> <p>Identify potential private sector interests for science, environmental and/or education projects and source and conclude a minimum of two partnership/sponsorships for specific science or environmental initiatives.</p>	<p>Under action - Two internal workshops with the Antarctica New Zealand Board and senior staff to fully analyse and assess the approach to the potential for private sector funding and at what level that funding should be sought.</p> <p>Under action - Antarctica New Zealand has established a venture with the International Antarctic Centre Visitor Centre which is producing a range of clothing. A percentage of the annual sales will go to the Antarctic Foundation being set up by Antarctica New Zealand. An agreement is also being negotiated for a share of the Scott Base shop and bar proceedings to go to the Antarctic Foundation.</p> <table border="1"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$45,994</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$0 incorporated into Planning and Facilitation of Science, Environmental Stewardship, Public Awareness and Education and International Representation.</td> </tr> </table>	Cost	Estimate	\$45,994		Actual	\$0 incorporated into Planning and Facilitation of Science, Environmental Stewardship, Public Awareness and Education and International Representation.
Cost	Estimate	\$45,994						
	Actual	\$0 incorporated into Planning and Facilitation of Science, Environmental Stewardship, Public Awareness and Education and International Representation.						

		Estimate	Actual
Costs (excl GST)	Direct Costs	\$69,039	\$32,602
	Overhead	\$19,637	\$18,386
	Total:	\$88,676	\$50,988

1.6 INTERNATIONAL INFLUENCE

Purchase Agreement Outcomes

- New Zealand profile and influence in the international management of Antarctica and the Southern Ocean, evidenced by New Zealand initiatives that Antarctica New Zealand has contributed to featuring in Antarctic Treaty Consultative meeting (ATCM), Committee on Environmental Protection (CEP) and Council of Managers of National Antarctic Programmes (COMNAP) etc. activities, and receiving international acknowledgement.
- New Zealand contribution to Antarctic and global environmental knowledge bases enhanced by Antarctica New Zealand activities.
- Antarctica New Zealand activities stimulate enhanced international commitment to conservation of Antarctica.
- Increased foreign involvement, research and scholarship in Antarctic activities through New Zealand as a result of Antarctica New Zealand initiatives.

Activity	Performance Measures	Progress to date						
<p>Operational / Science / Environmental Influence in international operational developments through the Council of Managers of National Antarctic Programmes (COMNAP) and its subgroups.</p> <p>Pursue international science partnerships and New Zealand leadership of international science projects.</p> <p>Pursue possibilities for international profile/influence from the RSR SOER.</p>	<p>Chair the COMNAP meeting in Tokyo in July 2000. Meeting outcomes to include advice to the next CEP meeting on operational liability issues, sharing of operations knowledge through a logistics symposium, and scoping of the mechanisms for collaboration in support of international science projects.</p> <p>Convene/co-ordinate the Antarctic Environmental Officers Network (AEON) until September 2000, ensuring publication of the AEON environmental monitoring handbook.</p> <p>Chair the Alternative Energy Management Working Group of COMNAP/SCALOP to provide information to member countries on energy usage, and on trends in development of alternatives to fossil fuel energy.</p> <p>Develop a plan for exchange of art in Antarctic exhibitions with other Treaty parties.</p> <p>Latitudinal Gradient Project - facilitate interaction with other countries, in particular United States, Italy and Australia.</p> <p>Post CRP stratigraphic drilling - influence in the development of an Antarctic Earth Sciences Drilling Consortium.</p> <p>Southern Ocean Research - research plan to include consideration of co-operation with United States, Italy and Australia.</p> <p>Present information on RSR SOER to SCAR meeting in July 2000, and to CEP meeting in September 2000.</p> <p>Identify opportunities for encouraging Antarctic-wide SOER, and for presenting to international environmental forums.</p>	<p>Achieved - COMNAP meeting chaired. Antarctica New Zealand Chief Executive term as COMNAP chairperson extended for a further year. COMNAP meeting followed by sub-group meeting regarding liability and paper prepared for CEP and ATCM liability meeting. Logistics Symposium run. Antarctica New Zealand Chief Executive co-chaired, with the Chair of SCAR (Scientific Committee on Antarctic Research) a workshop on international science and logistics co-operation. Chief Executive also chaired a meeting of the COMNAP Executive Committee with membership of United States, France, Chile and New Zealand in December.</p> <p>Achieved - Convened AEON until September CEP meeting – convening role passed onto Norway, with the Antarctica New Zealand Environmental Manager continuing on the AEON steering committee; Environmental Monitoring Handbook published - in hard copy, CD and on the COMNAP Web site.</p> <p>Achieved - Working Group meeting chaired, presentations on alternative energy included in the Logistics symposium.</p> <p>Collation of energy use data continues from national programmes. An energy efficient architectural design competition is being facilitated with Chile, for judging at the 2002 SCALOP symposium.</p> <p>Under action - A plan is being developed to work with identified Treaty parties to develop an international exhibition of Antarctic Art. The concept has been endorsed by Creative New Zealand. Further exploratory work is being undertaken with a view to the exhibition being mounted in 2003.</p> <p>Under action - See 1.1; International Science Linkages</p> <p>Under action - See 1.1; International Science Linkages</p> <p>Under action - See 1.1; International Science Linkages</p> <p>Achieved - Information provided to both meetings - background information to a SCAR State of the Antarctic Environment Report workshop, and an Information Paper to the CEP meeting.</p> <p>Under action</p>						
		<table border="0"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$70,457</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$59,840</td> </tr> </table>	Cost	Estimate	\$70,457		Actual	\$59,840
Cost	Estimate	\$70,457						
	Actual	\$59,840						

