

The 2003/2004 Antarctic Research Season

Event K001

7-Nov-03 to 2-Dec-03

McMurdo Ice Shelf

Andrill

Antarctica New Zealand, Christchurch. Jim Cowie, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.cowie@antarcticanz.govt.nz

ANDRILL is an international drilling project following on from the Cape Roberts Project (CRP). Antarctica NZ is the Project operator on behalf of the participating countries. Drilling is not planned to begin till summer season 2005/2006, however, planning and preparatory work is underway. This season the workplan is to continue assessing the CRP equipment that is stored at Scott Base, in particular items of drilling equipment and the units (containers) that made up the utilities section of the CRP Camp. This work will all be done within the immediate environs of Scott Base.

Event K001W

5-Nov-03 to 6-Jan-04

McMurdo Ice Shelf

Continued Geophysical and Site Surveys in Support of ANDRILL targets Beneath the McMurdo Ice Shelf

Department of Geology, University of Otago, PO Box 56 Dunedin. Dr Gary Wilson, Phone: (03) 479 7509 Fax: (03) 479 7527 E-mail: gary.wilson@stonebow.otago.ac.nz

Recent geological drilling, glacial geology and geophysical investigations demonstrate that understanding the evolution of sedimentary basins beneath the McMurdo Ice Shelf is key to deciphering the evolution of the West Antarctic Rift, uplift of the Transantarctic Mountains, and Cenozoic Antarctic ice sheet history. Obtaining stratigraphic records from these basins is the main focus of the multinational ANDRILL initiative. This year we continue a series of geophysical investigations to determine the evolution, extent and internal stratigraphic architecture of these basins as well as the physiographic and oceanographic setting of potential drilling targets. Specific aims of the survey investigations are: 1) To determine the extent, controls and timing on crustal flexure beneath Southern McMurdo Sound; 2) To image the three-dimensional sedimentary fill of basins beneath the McMurdo Ice Shelf; 3) To document the physiographic setting of the McMurdo Ice Shelf (ice profile, **thickness and flow**).

Event K002

27-Oct-03 to 11-Feb-04

Cape Hallett

Latitudinal Gradient Project (LGP)

Antarctica New Zealand, Christchurch. Shulamit Gordon (Project Manager), Phone: (03) 358 0200 Fax: (03) 358 0211 E-mail: s.gordon@antarcticanz.govt.nz

The Latitudinal Gradient Project (LGP) is aimed at increasing the understanding of the coastal marine, freshwater and terrestrial ecosystems that exist along the Victoria Land coastline in the Ross Sea region, and describing potential environmental variability that may occur in the future. Antarctica New Zealand is providing the logistical capabilities

for research camps to be located at specific sites along the Victoria Land coast. Thus, the opportunity to work at particular locations in collaboration with other scientists from various disciplines and National Antarctic Programmes is provided. A camp at Cape Hallett, northern Victoria Land will be operational during the 03/04 and 04/05 summers. The following New Zealand events will be working at Cape Hallett this season: K018, K024, K043, K066, K081, K123, K124 (see individual event entries for research summary).

Event K018

12-Nov-03 to 16-Dec-03

Cape Hallett

Latitudinal Patterns in the Abundance of Ross Sea Meroplankton

School of Biological Sciences, University of Auckland, Private Bag 92019, Auckland.
Dr Mary A Sewell, Phone: (09) 373 7599, ext 83758 Fax: (09) 373 7417, E-mail:
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The pelagic community of the Ross Sea consists of a permanent component (= holoplankton), exemplified by animals such as copepods, and a temporary component which is primarily made up from the larval stages of benthic marine invertebrates and fish (= the meroplankton). To date little attention has been paid to the distribution and abundance patterns of the meroplankton, hampered in part by the inability to identify these larval "types" to the species-level. In the 2003/2004 research we will extend the existing project by taking sampling for marine invertebrate larvae out of McMurdo Sound and into the Ross Sea; allowing a broader based study of Antarctic larval forms. Detailed study of the meroplankton community at Cape Hallett will involve daily quantification of the distribution and abundance of common larval forms identified during K-018. Future research will be conducted along the coastline of Victoria Land under the auspices of the Latitudinal Gradient Project.

Event K021

6-Jan-04 to 14-Jan-04

Royds/Evans

Evaluation of Deterioration of Historic Huts and Terrestrial Biodiversity

Department of Biological Sciences, University of Waikato, Private Bag 3105, Hamilton.
Professor Roberta L Farrell, Phone: (07) 838 4704, Fax: (07) 838 4976, E-mail:
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The Historic Huts of the Heroic Period and their contents in the Ross Dependency are a legacy of human exploration. The extreme polar environment has protected them from rapid decay but not from significant deterioration, both biological and non-biological. K-021 principal goal is to identify cause(s) of the deterioration and obtain a better understanding of the unique degradation processes responsible for the deterioration, with particular attention to microbial and enzymatic decay. Since 1998 K-021 has been actively studying the Historic Huts at Hut Point, Cape Royds and Cape Evans. This basic information is essential if conservation plans for the long-term preservation of the buildings, and other artefacts, are to be successful. K-021 is also determining terrestrial microbial biodiversity, including testing for persistence and viability of fungi, especially those that are psychrophilic and/or capable of mycotoxin production, and bacteria,

including anthrax. K-021 is interested from a global climate perspective in studying the continental area for fungal biodiversity. K021 is a collaboration event with NSF BO- 038 led by Professor Robert Blanchette of University of Minnesota.

Event K024

16-Jan-04 to 3-Feb-04

Cape Hallett

Biodiversity and Performance of Lichens and Mosses

Department of Biological Sciences, University of Waikato, Private Bag 3105, Hamilton.
Professor T G Allan Green, Phone: (07) 838 4225, Fax: (07) 838 4324, E-mail:
greentga@waikato.ac.nz

The terrestrial vegetation will be mapped and described in, and adjacent to, SPA 7 at Cape Hallett. All lichens and mosses detected will be identified in the field or returned to the laboratory for confirmation. A previous visit has located the main areas of vegetation and these will now be recorded in detail and their location mapped by GPS and fitted to a digital land surface. The insects and mites present at each main group of terrestrial vegetation will be sampled and returned for genetic analysis and identification. An analysis will be made of the relationship between type of plant and invertebrate taxa, at present this type of data do not exist. Areas originally photographed in 1964 by Rudolph will be located (a full set of the original slides is now available) and rephotographed to detect change in cover. An area mapped in detail by Rudolph on the outwash area at the foot of the scree will be remapped and changes noted. A copy of the original map is now available which is vastly superior to the published map. These are probably the sites with the longest record for estimating rates of change in the Ross Sea. Damage from a previous visit in 1998 will be sought and rephotographed if found.

Event K027

13-Oct-03 to 20-Jan-04

Cape Bird

Long-Term Impacts of Human Disturbance on Breeding Adélie Penguins

Department of Biological Sciences, University of Waikato, Private Bag 3105, Hamilton.
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Little is known of the long-term consequences of human disturbance on breeding Adélie penguins, despite sharp increases in recreational and research visits to colonies. Sub-colonies of penguins at Cape Bird will be exposed to one of four experimental treatments, representing different levels of human disturbance (i.e. high, moderate, low and no disturbance), to measure affects on key long-term reproductive parameters (e.g. hatching success, fledging success, timing of breeding). Changes in reproductive and stress hormones will also be mapped to identify underlying mechanisms that might explain treatment differences. In addition, we will assess, for the first time in penguins, a non-invasive method of tracking stress and changes in reproductive state using enzyme

immunoassays of faecal samples, by using the technique in conjunction with traditional blood sampling methods. Ultimately, our work will allow us to estimate the degree of human disturbance that is acceptable within colonies, and provide managers with new non-invasive tools (e.g. faecal sampling) to monitor the influences that human visits have on Adélie penguins.

