

# Scientific Information

2002/2003 Annual

New Zealand

## Forward Plans

### LGP

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.

LGP has been formally incorporated into the SCAR programme RiSCC (Regional Sensitivity to Climate Change). Certain data collected within the LGP will be housed and made available within the RiSCC database framework. Details on how the data will be shared and the timing of when the data will be made available have yet to be decided. It is intended that publications arising from the LGP will be published in a special issue of a refereed journal.

Research under the LGP will be both ship-based and land-based. At present, ship-based research, funded under the Ministry of Fisheries' BioRoss programme and the Italian Antarctic Programme, has been scheduled for January to March 2004 with a research voyage planned using two vessels aimed at supporting near-shore and deep-water marine research. The vessels dedicated to this research are NIWA's *RV Tangaroa*, and the Italian Antarctic Programme's *RV Italica*. Further information about the ship-based research can be found in the BioRoss research plan and in the BioRoss call for statements of interest. (Contact Dr Dean Peterson, Science Strategy Manager, Antarctica New Zealand).

Five land-based sites have been proposed to be studied for two years each starting in the 2003/04 season. The proposed sites are Cape Hallett (first site in 03/04 and 04/05), Darwin Glacier, Terra Nova Bay area, Granite Harbour and Beardmore Glacier. A year out between each site will allow for reconnaissance of the next site and facilitate re-location of camp resources, as well as providing time for data analysis and write-up.

### ANDRILL

**ANDRILL is a multinational scientific initiative to investigate Antarctica's role in Cenozoic to recent (65 million years ago to the present) global environmental change, and hence its potential future role, through stratigraphic drilling of Antarctica's ice marginal sedimentary basins. An ANDRILL consortium has been established, comprising four countries – Germany, Italy, New Zealand and the United States of America.**

A key aim of ANDRILL is to understand the role of Antarctic drivers on global climate variability, which requires a fundamental knowledge of cryospheric evolution not only in recent times, but also for times as long ago as 40 million years into the past. This was a time when global temperature and atmospheric carbon dioxide (CO<sub>2</sub>) were last similar to that which might well be reached by the end of this century. Through better understanding the interaction between the Antarctic

cryosphere (ice sheets, ice shelves, and sea ice) and global systems during previous warmer periods, there will be a more comprehensive understanding of the impacts of predicted future climate warming – both in Antarctica and globally.

The goals of ANDRILL are to:

- **Determine the fundamental behaviour of the Antarctic cryosphere, including the magnitude and frequency of its changes on centennial to million year time-scales.**
- **To obtain geological records from critical intervals in the development of the Antarctic cryosphere to guide and constrain glaciological and climatic models.**
- **To document the evolution and timing of major Antarctic rift and tectonic systems, and the stratigraphic development of associated sedimentary basins.**
- **To determine, by correlating near-ice margin and Southern Ocean stratigraphic records, the role of the Antarctic.**

## **BIOROSS**

The Marine Biodiversity Research: Biodiversity of the Ross Sea Programme has been developed collaboratively by the Ministry of Fisheries, Antarctica New Zealand and the Ministry of Foreign Affairs and Trade. The programme is a critical initiative for achieving the goals of *The New Zealand Biodiversity Strategy – Our Chance to Turn the Tide* ([www.doc.govt.nz/cons/biodiversity/biodiversity\\_template.html](http://www.doc.govt.nz/cons/biodiversity/biodiversity_template.html)) and for improving understanding of biodiversity and providing information to enable action to be taken to protect and enhance the environment. The overarching objectives of the programme are to develop an inventory of the biodiversity present in selected marine communities in the Ross Sea region and to facilitate better state of the environment reporting.

The Ministry of Fisheries is funding a marine biodiversity research voyage to the Ross Sea in early 2004. The survey will be carried out in collaboration with the Italian Antarctic Programme and Land Information New Zealand. The overall objective of the survey is to carry out a quantitative survey of the biodiversity of selected marine communities in the Ross Sea region, including the Balleny Islands.