Activity	Performance Measures	Progress to date						
<p>Antarctic Treaty Consultative Meeting (ATCM) Contribute to MFAT and OAC consideration of ATCM issues, the New Zealand ATCM/CEP delegation, and a positive New Zealand profile in the Antarctic Treaty System.</p> <p>Contribution to the effective operation of the CEP.</p>	<p>Membership of the New Zealand delegation to the CEP and special ATCM in September 2000.</p> <p>Continue to co-ordinate the CEP inter-sessional work on protected areas through to the CEP meeting in September 2000.</p> <p>CEP papers on inter-sessional protected area work, the Balleny Islands protected area proposal, the Cape Bird/Caughley Beach Management Plan, the Ross Sea Region State of the Environment Report, and a CRP environmental update.</p> <p>Present a draft paper to MFAT/OAC for presentation to the ATCM/CEP on Antarctic tourism scenarios, risks and benefits following the tourism workshop.</p> <p>Pursue opportunities for Antarctica New Zealand Chief Executive candidacy for the CEP chair.</p>	<p>Achieved - Antarctica New Zealand Chief Executive and Environmental Manager members of New Zealand CEP and SATCM delegation.</p> <p>Achieved - Intersessional work completed with three working papers presented to the CEP, resulting in adoption of protected area guidelines by the meeting.</p> <p>Achieved - Papers prepared and presented to CEP meeting.</p> <p>Under action - Tourism workshop proceedings published, working with MFAT/OAC tourism sub group on policy development. Further work needed before presenting to ATCM/CEP.</p> <p>Under action - Antarctica New Zealand Chief Executive Vice Chair of CEP meeting. Agreed to support reappointment of current chair for a further two year period.</p> <table border="0" data-bbox="916 878 1479 922"> <tr> <td>Cost</td> <td>Estimate</td> <td>\$36,357</td> </tr> <tr> <td></td> <td>Actual</td> <td>\$36,625</td> </tr> </table>	Cost	Estimate	\$36,357		Actual	\$36,625
Cost	Estimate	\$36,357						
	Actual	\$36,625						

		Estimate	Actual
Costs (excl GST)	Direct Costs	\$83,160	\$59,942
	Overhead	\$23,654	\$36,523
	Total:	\$106,814	\$96,465