Event K028

2-Jan-04 to 20-Jan-04

Lakes Vanda/Vida

Biodiversity of Terrestrial Arthropods in southern Victoria Land

Department of Biological Sciences, University of Waikato, Private Bag 3105, Hamilton.

Dr Ian Hogg, Phone: (07) 838 4139, Fax: (07) 838 4324,

E-mail: hogg@waikato.ac.nz

This programme will expand on our previous research to fully examine prevailing patterns of biodiversity and phylogenetic relationships for terrestrial invertebrates (e.g. springtails, mites) within the Ross Dependency. It is directly linked with programmes on Antarctic mosses, lichens and DNA in soils, as well as the biodiversity of arthropods in the Canadian Arctic. Traditional, morphology-based, taxonomic approaches for assessing biodiversity are being combined with molecular techniques (mitochondrial DNA, allozyme analyses). These analyses are designed to accurately assess existing levels of biodiversity and to provide information on the origin, evolutionary relationships and present day dispersal patterns of Antarctic invertebrate taxa. We will now target the extensive ice-free regions of the Ascard and Olympus ranges (e.g. Wright Valley, Victoria Valley), in southern Victoria Land, and test the hypothesis that this region is the source of extant populations of arthropods (e.g. *Gomphiocephalus hodgsoni*) in southern Victoria Land. This programme will improve our knowledge of Antarctic biodiversity, and provide critical information for the formulation of Specially Protected Areas within the Ross Dependency.

Event K030

12-Dec-03 to 6-Jan-04

Cape Bird

Molecular Ecology of Antarctic Fauna

Institute of Molecular BioSciences, Massey University, Albany Campus,

Private Bag 102904, Northh Shore mail centre, Auckland.

Professor David M Lambert, Phone: (06) 350 5857 ext 41110, E-mail:

D.M.Lambert@massey.ac.nz

A central prediction of the neutral theory of molecular evolution, is that the rate of evolution (k) is equal to the rate of mutation (μ). A number of recent studies of human mitochondrial DNA have documented extremely high mutation rates that are significantly higher than evolutionary rates. This lack of concordance between empirical observations

and theory has sparked a major controversy. We propose to use a unique biological phenomenon we have discovered in Antarctica, to advance our understanding of this central problem in molecular evolution. Underlying breeding colonies of Adélie penguins (*Pygoscelis adeliae*) are large numbers of serially preserved sub-fossil remains, dating to 13,000 years BP. We have shown that, entombed in frozen penguin bones, is some of the best-preserved ancient DNA yet discovered. Adélie penguins offer a unique opportunity to both directly study molecular evolution, over a geological time scale, and to measure mutation rates in families of living birds. In preliminary research by this group, we have shown that it is possible, for the first time, to use a combination of modern and ancient samples to make precise estimates of evolutionary rates. We aim to test the central predication of neutral theory by comparing evolutionary and mutation rates, using our unique discovery.

Event K034

17-Nov-03 to 13-Dec-03

Cape Bird

Corticosterone and Stress Responses in Adélie Penguins.

Institute of Veterinary, Animal & Biomedical Sciences, Massey University, Private Bag 11-222, Palmerston North. Dr John F Cockrem, Phone: (06) 350 4483, Fax: (06) 350 5636, E-mail: J.F.Cockrem@massey.ac.nz

Corticosterone is the major adrenal steroid hormone in birds. Corticosterone secretion increases when a bird perceives a situation to be threatening, and in response to metabolic stimuli. Corticosterone has a range of actions that help animals adjust to stressful situations, such as increasing blood glucose levels and promoting feeding behaviour. Corticosterone can also have negative effects such as inhibiting reproduction and inhibiting the immune system. We have recently started a research programme to investigate the factors that affect corticosterone secretion and stress responses in Adélie penguins at Cape Bird on Ross Island. We will continue our studies of how penguins respond to people and to natural predators. If funding is obtained from the NSF then we will also begin an international collaborative study of variation in corticosterone responses to stress in relation to individual variation in reproductive success in Adélie penguins. These studies will provide novel data on how wild animals perceive people and predators, and on the significance of marked differences between individual birds in their responses to stressors. The results will also be relevant to determining appropriate distances for the approach of tourists to Adélie penguin colonies.

Event K042

Cape Roberts/K049

Cape Roberts Tide Gauge

Antarctic Research Centre, Victoria University of Wellington, PO Box 600, Wellington. Mr Alex R Pyne, Phone: (04) 463 5396, Fax: (04) 463 5186, E-mail: Alex.Pyne@vuw.ac.nz

The Cape Roberts Tide gauge was initially established in 1990 by VUW to support marine geological investigations and the Cape Roberts Project drilling operations in the last ten years. A permanent installation has been established and has continued operating

since 1990 providing the longest tidal record for the Ross Sea region of Antarctica. The operation of the tide gauge has encouraged USGS and Ohio State University workers to establish Cape Roberts as a primary datum for their GPS stress and deformation control network in South Victoria Land. In 2000 LINZ in partnership with USGS have established a continuously recording GPS station at Cape Roberts that will also require continued tidal records. LINZ bathymetric survey commitments in the Ross Sea (C. Adare and C. Hallet) require a linked Ross Sea tidal datum and the Cape Roberts Tide gauge data recording was modified in 2000/2001 for this purpose. New drilling initiatives proposed in Granite Harbour will also require continued tidal data recording. In 2003/2004 minor maintenance and annual calibrations will be required. New meteorological sensors may also be installed on the existing mast if finances allow. The installation will be serviced by VUW, supported by LINZ and data archived by LINZ.

Event K043

10-Nov-03 to 16-Dec-03

Cape Hallett

Antarctic Sea Ice, Algal Productivity and Global Climate Change

School of Biological Sciences, Victoria University of Wellington, PO Box 600, Wellington. Dr Ken Ryan, Phone: (04) 472 1000 ext 8107, Fax: (04) 463 5331, E-mail: ken.ryan@vuw.ac.nz

Sea ice exerts a unique and overwhelming influence on marine ecosystems in the Antarctic. Each year, approximately 19 million km² of Antarctic sea ice melts, creating conditions for a huge influx of algal biomass into the food web of the Southern Ocean. Any reduction in sea ice cover caused by global warming will alter the balance of this productivity and will modify the dynamics and interactions of the whole marine ecosystem. This study will provide ground truth data of total primary productivity and biodiversity in the region, and will be the first to assess the effect of global climate change on primary productivity in Antarctic coastal ecosystems. The relationship between the extent of ice cover and total primary production along an extensive north-south transect of the western coast of the Ross Sea, will be used to predict future scenarios of reduced ice at sites further south. The work will form an integral part of the proposed "Latitudinal Gradient Project" and once completed, will provide a wide range of climatic conditions and a unique opportunity to predict future changes under various climatic models. In 2003/2004 and 2004/2005, studies will be undertaken in the first of the LGP sites at Cape Hallett.

Event K049

17-Oct -03 to 16-Dec-03

Evans, Piedmont/Erebus

NZ ITASE – Climate Variability Along the Victoria Land Coast

Antarctic Research Centre, Victoria University of Wellington, PO Box 600, Wellington.
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International polar ice coring programmes (e.g. GISP and Vostok) have provided powerful new insights into Earth's climate back 400,000 years from the diverse inventory of atmospheric information stored both within the ice and trapped air bubbles. To understand and predict the local response to anthropogenically induced global warming seen in these "global" ice cores, the focus of ice core research in Antarctica is moving to the acquisition of high-resolution regional paleoclimatic archives of annual-scale that overlap with and extend the instrumental records of the last 40 years back several thousand years. This has been a key motivation behind the US-led International Transantarctic Scientific Expedition (ITASE) of which New Zealand is now a member. The project's objective is to recover a series of ice cores from glaciers along a 14-degree latitudinal transect of the climatically sensitive Victoria Land coastline and thereby directly contribute a critical dataset to ITASE.