## Science Activities in Previous Year

<b>Subject</b>	<b>Investigation</b>	<b>Locality</b>	<b>Principal Investigator</b>
Marine	Molecular Identification of Planktonic Organisms from the Ross Sea	Coastal areas between Scott Base and Cape Armitage	Dr Mary A. Sewell
Marine Biology	Mate Selection in the Adelie Penguin ( <i>Pygoscelis adeliae</i> ): male quality and female choice	Cape Bird, Cape Royds, Cape Crozier	Ms Emma Marks (PhD student)
Terrestrial	Evaluation of Deterioration Historic Huts and Terrestrial Biodiversity	Cape Evans, Cape Royds, Granite Harbour	Professor Roberta L. Farrell
Freshwater	Millennial-Scale Fluctuations of Dry Valleys Lakes: Implications for Regional Climate Variability and the Interhemispheric (A)synchrony of Climate Change	Dry Valleys Lakes: Lake Fryxell, Lake Bonney, Lake Joyce	Dr Chris Hendy
Terrestrial Biology	Biodiversity and Performance of Lichens and Mosses	Dry Valleys:	Prof T G Allan Green
Molecular Biology	Molecular Ecology of Antarctic Fauna	Cape Bird, Cape Adare	Professor David Lambert
Marine Biology/Human impacts	Hormonal and Behavioural Responses of Adelie Penguins to People and to Predators	Cape Bird, Cape Crozier, Cape Royds	Dr John F. Cockrem
Oceanography	Oceanography and Sedimentation Beneath the McMurdo/Ross Ice Shelf in Windless Bight.	Ross Ice-shelf, Windless Bight	Prof Peter Barrett
Oceanography	Cape Roberts Tide Gauge	Cape Roberts	Mr. A.R. Pyne
Glaciology / Climatology	Origin of Antarctic Permafrost: When were the Dry Valleys Last Wet?	Dry Valleys, Victoria and Pearse Valleys	Dr Warren Dickinson
Geology	Paleozoic Terrane Correlation: New Zealand and Antarctica (continued)	Bowes mountains and Molar	Prof John D. Bradshaw
Terrestrial	Natural Spatial Subsidies in Continental Antarctic Soil	Garwood Valley	Dr L.G. Greenfield
Atmospheric	Dynamics and Ionisation in the Antarctic Middle Atmosphere	Arrival Heights Ross Island	Dr Grahame Fraser
Marine Biology	Responses of Marine Organisms to Changing Environmental Conditions	Marble Point, Victoria Valley	Assoc Prof. Bill Davison
Marine Biology	Human Impacts and Microbial-Chemical ecology of Antarctic sponges.	Scott Base, Cape Armitage, Dellbridge	Dr. N.S. Webster

		Islands	
Geology	Processes of Volcanic Vent Evolution: Coombs Hills	Coomber Hills	Dr. James D.L. White
	The Effect of Spatial and Temporal Variation in Marine Productivity on Energy Acquisition in Female Waddell Seals	Hutton Cliffs	Dr Lloyd Davies
Glaciology	Basal Ice and Substrate Deformation at Subfreezing Temperatures	Victoria Glacier Coright Glacier	Dr Sean Fitzsimons
Marine Biology	Metabolic Consequences of Diving in the Weddell Seal	Scott Base, Dellbridge Islands	Dr Sheila J. Thornton
Marine Biology	Evolution and Adaptation in Notothenioid Fish	Cape Roberts, Cape Armitage	Dr Craig Marshall
Glaciology / Marine Biology	Optical Properties of the Annual Sea Ice at McMurdo Sound: A test of the effects of Ultraviolet – B radiation on embryos and larvae of the sea urchin <i>Sterechinus neumayeri</i>	Cape Evans, Scott Base	Dr. Miles Lamare
Atmospheric	Monitoring Magnetosphere-Ionosphere Coupling and Space Weather at High Latitudes	Arrival Heights	Professor Brian J. Fraser
Freshwater and Marine Ecology	Antarctic Aquatic Ecosystems	Granite Harbour, Marble Point, New Harbour, Terra Nova Bay	Dr. Ian Hawes
Atmospheric	Processes and Interactions in the Antarctic Atmosphere	Scott Base, Arrival Heights	Dr Stephen Wood
Climatology	Climate Data Acquisition – Scott Base and Arrival Heights, Antarctica	Scott Base, Arrival Heights	Andrew Harper
Marine Biology	The Evolution of the TransAntarctic Mountains and its Associated Rift System.	Granite Harbour Lower Ferrar Glacier	Dr Stephen Bannister
Human Impacts	Geophysical Site Surveys for the Proposed ANDRILL Drill site on Ross Ice Shelf, Black Island-Brown Peninsula Region.	Ross ice Shelf: Windless Bight And Black Island. Brown Peninsula	Dr Tim Naish
Glaciology	Adelie Penguin Population Dynamics	Cape Bird, Cape Crozier, Cape Royds, Beaufort Island	Dr Peter Wilson
Terrestrial / human impacts	Impacts of Human Activities on Antarctic Soils	Dry Valleys: Beacon Valley, Victorian Valley, Granite Harbour	Dr Jackie Aislabie