OUTPUT COSTS

	Actual	Estimate
Planning and Facilitation of Science		
Science Management and Facilitation	\$5,167,568	\$4,576,364
International Science Linkages	\$28,270	\$116,479
Reporting Science (1)	\$0	\$21,752
Science Funding	\$14,108	\$100,567
	\$5,209,946	\$4,815,162
Environmental Stewardship		
Implementing Environmental Management Strategy	\$84,835	\$25,784
Environmental Performance Compliance	\$108,205	\$197,567
Provision of Expert Advice to EARP	\$6,858	\$7,766
Project Managing the RSR-SOER	\$47,028	\$69,599
Protected Area Management and Development	\$9,060	\$25,371
International Environmental Initiatives (2)	\$0	\$15,531
	\$255,986	\$341,618
Public Awareness and Education		
Facilitation of Antarctic Education	\$324,595	\$495,393
Enhancing Public Awareness	\$492,120	\$706,512
	\$816,715	\$1,201,905
Scholarship		
National Interest (3)	\$0	\$62,646
	\$0	\$62,646
Advice on Policy		
Facilitation of Private Sector Activities	\$50,988	\$42,682
Contribution to Policy Development (4)	\$0	\$45,994
	\$50,988	\$88,676
International Representation		
International Operation Influence	\$59,840	\$70,457
ATCM	\$36,625	\$36,357
	\$96,465	\$106,814
TOTAL COSTS:	\$6,430,100	\$6,616,821

- (1) Reporting science - incorporated into Science Management and Facilitation.
- (2) International Environmental Initiatives - incorporated into International Representation.
- (3) Scholarship - incorporated into Facilitation of Antarctic Education.
- (4) Contribution to Policy Development - incorporated into Planning and Facilitation of Science, Environmental Stewardship, Public Awareness and Education and International Representation

Financial Statements

year ended 30 June 2001



Nigel Brown



Statement of Accounting Policies For The Year Ended 30 June 2001

Reporting Entity

Antarctica New Zealand is the trading name of the New Zealand Antarctic Institute, a Crown Entity established by the New Zealand Antarctic Institute Act 1996.

The financial statements have been prepared in accordance with The Public Finance Act 1989 as amended.

Measurement Base

The measurement and reporting of results, financial position, and cash flows is based on historical cost with the exception of clothing, the library collection and the art collection.

Accounting Policies

The following particular accounting policies which materially affect the measurement of financial performance, financial position, and cash flows have been established and consistently applied.

(a) Revenue Recognition

Revenue is recognised when earned and is reported in the Statement of Financial Performance in the period to which it relates.

(b) Leases

Antarctica New Zealand has not contracted for any lease that would be classified as a finance lease. Operating lease payments where the lessors effectively retain substantially all the risks and benefits of ownership of lease items are charged as expenses in the periods to which they relate.

(c) Fixed Assets

Expenditure incurred on fixed assets is capitalised where such expenditure will increase or enhance the future benefits provided by the assets. Expenditure incurred to maintain future benefit is expensed in the period incurred.

Fixed assets are valued at cost, adjusted for additions and disposals, less accumulated depreciation to date, except for the following three categories:

(i) Library Collection

Rare books are recorded at market value as at 30 June 1997 as determined by the Institute's librarian using published specialist price lists. This is deemed to be cost.

Other books provided by the Crown are valued at depreciated replacement cost as at 30 June 1997. This is deemed to be cost. Additions are recorded at cost less accumulated depreciation. Periodicals and other materials are expensed at time of purchase.

(ii) Clothing

Clothing is valued at depreciated replacement cost as at 30 June 1997. This is deemed to be cost. Additions are recorded at cost less accumulated depreciation.

(iii) Art Collection

The art collection is recorded at market value as at 9 September 1999 as determined by H Fisher & Son Limited fine art dealers. This is deemed to be cost.

(d) Depreciation

Depreciation is provided at rates estimated to write off the cost of the assets over their estimated useful lives. Depreciation is not charged on rare books. All other assets are depreciated on a straight line basis with the following exceptions:

(i) Computer hardware and software and communications equipment are depreciated on an accelerated basis reflecting the diminution in value as a result of rapid technological change.

(ii) Leasehold improvements are depreciated over the life of the improvement or the life of the lease whichever is shorter.