Event K051

6-Jan-04 to 6-Feb-04

Miller Glacier area

Paleozoic Tectonics of the Gondwana Margin

Department of Geological Sciences & Gateway Antarctica, University of Canterbury, Private Bag 4800, Christchurch. Professor J D Bradshaw, Phone: (03) 366 7001 ext 7779, Fax: (03) 364 2769, E-mail: j.bradshaw@geol.canterbury.ac.nz

During the Cambro-Ordovician period, Victoria Land and New Zealand were parts of the active margin of the Gondwana continent. A picture is emerging of an active continental margin of Andean type and the accretion of one or more intra-oceanic arc terranes between 500 and 485 Ma. This points to the presence of two or more contemporaneous subduction zones. In northern Victoria Land, the Bowers terrane was accreted in the Late Cambrian. In southern Victoria Land changes in composition of basement granites in the Dry Valleys have been attributed to the arrival of a similar exotic terrane. The latter hypothesis can be tested by examining clasts in the Sperm Bluff conglomerate (Taylor Group, Beacon Supergroup) in the Dry Valleys area. The clasts are of lithologies not found in southern Victoria Land and a combined petrological, geochemical and geochronological study of sedimentary and igneous clasts would establish their provenance. The results would contribute to the understanding of the history and dynamics of the Gondwana margin and the Ross Orogen, the provenance and paleogeography of the Taylor Group basin, and the basement of the Victoria Land basin.

Event K053

5-Nov-03 to 23-Jan-04

McMurdo Ice Shelf

Ice Shelf Sensitivity and Change

Department of Geography & Gateway Antarctica, University of Canterbury, Private Bag 4800, Christchurch. Dr Wendy Lawson, Phone: (03) 364 2920, Fax: (03) 364 2907, E-mail: w.Lawson@geog.canterbury.ac.nz

Ice shelves are potentially highly sensitive indicators of climate change, because they have a limit of thermal viability that, when exceeded, leads to their collapse. The pattern of recent dramatic collapse of ice shelves on the Antarctic Peninsula has been closely linked to the pattern of regional climate change in the last 50 years, and evidence indicates that collapse has occurred at other periods in Earth history that were not influenced by anthropogenic factors. However, a greater understanding of ice shelf response processes is required before their behaviour can accurately be interpreted in terms of external change. The aim of this research is to begin an examination of ice shelf response processes by establishing the modern dynamics of the McMurdo Ice Shelf. The McMurdo Ice Shelf has been chosen as a generic site for systematic research into ice shelf response, and also as an ice shelf that is subject to local – as well as global – human impacts. In addition, the research fills an identified gap in knowledge that affects the understanding of interaction of ice between East and West Antarctica.

Event K055

16-Jan-04 to 30-Jan-04

Arrival Heights

Dynamics and Ionisation in the Antarctic Middle Atmosphere

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The goal of the programme is to study the seasonal and intra-seasonal behaviour of the wave-driven circulation, particularly its dependence on major disturbances from the troposphere and stratosphere which result in the transport of energy and momentum by waves to the higher altitudes. This transport generates forces that drive horizontal and vertical air circulations. For example, the downward transport of stratospheric air explains the warm polar winter stratopause and summer air moving up into the mesosphere, creates the intensely cold summer mesopause. Thus, waves modify and drive the transport and mixing of much of the middle atmosphere. The programme described is based on continuous monitoring of winds in the middle atmosphere at altitudes of 60-100km using a ground-based radar at Scott Base. However, the measurement of these large-scale phenomenon benefits considerably from co-operative observations by our own radar near Christchurch, and by US colleagues at the South Pole, Arrival Heights and Tekapo. We also use satellite data from the region between Antarctica and New Zealand. Part of our programme is directly in support of Antarctic

logistics by providing ionospheric data used in forecasting HF communication propagation conditions.

Event K056

31-Oct-03 to 3-Feb-04

Skelton Gl./Terra Nova Bay

Influence of Moisture on Rock Weathering Processes

Geography Department, University of Canterbury, Private Bag 4800, Christchurch. Ms Christine Elliott, Phone: (03) 366 7001 ext 7913, Fax: (03) 364 2907, E-mail: c.elliott@geog.canterbury.ac.nz

The primary objective of the proposed research is to improve our understanding of rock weathering processes, and their effectiveness, along a moisture gradient on the Victoria Land Coast, Antarctica. An improved understanding of both the processes involved and the rate at which rock weathering occurs will contribute to our knowledge of landscape evolution, soil development as well as some possible effects of climate change. Although the emphasis is on physical rock weathering processes, investigations of both biological and chemical weathering will take place. There are two major components to the research. The first is to identify the individual weathering process (or processes) that operate along such a moisture gradient and the second is to estimate the rates of rock breakdown. Four locations have been chosen to characterise the moisture gradient, Victoria Valley, Marble Point, Terra Nova Bay, Skelton Glacier. Investigations at Victoria Valley and Marble Point were carried out during the first year of the research in 2002/2003. Rock strength and albedo, as well as precipitation, surface and subsurface rock temperatures and moisture content will be measured. Rock samples will be collected and submitted to simulated climatic cycles in an environmental cabinet to estimate weathering rate.

Event K057

17-Oct-03 to 9-Dec-03

SB Local

Thermal Sensitivity of Swimming Performance in Antarctic Fish

Department of Zoology & Gateway Antarctica, University of Canterbury, Private Bag 4800, Christchurch. Associate Professor William Davison, Phone: (03) 364 2029, Fax: (03) 364 2024, E-mail: bill.Davison@canterbury.ac.nz

Typical of Antarctic fish, *Pagothenia borchgrevinki* is extremely stenothermal, with a temperature range of -1.8 to 5°C . Burst swimming in this fish appears to be temperature independent, while sustained swimming is very temperature dependent. The aim of this project is to examine thermal plasticity and sensitivity of sustained swimming, with particular reference to cardiac performance at elevated temperatures. Fish will be acclimated to -1 and $+4^{\circ}\text{C}$ and differences in swimming performance will be measured. This will be achieved by measuring: Ucrit (maximum sustained swimming performance), cardiac output, blood pressure and heart rate, oxidative and anaerobic enzymes, and the performance of isolated hearts.

Event K061

26-Nov-03 to 27-Jan-04

Allan Hills/Carapace Nunatak

Explosive Intensity of Pre-Flood Basalt Eruptions

Geology Department, University of Otago, PO Box 56, Dunedin.

Dr James D L White, Phone: (03) 479 7519, Fax: (03) 479 7527, E-mail:

j.white@otago.ac.nz

Research spanning more than 3 decades has yet to yield a compelling explanation of the fundamental nature and implications of widespread volcanoclastic deposits formed in association with emplacement of the Ferrar Dolerites and Kirkpatrick Flood basalts. Evidence is accumulating in support of a model developed from Coombs Hills which interprets some of the volcanoclastic deposits as remnants of very large vent complexes associated with explosive eruptions. At Coombs Hills itself, there is little indication of how such an eruption is expressed beyond the source-vent complex. Reconnaissance observations in southern Allan Hills provide tantalizing evidence for significant dispersal from intense eruptions, including large and many-layered accretionary lapilli similar to those developed in association with some pyroclastic flows. These lie within a few-metres-thick bed of debris that has consistent characteristics across many kilometres and includes explosively ejected ballistic blocks. Basalt is rich in sulphur, and explosive basaltic eruptions modify regional weather; if eruptions are sufficiently intense to pierce the stratosphere, global effects may result. This programme will assess the nature of the Allan Hills deposits and their relationship to the large vent complex at Coombs Hills. It will also examine possible far-field climatic and landscape modifying effects of an eruption of the indicated size and style.