Glaciology	Sea Ice and Southern Ocean Processes	Southern McMurdo Sound, Cape Evans and Cape Royds	Dr T G Haskell
Glaciology	The Freezing of Land-Fast Sea ice During the Antarctic Winter	Southern McMurdo Sound, Cape Evans and Cape Royds	Dr Pat Langhorne
Terrestrial biology	Biology of Antarctic Springtails	Cape Hallett	Dr Brent J Sinclair

# Operational Information

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## NATIONAL EXPEDITIONS

### Year Round Facility

#### Scott Base (year round facility)

- **Region:** Ross Island, McMurdo Sound
- **Latitude:** 77°51'00"S
- **Longitude:** 166°45'46"E
- **Date opened:** 25 January 1957.
- **Maximum population:** 85 person (summer), average 10 person (winter)
- **Medical support:** Scott Base has a first aid facility. Advanced medical care is available at McMurdo Station (United States Antarctic Program).

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### Summer Field Camp

- Not applicable.

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## Refuge Huts

### CAPE ROYDS HUT

- **Region:** Cape Royds, Ross Island
- **Latitude:** 77°33'S
- **Longitude:** 166°10'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 2 person

### CAPE EVANS HUT

- **Region:** Cape Evans on the west coast of Ross Island at northern entrance to Erebus Bay
- **Latitude:** 77°38'S
- **Longitude:** 166°24'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 4 person

### LOWER WRIGHT HUT

- **Region:** South side of Wright Valley (approximately 1 mile west of Wright Lower Glacier)
- **Latitude:** 77°26'S

- **Longitude:** 162°37'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 2 person

#### **BRATINA ISLAND HUT**

- **Region:** Near northern tip of Brown Peninsula
- **Latitude:** 78°01'S
- **Longitude:** 165°32'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 12 person

#### **CAPE BIRD HUT**

- **Region:** Adjacent to Adelie penguin rookeries at northern tip of MacDonald's Beach
- **Latitude:** 77°14'S
- **Longitude:** 166°28'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 8 person

#### **LAKE VANDA**

- **Region:** Three relocatable huts opposite former site of Vanda Station, near the mouth of the Onyx River
- **Latitude:** 77°31'S
- **Longitude:** 161°40'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 8 person

#### **CAPE ROBERTS**

- **Region:** Situated on promontory on south east edge of Granite Harbour
- **Latitude:** 77°02'S
- **Longitude:** 163°12'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 4 person

#### **CAPE HALLETT**

- **Region:** Adelie penguin rookery on Seabee Hook
- **Latitude:** 72°19'S
- **Longitude:** 170°16'E
- **Medical facilities:** Survival box
- **Accommodation capacity:** 6 persons