The useful lives of major classes of assets have been estimated as follows:

Buildings	10 years
Communications Equipment	5-7 years
Computer Hardware and Software	3-4 years
Scott Base Fit Out	20 years
Leasehold Improvements	15 years
Office Equipment	5 years
Office Furniture	5 years
Plant and Machinery	10 years
Vehicles	5 years
Clothing	10 years
Library Collection (excluding rare books)	20 years

(e) Employee Entitlements

Provision is made in respect of liabilities for annual leave, long service leave, contribution leave and retirement leave.

Calculation of the entitlement for annual leave is based on current rates of pay or the appropriate historical rate whichever is the highest.

Long service leave, contribution leave and retirement leave are calculated on an actuarial basis.

(f) Debtors

Debtors are stated at their estimated realisable value.

(g) Goods and Services Tax

The Financial Statements have been prepared exclusive of goods and services tax (GST) with the exception of debtors and creditors, which are stated GST inclusive.

(h) Income Tax

Antarctica New Zealand is a public authority for the purposes of income tax legislation and is exempt from income tax.

(i) Financial Instruments

Antarctica New Zealand is party to financial instruments as part of its normal operations. These financial instruments include bank accounts, short term deposits, receivables and payables. All financial instruments are recognised in the Statement of Financial Position and all revenues and expenses in relation to financial instruments are recognised in the Statement of Financial Performance.

(j) Foreign Currency

Transactions in foreign currencies are converted at the New Zealand rate of exchange ruling on the date of the transaction. Monetary assets and liabilities are converted to New Zealand dollars at the exchange rate ruling at balance date and any exchange gains or losses are taken to the Statement of Financial Performance.

Changes in Accounting Policies

There have been no changes in accounting policies. All policies have been applied on a basis consistent with those used in previous years.

Statement of Financial Performance for the year ended 30 June 2001

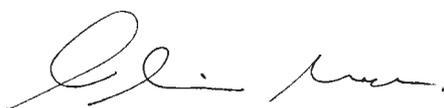
	Note	2001 Budget \$000	2001 Actual \$000	2000 Actual \$000
Revenue	1	6,640	6,635	6,052
Expenses		6,627	6,430	6,353
Operating surplus/(deficit)	2	13	205	(301)
Net Surplus/Deficit attributable to Taxpayers		13	205	(301)

Statement of Movements in Equity for the year ended 30 June 2001

	Note	2001 Budget \$000	2001 Actual \$000	2000 Actual \$000
Taxpayers funds at start of period		5,756	5,756	6,057
Net surplus/(deficit) for the period		13	205	(301)
Total Recognised Revenues and Expenses for the Period		13	205	(301)
Taxpayers funds as at 30 June 2001		5,769	5,961	5,756

Statement of Financial Position as at 30 June 2001

	Note	2001 Budget \$000	2001 Actual \$000	2000 Actual \$000
TAXPAYERS FUNDS				
Taxpayers Funds		5,769	5,961	5,756
Total taxpayers funds		5,769	5,961	5,756
Represented by:				
CURRENT ASSETS				
Cash and Short Term Deposits		2,261	2,752	3,159
Receivable and Prepayments	3	13	217	100
Total Current Assets		2,274	2,969	3,259
NON CURRENT ASSETS				
Fixed Assets	4	4,143	3,624	3,917
Total Non Current Assets		4,143	3,624	3,917
CURRENT LIABILITIES				
Payables and Accruals	5	503	505	1,279
Employee Entitlements	6	145	127	141
Total Liabilities		648	632	1,420
NET ASSETS		5,769	5,961	5,756