Event K062

Skelton Glacier/Royd Society Range

K001

Magmatic and Metamorphic Evolution of the Ross Orogen, Transantarctic Mountains

Geology Department, University of Otago, PO Box 56, Dunedin.

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The Neoproterozoic to Ordovician Ross Orogeny occurred by accretion and subjection of the Paleo-Pacific ocean lithosphere beneath the edge of the East Antarctic craton. The timing of magmatic events in southern Victoria Land has been determined in previous programmes by U-Pb dating of zircons (551 to 488 Ma) from individual plutons between the Dry Valleys and the Darwin Glacier. Attempts to date the earlier metamorphic climax have been unsuccessful, in part due to thermal overprinting by later igneous intrusions. The programme suggested here is to extend a pilot study, undertaken this year, involving the ELA-ICP-MS microbeam dating of detrital zircons in metasediments from the Transantarctic Mountains. Ages of detrital zircons are not reset by metamorphism and can be used to determine the minimum age of sedimentation and hence the maximum age of subsequent metamorphism. The spectrum of detrital zircon ages is also useful for provenance studies and can be used to reconstruct the paleogeography, and evaluate the status of exotic terranes, within the Ross Orogen.

Event K063**10-Oct-03 to 13-Dec-03****Turtle Rock****Effects of Variation in Marine Productivity on Reproduction in Weddell Seals**

Department of Zoology, University of Otago, PO Box 56, Dunedin.

Dr Lloyd Davis, Phone: (03) 479 7654, E-mail: adelie@stonebow.otago.ac.nz

The fate of populations of marine predators is ultimately determined by the oceanic processes that influence the spatial and temporal distribution of primary productivity. This study has two components. We will assess the relationship between foraging performance of Weddell seals breeding in McMurdo Sound and a range of oceanographic parameters encountered during their winter foraging in the Ross Sea. Oceanographic variables to be recorded include sea surface temperature, productivity and bathymetry. We will then link their over-winter performance to their breeding performance in the subsequent breeding season. We will determine how the winter diet, mother's body condition, and rate of energy transfer during lactation related to pup body condition and the ontogeny of disease resistance. Ultimately, we will assess how these factors interact and if they are determinants of pup survival within the first year. These data will help us understand how Antarctic predators will respond to changes in the distribution of marine resources as a result of global climate change or commercial fisheries activity.

Event K064**3-Nov-03 to 2-Dec-03****Victoria Upper/Wright Lower****Basal Ice and Substrate Deformation at Subfreezing Temperatures**

Department of Geography, University of Otago, PO Box 56, Dunedin.

Dr Sean Fitzsimons, Phone: (03) 479 8786, Fax: (03) 479 9037, E-mail: sjf@geography.otago.ac.nz

Investigation of glaciological and geological processes that occur beneath glaciers that have basal ice temperatures significantly below freezing ($<-10^{\circ}\text{C}$). The research is an extension of previous work that has focussed on the composition, deformation and mechanical behaviour of basal ice. Although this previous work has yielded a detailed understanding of the composition and behaviour of basal ice we have yet to understand the compositional signature and deformation behaviour of aprons that form at cliffed glacier margins. The objectives of the research are: 1. To monitor apron deformation, basal ice deformation and surface strain simultaneously in order to understand the role of apron in the behaviour of the glacier terminus; 2. To determine the isotopic and solute composition of the apron ice in order to understand the extent to which melting and refreezing play a role in apron composition and; 3. Use the deformation and composition data to evaluate to what extent the apron ice contributes to the formation of basal ice.

Event K066**10-Nov-03 to 18-Dec-03****Cape Hallett****Latitudinal Gene Drift in Ross Sea Organisms**

Department of Biochemistry, University of Otago, PO Box 56, Dunedin.

Dr Craig Marshall, Phone: (03) 479 7570, Fax: (03) 479 7866, E-mail:
craig.marshall@otago.ac.nz

Marine and terrestrial organisms are likely to have been exposed to quite different environments since Antarctica separated from the rest of Gondwana. Marine systems are well mixed and allow easy movement of individuals from place to place. Despite this, notothenioid fish dominate the Antarctic fish fauna and form a species flock implying that some mechanism must exist to isolate individual populations. Marine invertebrates such as echinoderms and pycnogonids seem to be less diverse and more similar to species found in the adjoining landmasses. In contrast, land organisms inhabit ice-free refugia that comprise only a few percent of the area of the continent. Animals from these areas may show much stronger regional variation and a different pattern on speciation. In this programme, we will collect material from both marine and terrestrial animals to determine their phylogenetic histories.

Event K068

13-Oct-03 to 4-Dec-03

SB local

Photolyase Mediated DNA Repair in the Embryos and Larvae of Antarctic Invertebrates Exposed to Ultraviolet Radiation (UV-R)

Department of Marine Science, University of Otago, PO Box 56, Dunedin.

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Research conducted in 2002 investigated the optical properties of sea ice and the effects of UV-R on the planktonic larval stages of the echinoid (*Sterechinus neumayeri*). We aim to further this research in 2003/2004 by (1) addressing the key and related question of DNA repair, while (2) continuing our measurements of the optical properties of the annual sea ice, underlying water column, and in situ UV-R on DNA damage (production of cyclobutane pyrimidine dimers, CPDs) in embryos and larvae of a variety of Antarctic invertebrates in the laboratory and field, and specifically examine the photorepair capabilities (by the enzyme photolyase) of these important planktonic life-history stages. We will look at the differential expression of the photolyase gene and its products at the molecular level and conduct experiments to examine the thermal tolerance of this enzyme in these stenothermal invertebrates. Photorepair in Antarctic species will later be compared with temperate species that are phylogenetic and ecological analogs.

Event K069

9-Jan-04 to 16-Jan-04

Arrival Heights

Monitoring Magnetosphere-Ionosphere Coupling and Space Weather at High Latitudes

Professor Brian Fraser & Professor Richard Dowden

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Department of Physics, University of Otago, PO Box 56, Dunedin. Professor Richard Dowden

This project will provide a better understanding of the dynamics and volatility of the near-Earth space, a plasma region populated by ionised gas embedded in the geomagnetic field. The dynamic behaviour of this plasma system, now referred to as “space weather” is of vital importance to the operation of modern technological systems, and its effects are most apparent at high latitudes, e.g. the aurora. Space weather can disrupt the operation of satellites, radio navigation and power distribution systems. The results of this study will provide important input parameters to global magnetospheric circulation models currently under development for space weather forecasting. In particular, it will study the dynamics and topology of the southern high latitude cusp, and polar cap, geomagnetic field regions open to direct solar influence. Ultra-low frequency (ULF) waves will be used as tracers in the study of high latitude plasma dynamics and magnetosphere-ionosphere coupling. Scott Base magnetometer and optical imager data, in conjunction with multi-point and multi-instrument observations from Australian manned bases and USA-UK polar cap automatic geophysical observatories (AGOs), will provide the basic data set for the study.