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## Major Field Activities

### **NEW ZEALAND EVENT NUMBER K042 – OCEANOGRAPHY AND SEDIMENTATION BENEATH THE MCMURDO/ROSS ICE SHELF**

- **Region:** Ross Ice Shelf / Windless Bight
- **Latitude:** 77°42'S
- **Longitude:** 167°40'E

### **NEW ZEALAND EVENT NUMBER K114 – GEOPHYSICAL SITE SURVEYS FOR THE PROPOSED ANDRILL DRILL SITE**

- **Region:** Ross Ice Shelf / Windless Bight and Black Island / Brown Peninsular
- **Latitude:** 78°20'S
- **Longitude:** 166°20'E

### **NEW ZEALAND EVENT NUMBER K131 – SEA ICE AND SOUTHERN OCEAN PROCESSES**

- **Region:** Southern McMurdo Sound / Cape Evans / Cape Royds
- **Latitude:** 77°38'S
- **Longitude:** 166°24'E

### **NEW ZEALAND EVENT NUMBER K081 – ANTARCTIC AQUATIC ECOSYSTEMS**

- **Region:** Granite Harbour / Marble Point / New Harbour / Cape Evans
- **Latitude:** 76°53'S (Granite Harbour), 77°26'S (Marble Point), 77°36'S (New Harbour), 77°38'S (Cape Evans)
- **Longitude:** 162°44'E (Granite Harbour), 163°50'E (Marble Point), 163°51'E (New Harbour), 166°24'E (Cape Evans)

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## Vessels

- Nil.

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## Aircraft

### **C130H HERCULES**

- **Number and type of aircraft:** 2 x C130H Hercules
- **Number of flights:** 15
- **Period of flights:** 18 November – 20 December 2002
- **Routes:** Christchurch/McMurdo and McMurdo/Christchurch
- **Purpose:** Delivery of personnel and essential supplies from New Zealand to Ross Island.

## BELL 212

- **Number and type of aircraft:** 1 x Bell 212
- **Number of flights:** Various
- **Period of flights:** 7 November 2002 – 25 January 2003
- **Routes:** Operations within 100 n.m. of Scott Base
- **Purpose:** Delivery of personnel and supplies from Scott Base to field campsites.

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## Research Rockets

- Not applicable.

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## Military

<b>Number</b>	<b>Rank</b>
1	Major General
1	Wing Commander
1	Lieutenant Commander
3	Squadron Leader
9	Flying Officer
10	Flight Lieutenant
1	Lieutenant
1	Warrant Officer
5	Sergeant Engineer
2	Flight Sergeant Engineer
5	Sergeant Air Load Master
1	Flight Sergeant Air Load Master
3	Corporal Air Load Master
4	Sergeant
3	Corporal
1	Mechanical Engineer
1	Lance Corporal
2	Able Communications Operator
4	Sapper
2	Leading Aircraft Person
2	Leading Signaller
1	Leading Marine Technician
1	Private
1	Able Marine Technician
1	Able Hydrographic Assistant

- **Number and type of personal armaments carried:** Nil
  - **Number and type of armaments on ships and aircraft:** Nil
  - **List of armaments on stations/bases:** Nil
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## NON-GOVERMENTAL EXPEDITIONS

### Ship-Based Operations

#### AKADEMIK SHOKALSKIY

- **Operator:** Heritage Expeditions Ltd
- **Flag state:** Russia
- **Number of voyages:** 2
- **Departure dates:** 3 January, 1 February 2003
- **Antarctic ports of departure/arrival:** Hobart, Bluff
- **Areas of operation:** Voyage 1
  - 3 Jan Depart Hobart
  - 4 Jan At sea
  - 5 Jan At sea
  - 6 Jan At sea
  - 7 Jan Macquarie Island
  - 8 Jan Macquarie Island
  - 9 Jan At sea
  - 10 Jan At sea
  - 11 Jan At sea
  - 12 Jan At sea
  - 13 Jan Cape Adare
  - 14 Jan At sea
  - 15 Jan At sea
  - 16 Jan At sea, cruising off C19 ice berg
  - 17 Jan At sea
  - 18 Jan Possession Island
  - 19 Jan At sea
  - 20 Jan At sea
  - 21 Jan At sea
  - 22 Jan At sea
  - 23 Jan Campbell Island
  - 24 Jan Campbell Island
  - 25 Jan Auckland Island
  - 26 Jan Enderby Island
  - 27 Jan Auckland Island
  - 28 Jan Auckland Island
  - 29 Jan Snares Island
  - 30 Jan Stewart Island
  - 31 Jan Bluff
- **Areas of operation:** Voyage 2
  - 1 Feb Depart Bluff
  - 2 Feb At sea
  - 3 Feb Campbell Island
  - 4 Feb At sea
  - 5 Feb At sea