C Mace
Chairperson
15 October 2001



G Wratt
Chief Executive Officer
15 October 2001

Statement of Cash Flows for the Year ended 30 June 2001

	Note	2001 Budget \$000	2001 Actual \$000	2000 Actual \$000
CASH FLOWS FROM OPERATING ACTIVITIES				
Cash was provided from:				
Receipts from Crown		6,134	6,111	5,495
Receipts from Customers		338	290	466
Interest Received		214	218	163
Other receipts		0	0	0
Total Receipts		6,686	6,619	6,124
Cash was applied to:				
Payments to Suppliers		(4,831)	(4,755)	(2,647)
Payments to Employees		(1,871)	(1,961)	(2,125)
GST (net)		120	0	(2)
Total Payments		(6,582)	(6,716)	(4,774)
Net Cash inflow/(outflow) from Operating Activities	7	104	(97)	1,350
CASH FLOWS FROM INVESTING ACTIVITIES				
Cash was provided from: Sale of Fixed Assets				
		0	63	18
Cash was applied to: Purchases of Fixed Assets				
		(1,044)	(373)	(550)
Net Cash inflow/(outflow) from Investing Activities		(1,044)	(310)	(532)
CASH FLOWS FROM FINANCING ACTIVITIES				
Cash was provided from: Capital contribution				
		0	0	0
Cash was applied to: Payment of Crown liability				
		0	0	0
Net Cash inflow/(outflow) from Financing Activities		0	0	0
Net Increase (Decrease) in Cash Held		(940)	(407)	818
Add Opening cash and short term deposits		3,171	3,159	2,341
Closing cash and deposits		2,231	2,752	3,159

Actual receipts from Crown includes \$70,000 administered on an agency basis for the Ross Sea Region State of the Environment Report. At year end Antarctica New Zealand had \$82,000 of these funds on hand and included in cash and short term deposits.

Statement of Commitments as at 30 June 2001

	2001 Actual \$000	2000 Actual \$000
Capital Commitments	292	0
Operating Commitments	1,273	1,502
Total Commitments	1,565	1,502
Term Classification of Commitment		
Less than one year	714	417
One to two years	264	257
Two to five	587	772
Over five years	0	56
	1,565	1,502

Statement of Contingent Liabilities as at 30 June 2001

The Institute is currently clarifying aspects of Goods and Services Tax legislation in respect of the delivery of outputs at Antarctica. External advice indicates that the Institute may be eligible for a net refund. However, at balance date this has been neither quantified nor confirmed. In 2000, there were no contingent liabilities or contingent assets.

Notes to and Forming part of the Financial Statements for the year ended 30 June 2001

**Note 1
Revenue**

Revenue for the year includes the valuation of the Art Collection (\$62,335) for the first time

**Note 2
Operating Surplus (deficit)**

	2001 Actual \$000	2000 Actual \$000
After Charging		
Remuneration of Auditor		
- Audit Fee	14	14
- Other Services	0	1
Depreciation	715	709
Directors' Remuneration	57	49
Interest Expense	0	0
Rental and Operating Lease Costs	438	418
Bad Debts Written Off	2	0
Changes in Provision for Doubtful Debts	0	6
Assets written off	1	44
Restructuring Costs	0	193
After Crediting		
Interest Income	217	157
Gain on sale of assets	50	0

**Note 3
Receivables and Prepayments**

	2001 Actual \$000	2000 Actual \$000
Trade Debtors	200	82
Term Deposit Interest	17	18
Provision for Doubtful Debts	(6)	(6)
Net Trade Debtors	211	94
Prepayments	6	6
Total Receivables and Prepayments	217	100

**Note 4
Fixed Asset**

2001	Cost \$000	Accumulated Depreciation \$000	Book Value \$000
Buildings Scott Base	648	(179)	469
Leasehold Improvements	135	(73)	62
Communications Equipment	501	(464)	37
Plant and Machinery	1,507	(765)	742
Vehicles	411	(200)	211
Computer Hardware and Software	445	(362)	83
Scott Base Fit out	2,298	(1,123)	1,175
Office Furniture	36	(17)	19
Office Equipment	48	(36)	12
Clothing & Tents	273	(227)	46
Library Collection	135	(40)	95
Art Collection	62	0	62
Work in Progress	611	0	611
	7,110	(3,486)	3,624

2000	Cost \$000	Accumulated Depreciation \$000	Book Value \$000
Buildings Scott Base	638	(131)	507
Leasehold Improvements	134	(57)	77
Communications Equipment	467	(392)	75
Plant and Machinery	1,479	(608)	871
Vehicles	333	(127)	206
Computer Hardware and Software	397	(281)	116
Scott Base Fit out	2,298	(923)	1,375
Office Furniture	21	(14)	7
Office Equipment	38	(30)	8
Clothing	270	(216)	54
Library Collection	135	(32)	103
Work in Progress	518	0	518
	<u>6,728</u>	<u>(2,811)</u>	<u>3,917</u>

Work in progress represents items of capital expenditure that are not operational as at balance date.