Event K073

13-Jan-04 to 20-Jan-04

SB Local

Examining the Values of Visitors to the Ross Sea Region

Social Sciences, Tourism & Recreation Group, Lincoln University, PO Box 84, Canterbury. Dr Gary Steel, Phone: (03) 325 3838 ext 8784, Fax: (03) 325 3857, E-mail: steelg@lincoln.ac.nz

Everyone involved in Antarctic matters (Science, Policy, Tourism), appear to have differing anecdotal opinions as to whether visitors simply create more than just negative impact to the Antarctic environment. Empirically, what are the values held by visitors to the Antarctic? In what manner do such values change over the time of the experience? If values change what effect might this have on Antarctic conservation or be of other benefit to the Antarctic continent? This research examines such questions with regards to those outside the traditional Antarctic roles of science and logistics, the non-traditional visitors who come into physical contact with the continent. Methodologically, this research will examine the non-traditional visitor over three phases of their experience with Antarctica: (1) anticipation of their visit; (2) during their on-site visit; and (3) upon their return home after the visit. By using a three-part methodology with different samples of non-traditional visitors this research can examine a cycle of value change and compare groups of visitors through this cycle. Thus possibly revealing why certain groups changed more or less, and if so why.

Event K080

07-Nov-03 to 12-Nov-03

NIWA Antarctic Field Training

NIWA, PO Box 14-901, Kilbirnie, Wellington. John Mitchell, Phone: (04) 386 0374, Fax: (04) 386 2153, E-mail: j.mitchell@niwa.co.nz
Antarctic Field Training for NIWA personnel prior to Antarctic voyage of R.V. Tangaroa.

Event K081

15-Oct-03 to 27-Jan-04

Cape Hallett, Bratina, C Evans

Antarctic Aquatic Ecosystems (Inland)

NIWA, PO Box 11-115, Hamilton. Dr Ian Hawes, Phone: (07) 856 7026, Fax: (07) 856 0151, E-mail: i.hawes@niwa.co.nz

This programme will provide information on Antarctica's inland aquatic ecosystems, focusing on ponds and lakes. It will determine how climate-related environmental processes (temperature, wind, irradiance) influence the physical and chemical characteristics of aquatic habitats, and how these characteristics in turn affect the diversity and productivity of biological communities. We will develop climate-driven models that describe the physical and chemical processes within aquatic ecosystems. We will determine the structure, diversity and dynamics of the biological communities within these systems, and develop a mechanistic understanding of the linkages between biology, chemistry and physics. This includes linking simple models describing how key biological processes (photosynthesis, respiration, nutrient transformations) within the dominant microbial communities are affected by specific physical and chemical factors. Initial work will focus on sites in the Wright and Victoria Valleys and the McMurdo Ice Shelf. As the programme develops over the next five years we will use natural gradients across the latitudinal range of the Ross Sea, as part of the Latitudinal Gradient Programme, to provide a range of conditions within which to further develop and test these models, with an ultimate goal of addressing the impacts of climate variability on aquatic ecosystems.

Event K082

24-Oct-03 to 15-Feb-04

Cape Evans, TNB

Antarctic Aquatic Ecosystems (Coastal)

NIWA, PO Box 11-115, Hamilton. Vonda Cummings, Phone: (07) 856 7026, Fax: (07) 856 0151, E-mail: v.cummings@niwa.co.nz

This programme will provide fundamental information on the structural and functional biodiversity of Antarctic coastal ecosystems. It deals with the climate-related environmental processes that influence the community dynamics and spatial structure of populations, and hence the potential for regional climate variability to impact on ecosystem structure and function. We use natural gradients in environmental conditions and productivity within the latitudinal range of the Ross Sea to address how the structure, diversity, trophic interactions and productivity of communities relate to site-specific physical variables. We will determine the source and magnitude of primary production, patterns of resource utilisation by macrobenthos and the biodiversity of benthic communities over different spatial scales. Characterising the structure and function of benthic communities and its link to site-specific productivity is essential to an improved

understanding of Antarctic ecology and creates a baseline for distinguishing natural environmental variability, occurring over short ecological time and space scales, from larger scale phenomena such as global warming.

Event K085

20-Aug-03 to 6-Feb-04

Arrival Heights

Drivers of Global Change in the Antarctic: Atmospheric Remote-Sensing

NIWA, Private Bag 50061, Omakau. Dr Stephen W Wood, Phone: (03) 440 0426, Fax: (03) 447 3348, E-mail: s.wood@niwa.co.nz

This research investigates the Antarctic atmosphere's role in global change, its response to that change, and its impact on its surroundings. Springtime Antarctic ozone depletion is due to anthropogenic change in the stratosphere. This depletion has impacts on UV radiation in the Antarctic and, due to atmospheric circulation, at places in the mid-latitudes such as New Zealand in the summer. Although ozone-destroying chlorine has begun to decline, ozone recovery may be delayed 1–2 decades due to climate change. Testing model-based predictions with Antarctic observations will give early insight into ozone recovery. Changes in greenhouse gases, including ozone, affect the radiative balance of the atmosphere in ways that are not yet fully understood. The Antarctic provides a unique opportunity to determine global trends of atmospheric trace gases at sites isolated from anthropogenic sources. We propose to continue our programme of ground-based remote sensing of ozone and other important trace gases in the atmosphere at Scott Base and Arrival Heights. This involves continued collaboration with overseas groups from Denver, New York and Heidelberg, Germany.

Event K087

20-Aug-03 to 30-Jan-04

Sampling Intercontinental

Drivers of Global Change in the Antarctic: Atmospheric Air Sampling

NIWA, PO Box 14 901, Wellington. Mr Gordon Brailsford, Phone: (04) 386 0308, Fax: (04) 386 2153, E-mail: g.brailsford@niwa.co.nz

The research in this programme is designed to investigate fundamental global change issues in the atmosphere. We propose to continue our clean air sampling programme at Arrival Heights. The concentration and isotopic data derived from these collections allows us to improve our understanding of the evolution of non-CO₂ greenhouse gas source–removal budgets using, three-dimensional transport and chemistry models to relate variations in growth rate to changes in natural and anthropogenic sources and removal rates. The use of ¹⁴CO as a tracer is providing a means of determining long-term trends in the oxidative capacity of the atmosphere. In addition we will continue our investigations into the role of the Southern Ocean in the removal of atmospheric CO₂. Over the past few years we have measured CO₂ at the ocean surface and at altitude between New Zealand and Ross Island, using the difference to infer uptake by the ocean. A continued collaboration with the Max Planck Institute, Heidelberg, Germany will allow the measurement of hydrogen isotopes in water particles that are associated with polar stratospheric cloud formation and degradation.

Event K089**9-Jan-04 to 16-Jan-04****Arrival Heights****Climate Data Acquisition – Scott Base and Arrival Heights, Antarctica**

NIWA, PO Box 8602, Christchurch. Mr Andrew Harper, Phone: (03) 343 7890, Fax: (03) 343 7891, E-mail: a.harper@niwa.co.nz

The goal of this programme is to obtain a high-quality continuous climate record for Scott Base and Arrival Heights in Antarctica, and archive it in NIWA's publicly accessible climate database. Scott Base is one of 47 reference climate stations for the New Zealand region managed by NIWA, and climate observations (wind speed and direction, air temperature, relative humidity, barometric pressure, global solar radiation, diffuse solar radiation and direct solar radiation) are recorded there daily. This climate record began in 1957 and is one of the longest continuous records in Antarctica. Wind speed and direction, air temperature, relative humidity and global solar radiation are now also recorded at Arrival Heights. The measurements are needed for characterising the local climate and state of the environment, identifying climate variations and changes, and in research on climate-sensitive processes and ecosystems. This programme now also includes the recently installed sea level recorder at Scott Base.

Event K101**31-Oct-03 to 30-Jan-04****TNB / David Glacier****Evolution of the Transantarctic Mountains - SeismoTectonics of the David Glacier Region**

Institute of Geological & Nuclear Sciences Ltd, PO Box 30-368, Lower Hutt 6315.
Dr Stephen Bannister, Phone: (04) 570 4678, Fax: (04) 570 4603, E-mail: s.bannister@gns.cri.nz

Our proposed research will directly investigate the present-day seismo-tectonics of the region around David Glacier, in the Transantarctic Mountains (TAM), in order to document the present-day significance of the inferred David Glacier Lineament for the plate tectonic setting of the western Ross Sea region and the evolution of the TAM. The work, to be carried out jointly with Dr Andrea Morelli from the Italian Antarctic Programme, will involve placing a targeted passive array of 8 seismometers around the Lineament, to record local seismic events over a period of 3 months during the 2003/2004 summer season. The proposed work will build on results from (1999/2000) seismological investigations, and terrestrial geological mapping investigation work from the 2002/2003 season. Although the Transantarctic Mountains have previously been regarded to be relatively aseismic, a number of earthquakes have now been located using new permanent seismograph stations and temporary seismograph arrays. In particular a large number of seismic events have been located in the David Glacier region, with a ESE-WNW distribution. Our hypothesis is that these events represent tectonic events associated with a major cross-TAM crustal lineament, the David Glacier Lineament.

Event K103

16-Jan-04 to 20-Feb-04

NBP - northern Victoria Land

Mapping Glacio-Marine Sequences in the eastern Victoria Land Basin

Institute of Geological & Nuclear Sciences Ltd, PO Box 30-368, Lower Hutt.

Dr Stuart Henrys, Phone: (04) 570 4812, Fax: (04) 570 4603, E-mail:

s.henrys@gns.cri.nz

To test the hypotheses that the Antarctic Ice Sheet behaved dynamically in the warmer past (35 to 15 million years ago) we have examined processes of environmental change caused by local ice margin and sea-level oscillations at drill-core scale. In our successful Marsden funded application, we have argued that seismic reflection data is required to provide essential regional coverage in the western Ross Sea for resolving the history of ice margin and water depth changes implied by drill hole data. US scientists, working on the geological history of McMurdo Sound, have been funded by the National Science Foundation's Office of Polar Programs for further seismic data surveys in the western Ross Sea and invited our participation. We wish to take advantage of this opportunity to obtain seismic lines directly over the Cape Roberts drill sites in both strike and dip directions and a kilometre on either side. The new data will double the spatial and temporal frequency of existing seismic data and provide improved geometric resolution.

Event K110

19-Dec-03 to 6-Feb-04

Dome C via TNB

Collaborative Project with French Antarctic Programme

Institute of Geological & Nuclear Sciences Ltd, PO Box 30-368, Lower Hutt 6315.

Dr Uwe Morganstern, Phone: (04) 570 4678, Fax: (04) 570 4603, E-mail:

u.morganstern@gns.cri.nz

This Marsden funded research programme, in collaboration with the European Project for Ice Coring in Antarctica (EPICA) science team, aims to obtain deep snow pit and ice core samples at Dome Concordia. The programme seeks to refine and establish the newly developed silicon-32 (³²Si) technique for dating glacier ice core climate archives covering the past millennium. After determining more precisely the key properties of ³²Si, namely its half-life and its temporal and spatial deposition rate, the technique will be calibrated against previously dated ice cores, then applied to carefully selected ice cores from various low-mid latitude glaciers to study regional patterns of natural and anthropogenically induced climate changes and related atmospheric mixing processes.

Event K122

10-Nov-03 to 30-Jan-04

Cape Bird

Adélie Penguin Population Dynamics

Landcare Research, Private Bag 6, Nelson. Dr Peter Wilson. Phone: (03) 548 1082, Fax: (03) 546 8590, E-mail: wilsonpr@landcareresearch.co.nz

Currently we are investigating the mechanisms that control population size and colony distribution of Adélie penguins (*Pygoscelis adeliae*), a bioindicator of ecosystem change in Antarctica. Thus far we have determined: (1) the relative importance of resources that constrain colony growth – amount of nesting habitat vs access to food; (2) aspects of

natural history affected by exploitative or interference competition among neighbouring colonies – breeding and foraging effort; (3) climatic factors, especially sea-ice extent and concentration; and (4) behavioural mechanisms that influence the geographic and genetic structure of Adélie populations. Only now are we in a position to determine that demographic mechanism of colony growth (or decline) in relation to climate change and its impact on the multiple factors driving the life cycles of Antarctic marine organisms. In collaboration with a US team we propose to test the hypotheses: (1) demographic parameters do not differ among the colonies in the southern Ross Sea; (2) timing of breeding differs at the colonies depending on environmental factors; (3) the northern position of the wintering area is critical to overwinter survival. Our research will contribute to understanding the consequences of climate-mediated changes on the demographic processes among top predators in the Southern Ocean.

Event K123

12-Dec-03 to 27-Jan-04

Granite Harbour, Cape Hallett

Environmental Protection of Ice-Free Regions of Antarctica

Landcare Research New Zealand Ltd. Dr Jackie Aislabie, Phone: (07) 858 3700, Fax: (07) 585 4964, E-mail: AislabieJ@Landcareresearch.co.nz

As a signatory to the International Antarctic Treaty, New Zealand plays a key role in developing environmental protection measures for Antarctica. Ice-free regions of Antarctica are the focus of increasing human activity and infrastructure, and therefore are vulnerable to impacts. Consequences of human activities on ice-free regions include local pollution from hydrocarbon spills and landscape modification for construction and roading. This programme supports environmental protection of ice-free areas through the development of environmental domains to provide a robust spatial framework for environmental management and research in the Ross Sea region of Antarctica. This framework builds on the Ross Sea region soils database, and is underpinned by increasing knowledge and understanding of soils, including soil distribution, climate and biodiversity, and the impacts of human activities. This season we expand the geographic range of our field activities to include ornithogenic soils of Cape Hallett in Northern Victoria Land under the auspices of the Latitudinal Gradient Project.

Event K124

9-Jan-04 to 27-Jan-04

Cape Hallett

Evolution and Dispersal of Algae Along a Latitudinal Gradient

Manaaki Whenua – Landcare Research, PO Box 69, Gerald Street, Lincoln.
Dr Phil Novis, Phone: (03) 325 6701 ext 2511, Fax: (03) 325 2418, E-mail: NovisP@LandcareResearch.co.nz

The Latitudinal Gradient Project (LGP) aims to identify and characterise the evolution of key organisms, with a view to determining their responses to environmental change. Algae are the dominant primary producers in the Ross Sea region, and are therefore “key organisms”. I propose to assess the genetic relationships of non-marine algal populations along a latitudinal gradient from the Ross Sea sector, a subantarctic island, and alpine habitats in New Zealand. Knowledge of the diversity, origin and evolution of non-marine

algae in Antarctica is lacking. Although it is widely assumed that cosmopolitan species have dispersed great distances to Antarctica by Aeolian means, this has never been conclusively demonstrated. Gene sequencing and DNA fingerprinting are powerful tools in the study of evolutionary biology, and will be combined with traditional methods to assess algal relationships along the gradient – the “genetic isolation” of populations – and show the extent of recruitment and dispersal between them. Because latitudinal and altitudinal variation is viewed as a surrogate for climate change, results may also show how Antarctic algal communities will be selected in response to climate change in the future, and assist interpretation of results by other scientists in the LGP.