Buildings are recorded at cost, less accumulated depreciation, which in the Directors' opinion is an indication of fair value.

In addition to rare and current books, Antarctica New Zealand has a resource of periodicals, maps, slides, photographs, films and microfiche located at Antarctica New Zealand and at Canterbury University. These items are expensed at time of purchase. Microfiche is physically held on loan from the US National Science Foundation.

Note 5

Payables and Accruals

	2001 Actual \$000	2000 Actual \$000
Trade Creditors and Accruals	226	129
Accrued Payroll	28	167
Directors' Fees	0	0
Fuel	121	98
NZDF charges	0	775
Other	130	110
	<u>505</u>	<u>1,279</u>

Note 6

Employee Entitlements

	2001 Actual \$000	2000 Actual \$000
Long Service Leave	6	7
Annual Leave	114	127
Retirement Leave	7	7
	<u>127</u>	<u>141</u>

Note 7

Reconciliation of Net Surplus to Net Cash Flow from Operating Activities

	2001 Actual \$000	2000 Actual \$000
Net Operating Surplus/(Deficit)	205	(301)
Add/(Less) Non-Cash Items		
Depreciation	715	709
Gain on Sale of Assets	(50)	
Art collection	(62)	0
Assets written off	0	44
Total Non-Cash Items	<u>603</u>	<u>753</u>
Add/(Less) Movements in Working Capital		
(Increase)/Decrease in receivables and prepayments	(117)	87
Increase/(Decrease) in payables and accruals	(788)	811
Working Capital Movements - Net	<u>(905)</u>	<u>898</u>
Net Cash Flow from Operating Activities	<u>(97)</u>	<u>1,350</u>

Note 8

Post Balance Date Events

No post balance date events have come to the attention of Antarctica New Zealand that are of a material nature as to require adjustment of the amounts contained in the financial statements or separate note disclosure.

**Note 9
Related Party Transactions**

Antarctica New Zealand is a Crown entity responsible to the Crown. All transactions with other Crown entities, Government departments and State Owned Entities are carried out on an arm's length basis.

The Crown has granted a license to Antarctica New Zealand in respect of the Scott Base facility. The initial term of this license was five years from 1 July 1996. This is currently being renegotiated.

**Note 10
Financial Instruments**

(A) Nature of activities and management policies with respect to financial instruments

1) Foreign Exchange Risk

Antarctica New Zealand undertakes transactions denominated in foreign currencies. As a result of these activities exposures in foreign currencies arise. It is the policy of Antarctica New Zealand to hedge significant currency risks associated with fuel purchases.

Antarctica New Zealand puts in place forward foreign exchange contracts to match anticipated purchases with budgeted costs for the period for which information is known.

There were no outstanding foreign exchange instruments as at balance date.

2) Credit Risk

In the normal course of business Antarctica New Zealand incurs credit risk from trade debtors and financial institutions. There are no significant concentrations of credit risk from trade creditors and exposures to them are monitored on a regular basis. Antarctica New Zealand places its cash and short term investments with high quality financial institutions which limits the amount of credit exposure. No collateral or security to support financial instruments is required due to the quality of the financial institutions dealt with.

3) Interest Rate Risk

Antarctica New Zealand has no significant exposure to interest rate risk on its financial instruments.

(B) Fair Values

The estimated fair values of Antarctica New Zealand's financial assets and liabilities are as disclosed in the Financial Statements.

**Note 11
Segmental Reporting**

Antarctica New Zealand operates primarily in the scientific research industry in New Zealand and Antarctica.

**Note 12
Remuneration of Employees**

Remuneration band	No of employees
\$100,001 – \$110,000	1
\$120,001 – \$130,000	1

Statement of Responsibility

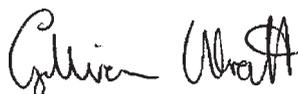
In the financial year ended 30 June 2001, the Board and management of Antarctica New Zealand were responsible for:

- the preparation of the financial statements and the judgements used therein.
- establishing and maintaining a system of internal control designed to provide reasonable assurance as to the integrity and reliability of financial reporting.