Event: K131

20-Aug-03 to 7-Nov-03

McMurdo Sound traverse

Sea Ice and Southern Ocean Processes

Industrial Research Ltd. Dr Timothy G Haskell, Phone: (04) 569 0000, Fax: (04) 569 0754, E-mail: t.haskell@irl.cri.nz

A consortium made up of three NZ Universities, international collaborators and IRL proposes a programme of research ‘Sea Ice and Southern Ocean Processes’ that is of direct relevance to southern hemisphere climate and the fisheries of interest to New Zealand. This is being achieved by research on two complementary and intersecting objectives: 1. Thermal properties and growth processes in sea ice, which focuses on aspects of sea ice that determines how it controls the relationship between the Ocean beneath and the atmosphere above. 2. Ocean wave/sea ice linkages relevant to climate, where the aim is to discover how sea ice is changed by waves, with particular notice taken of spatial variability and abrupt transitions. Specific research techniques include the measurement and understanding of the physical properties of sea ice using conventional and novel techniques including: NMR; thermal conductivity; optical characterisation; electrical resistance and the measurement and modelling of wave propagation in heterogeneous media.

Event: K141

TBC

SB Local

Malaysian Antarctic Programme

TBC

Supporting the Malaysian Antarctic Programme.

Event: K150

Post-Graduate Research Scholarships

Antarctica New Zealand, Christchurch. Dr Dean Peterson, Phone: (03) 358 0200, Fax: (03)358 0211, E-mail: d.peterson@antarcticanz.govt.nz

The three scholarships are:

a) **Sir Robin Irvine Scholarship**: awarded to Penelope Clendon from the University of Canterbury to identify processes controlling the production of meltwater on the McMurdo Ice Shelf and to predictively map melting. [Associated with K053]

b) **New Zealand Post Scholarship**: awarded to Patrick Maher from Lincoln University to study the values and experiences held by visitors to Antarctica and how these values change with these experiences. [Associated with K073]

c) **Kelly Tarlton's Scholarship**: awarded to Angela McGaughran from Waikato University to describe patterns of biodiversity for terrestrial invertebrates (e.g. springtails and mites), from study sites in the Victoria and Wright Valley's using traditional, morphology-based, taxonomic and molecular approaches. [Associated with K028]

Event: K200

17-Dec-03 to 6-Jan-04

Windless Bight

University of Canterbury Graduate Certificate in Antarctic Studies

Gateway Antarctica, University of Canterbury, Private Bag 4800, Christchurch.

Professor Bryan Storey.

The goal of the Graduate Certificate in Antarctic Studies is to engage participants in a critical examination of the contemporary scientific, environmental, social and policy issues and debates facing the Antarctic region. The Antarctic field component incorporates eleven days of field studies at Scott Base and its environs. Students will complete Antarctic Field Training, participate in base activities and undertake supervised studies related to geology, ecology, art, glaciology and meteorology.

Event: K210

5-Dec-03 to 11-Dec-03

SB Local/Huts

Secondary Schools Initiative in Antarctica Programme

Waitaki Boys High School, Oamaru. Paul Baker

To work in the curriculum area of history, art and conservation science with the following output goals: - Antarctic heritage trail in Oamaru - Exhibition on Antarctica and Oamaru and the work of Antarctica New Zealand - Information board at Oamaru Harbour to study the heroic era huts in Antarctica particularly with regard to Oamaru's connections with Antarctica and conservation of the huts.

Event K220

9-Jan-04 to 16-Jan-04

SB Local/Huts

Education Familiarisation Visit

Antarctica New Zealand, Christchurch. Natalie Cadenhead, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: n.cadenhead@antarcticanz.govt.nz

Familiarisation visits for educators representing: - Organisations which provide Antarctic information on a day to day basis to a wide audience. Visit to provide credibility to educators.

Event K230

3-Dec-03 to 9-Dec-03

SB local

Education Initiatives in Antarctica Programme

Antarctica New Zealand, Christchurch. Natalie Cadenhead, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: n.cadenhead@antarcticanz.govt.nz

Familiarisation visits for photographer representing the Wigram Air Force Museum. Visit to provide material for future educational initiatives and exhibitions at the Museum.

Material collected will be shared with NZDF Joint Forces Command for PR purposes and Waiouru Army Museum for development of exhibitions relating to Antarctica.

Event K231**9-Jan-04 to 23-Jan-04****SB local****Education Initiatives in Antarctica Programme**

Christ's College, Christchurch. Paul Rodley.

To create a virtual tour of Scott Base on CD & Website including text based worksheets for teaching. To provide insight into life at Scott Base and into the physical environment and how this impacts on the working lives of researchers and support staff. To create other virtual tours as requested by Antarctica New Zealand.

Event K232**9-Jan-04 to 20-Jan-04****With K320 & K321****Education Initiatives in Antarctica Programme**

Christchurch College of Education. Patrick Shepherd.

Creation of compositions and education resources relating to the music curriculum at a variety of levels including pre-service and in service training and level 1-4 of the school curriculum.

Event K233**8-Dec-03 to 18-Dec-03****SB local****Assessment of Non-fossil Fuel Energy and Field Waste Minimisation Research Opportunities**

University of Canterbury, Private Bag 4800, Christchurch. Dr Pat Bodger.

Antarctica New Zealand has identified a need for energy systems which are not reliant on fossil fuels and field waste minimisation solutions. In K233 Pat Bodger, Professor of Electric Power Engineering and Director of the Electric Power Engineering Centre, will visit Scott Base and relevant field sites to better understand the issues and identify areas in which the Canterbury University School of Engineering could provide solutions through post graduate research projects.

Event: K301**1-Dec-03****to 6-Dec-03****Marine Strategy Group Familiarisation Visit**

Antarctica New Zealand, Christchurch. Rebecca Roper-Gee, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: r.ropergee@antarcticanz.govt.nz

The 2002 Government Strategic Interests for Antarctica and the Southern Ocean place a stronger than ever emphasis on the marine environment, including understanding and protecting its biodiversity. A Marine Strategy Group is to be convened from relevant OAC agency representatives, to identify appropriate initiatives for New Zealand over the next 5-10 years, to implement the Government's objectives. The purpose of this event is to provide first hand knowledge and experience of Antarctica and in particular marine science and protection issues. The group will visit sites, facilities and science events around Ross Island.

Event: K302

24-Nov-03 to 28-Nov-03

Familiarisation visit for key stakeholders from the Government sector

Antarctica New Zealand, Christchurch. Lou Sanson, Phone: (03) 358 0200, Fax: (03) 358 0211.

Familiarisation visit for key stakeholders from the Government sector.

Event K303

16-Jan-04 to 20-Jan-04

Antarctic Heritage Trust Distinguished Visitor Programme

International Antarctic Centre, Christchurch. Nigel Watson, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: n.watson.aht@antarcticanz.govt.nz

Representatives of the Trust and various individuals/organisation representatives will visit the huts to profile the conservation work of the Trust as part of a distinguished visitor programme.

Event K310

14-Nov-03 to 25-Nov-03

Report on Developments and Research being done in Antarctica

NZ Herald. Simon Collins & Mark Mitchell

To circulate in all newspapers in the Wilson and Horton Group within New Zealand and within the Independent News & Media group internationally. To report on developments in the understanding of the natural world through research being done in Antarctica and the pressures on the Antarctic and Southern Ocean environment from commercial activities. To document efforts being made to protect the environment.

Event K311

9-Jan-04 to 16-Jan-04

Media Programme

Vaughan Yarwood

To promote and present NZ's role in the leading edge science and artistic endeavour on the ice and the history of Antarctic exploration to a wide cross section of the New Zealand public. To research and write a comprehensive account of Antarctic exploration and discovery.

Event K312

17-Dec-03 to 9-Jan-04

Media Programme

The Press, Christchurch. John Henzell.

To write more effectively on Antarctica topics in the future. For distribution to newspapers around New Zealand. To write about the Graduate Certificate in Antarctic Studies students' field trip and their impressions and research stories in Antarctica at the time.

Event K313

17-Nov-03 to 25-Nov-03

Media Programme

National Radio. Kim Hill.

Broadcasting National Radio's Saturday Morning programme from Scott Base on the 22nd of November. To re-create the usual weekly programme on the ice, and celebrate a unique isolated community with strong links to the New Zealanders listening back home. Programme to include several long interviews. Max Cryer may link to the programme from New Zealand, concentrating on "Curious Questions" about Antarctica.

Event K314

24-Nov-03 to 2-Dec-03

Media Programme

20/20 Programme for TV3 . Stephen Davis.

To film features on Grahame Sydney and life in Antarctica. Focus on science events in local Scott Base environs.

Event K320

9-Jan-04 to 20-Jan-04

Artists to Antarctica Programme

David Trubridge.

To use the experience to develop a design ethic and vocabulary related to the environment of Antarctica. To visit the historic huts and ice structures. To develop a series of works on these structures for survival to exhibit in NZ and internationally.

Event K321

9-Jan-04 to 20-Jan-04

Artists to Antarctica Programme

Laurence Fearnley.

To use the experience to gather materials in order to write a fiction novel based in the Antarctic environment.

Event K323

20-Oct-03 to 3-Nov-03

Artists to Antarctica Invitational Programme

Grahame Sydney

To gather materials for a range of paintings reflecting his experience of Antarctica.

Event K400

various

Antarctica New Zealand Staff Visits

Antarctica New Zealand, Christchurch. Lou Sanson, Phone: (03) 358 0200, Fax: (03) 358 0211.

The purpose of this event is to provide experience and familiarity with Scott Base and Antarctic field operations for Antarctica New Zealand staff, provide for hand-over and liaison with relevant Scott Base staff, and allow necessary on-site management, audit and inspection.

Event K401

20-Aug-03 to 20-Feb-04

Scott Base Summer Support Staff

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Event K402

30-Sep-03 to 15-Oct-04

Scott Base Winter Support Staff

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Event K403

27-Nov-03 to 2-Dec-03

Antarctica New Zealand Board of Directors Visit

Antarctica New Zealand, Christchurch. Lou Sanson, Phone: (03) 358 0200, Fax: (03) 358 0211.

Visit to Scott Base by the Antarctica New Zealand Board of Directors.

Event K411

5-Nov-03 to 27-Jan-04

Helicopter support

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Helicopter support for Antarctica New Zealand sponsored operations provided by Helicopters (NZ) Ltd.

Event K412

13-Oct-03 to 3-Jan-04

RNZAF Antarctic Field Training

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Antarctic field training for RNZAF 40 Squadron aircrew.

Event K413

14-Dec-03 to 2-Jan-04

RNZN (USCG Attachment)

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
Providing RNZN personnel with experience of US Coastguard icebreaker operations in the Antarctic.

Event K414

Various to various

Worker Visitors - non-engineering

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
Short term visits by Dr Jonathan Pascoe (Medical Advisor), I.T. Support (TBC) and Andris Apse (Photographer).

Event K420

10-Dec-03 to 20-Feb-04

Army Engineers

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
Various maintenance, minor alterations and construction tasks.

Event K421

WS1: 16-Dec-03 to 13-Jan-04

WS2: 27-Jan-04 to 13-Feb-04

Operation White Safari

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
New Zealand Defence Force assistance in maintenance and environmental tasks.

Event K423

17-Oct-03 to 3-Nov-03

Communications Inspections & maintenance

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
Annual inspection, maintenance and installation of communications equipment at Scott Base and field repeaters.

Event K424

various to various

Worker Visitors – Engineering

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz
Short term visits for maintenance, construction or consultancy projects.

Event K425**20-Oct-03 to 2-Feb-04****Construction of Warm Store/ Field Store Facility**

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Commencing in December 2003, a 1400m² combined warm store/field store facility will be constructed on a site immediately north of the Scott Base garage. When commissioned in September 2005, this facility will provide centralised, heated storage and controlled cold storage for foodstuffs, and heated storage for engineering, housekeeping supplies, and field equipment. The facility will include a dedicated area for preparation of science events for the field, a dedicated freezer for storage of science samples, cargo receipt and dispatch facilities, field equipment maintenance areas, field training briefing room and office space for Scott Base stores and field staff. In addition, there will be a drying room suitable for washing and drying field gear, a fitness centre and a field waste handling facility. During the 2003/2004 summer season, an earthen building platform will be constructed and all construction materials will be delivered in February 2004.

Event K430**2-Oct-03 to 7-Oct-03****Scott Base****Armed Forces Canteen Council**

Antarctica New Zealand, Christchurch. Julian Tangaere, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: j.tangaere@antarcticanz.govt.nz

Staff visit to oversee shop and bar operations.

Event K440**6-Jan-04 to 6-Feb-04****Antarctic Heritage Trust Historic Sites Management**

International Antarctic Centre, Christchurch. Nigel Watson, Phone: (03) 358 0200, Fax: (03) 358 0211, E-mail: n.watson.aht@antarcticanz.govt.nz

Employees and contractors will undertake the annual conservation programme at the historic sites on Ross Island and undertake planning work for the Trust's restoration project. This includes maintenance of the hut structures, completion of site surveys, documentation and assessment of artefacts, conservation treatment and environmental monitoring. Activities are scheduled for Hut Point, Cape Evans and Cape Royds.

Event K450**27-Nov-03 to 5-Dec-03****TAMDEF****LINZ Projects**

Office of the Surveyor-General, Wellington. Graeme Blick.

Land Information New Zealand (LINZ) and its predecessor agencies (the Department of Lands & Survey until 1987 and the Department of Survey and Land Information until 1996) have operated surveying, charting and mapping programmes in the Ross Sea Region, as well as place naming administration, for some 30 years. The department has an agreement with the United States Geological Survey, which provided for co-operation

in these activities and in particular joint topographic mapping, geodetic surveying, and place naming programmes. In more recent years the survey programme has moved away from the support of individual science programmes to the provision of a multi-purpose geodetic referencing system. The logistics for these activities have been provided mainly through the US programme in recent years, and there is a need to move to a more balanced situation. The objectives for this season are to: - Service the tide gauge at Cape Roberts; - Remove the old, unused drum beacons ; - Support the TAMDEF I and TAMDEF II (Trans-Antarctic Mountains Deformation) programme with the US; and - Provide familiarisation for the Secretary of the Geographic Board, who is responsible for place naming in the Ross Dependency.

Event K451

14-Nov-03 to 25-Nov-03

Australian Antarctic Division Familiarisation Visit

Don Hudspeth, Phone: 00 61 3 62 323 280, E-mail: don.hudspeth@aad.govt.au

Visit of Australian Antarctic Division Field Support Co-ordinator. Specifically looking at air transport, field training, logistics and Search & Rescue.

Event K452

Italian Programme

Contribution to ENEA transport pool.

Event K500

Environmental Management and Monitoring Projects

Antarctica New Zealand, Christchurch. Rebecca Roper-Gee, Phone: (03) 358 0200, Fax:

(03) 358 0211, E-mail: r.ropergee@antarcticanz.govt.nz

Environmental review of Antarctica New Zealand operations and supported activities including monitoring for compliance with the Antarctica (Environmental Protection) Act 1994, Initial clean up efforts at the former site of joint NZ-US Cape Hallett Station are also planned.