In the opinion of the Board and management of Antarctica New Zealand, the financial statements for the financial year fairly reflect the financial position and operations of Antarctica New Zealand.



C Mace
Chairperson
15 October 2001



G Wratt
Chief Executive Officer
15 October 2001

Performance indicators	2001	2001	2000
	Budget	Actual	Actual
Operating Results			
Revenue \$000	6,640	6,635	6,052
Surplus/(Deficit) \$000	13	205	(301)
Current Ratio	3.40	4.70	2.30
Working Capital	1,193	2,337	1,839
Ratio Personnel Expenses:			
Total Expenses	34.32%	30.50%	34.82%

TO THE READERS OF THE FINANCIAL STATEMENTS OF
THE NEW ZEALAND ANTARCTIC INSTITUTE
FOR THE YEAR ENDED 30 JUNE 2001

We have audited the financial statements on pages 22 to 43. The financial statements provide information about the past financial and service performance of the New Zealand Antarctic Institute and its financial position as at 30 June 2001. This information is stated in accordance with the accounting policies set out on page 38.

Responsibilities of the Board

The Public Finance Act 1989 requires the Board to prepare financial statements in accordance with generally accepted accounting practice which fairly reflect the financial position of the New Zealand Antarctic Institute as at 30 June 2001, the results of its operations and cash flows and the service performance achievements for the year ended 30 June 2001.

Auditor's responsibilities

Section 43 (1) of the Public Finance Act 1989 requires the Audit Office to audit the financial statements presented by the New Zealand Antarctic Institute. It is the responsibility of the Audit Office to express an independent opinion on the financial statements and report its opinion to you.

The Controller and Auditor-General has appointed K J Boddy, of Audit New Zealand, to undertake the audit.

Basis of opinion

An audit includes examining, on a test basis, evidence relevant to the amounts and disclosures in the financial statements. It also includes assessing:

- the significant estimates and judgements made by the Board in the preparation of the financial statements; and
- whether the accounting policies are appropriate to the New Zealand Antarctic Institute's circumstances, consistently applied and adequately disclosed.

We conducted our audit in accordance with generally accepted auditing standards, including the Auditing Standards issued by the Institute of Chartered Accountants of New Zealand. We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatements, whether caused by fraud or error. In forming our opinion, we also evaluated the overall adequacy of the presentation of information in the financial statements.

Other than in our capacity as auditor on behalf of the Controller and Auditor-General, we have no relationship with or interests in the New Zealand Antarctic Institute.

Unqualified opinion

We have obtained all the information and explanations we have required.

In our opinion the financial statements of the New Zealand Antarctic Institute on pages 22 to 43:

- comply with generally accepted accounting practice; and
- fairly reflect:
 - the financial position as at 30 June 2001;
 - the results of its operations and cash flows for the year ended on that date; and
 - the service performance achievements in relation to the performance targets and other measures adopted for the year ended on that date.

Our audit was completed on 17 October 2001 and our unqualified opinion is expressed as at the date.



K J Boddy
Audit New Zealand
On behalf of the Controller and Auditor-General
Christchurch, New Zealand

Board of Directors

Mr Christopher Mace (Chairman)
Dr Maj de Poorter (from Oct.)
Dr Ron Heath
Dr Clive Howard-Williams (until Oct.)
Dr Wendy Lawson (from Oct.)
Mr Bill Mansfield
Mrs Sue Suckling (until Oct.)
Dr Bas Walker

Head Office

Antarctica New Zealand
The New Zealand Antarctic Institute
Administration Building
International Antarctic Centre
38 Orchard Road
Private Bag 4745
Christchurch
New Zealand

Telephone: +64 3 358 0200
Facsimile: +64 3 358 0211
E-mail: info@antarcticanz.govt.nz
WebSite: www.antarcticanz.govt.nz



Antarctica New Zealand

New Zealand Antarctic Institute