6 Feb	At sea
7 Feb	At sea
8 Feb	At sea, Cape Adare area
9 Feb	At sea
10 Feb	At sea
11 Feb	Cape Evans and Cape Royds
12 Feb	Cape Bird
13 Feb	Franklin Island
14 Feb	At sea
15 Feb	At sea, Balleny Islands area
16 Feb	At sea, Balleny Islands area
17 Feb	At sea
18 Feb	At sea
19 Feb	At sea
20 Feb	At sea
21 Feb	Auckland Island
22 Feb	Enderby Island
23 Feb	At sea
24 Feb	Bluff

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### Land-Based Operations

- Nil

# Permit Information

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## Visits to Protected Areas

### ASPA 105 BEAUFORT ISLAND

Event No.	No. entered	Dates	Purpose
K122	6	26/12/02	Adélie penguin research

### ASPA 106 CAPE HALLETT

Event No.	No. entered	Dates	Purpose
K140	4	9/11/02-26/1/03	Research on terrestrial ecosystem

### CAPE ROYDS ASPA 121

Event No.	No. entered	Dates	Purpose
K019	2	19/11/02	Adélie penguin research
K034	4	05 and 06/12/02	Adélie penguin research
K440	2	19/01/03	Inspection of historic artefacts

### ASPA 122 ARRIVAL HEIGHTS

Event No.	No. entered	Dates	Purpose
K294	2	21/08/02 and 6/10/02	Filming
K231	3	31/10/02	Education
K320	1	12/11/02	Arts
K221, 222, 223	8	23/11/02	Education
K210	6	6/12/02	Education
K055	4	11/01/03-23/01/03	Operation and maintenance of radar
K089	7	15/01/03-16/01/03	Calibration of meteorological equipment
K069	2	22/01/02	Maintenance of scientific equipment
K087	3	27/01/03-30/01/03	Air sampling
K230	3	02/02/02	Education
K085	4	Throughout year	Atmospheric measurements

### ASPAS 124 CAPE CROZIER

Event No.	No. entered	Dates	Purpose
K034	4	07-09/12/02	Adélie penguin research
K019	3	28/12/02-30/12/02	Adélie penguin research
K440	3	10/01/03	Historic site survey

### ASPAS 131 CANADA GLACIER

Event No.	No. entered	Dates	Purpose
K024	6	10/01/03-3/2/03	Lichen & moss research programme
K230, K231	3	23/01/03-25/01/03	Education and arts

### ASPAS 154 BOTANY BAY

Event No.	No. entered	Dates	Purpose
K123	3	13/01/03	Soil research
K440	4	15/01/03	Heritage conservation

### ASPAS 155 CAPE EVANS

Event No.	No. entered	Dates	Purpose
K068	2	unknown	Recreation
K401, 402	5	10/10/02	Recreation
K401, 056, 068, 085, 412, 424	13	21/10/02	Recreation
K059, 401	4	27/10/02	Recreation
K059, 068, 085, 401	9	27/10/02	Recreation
K313, 231, 401, 400	6	1/11/02	Education, media and recreation
K059	6	3/11/02	Recreation
K065, 068, 131, 320, 401	17	10/11/02	Recreation and arts
K401	3	13/11/02	Recreation
K081, 114, 401	10	13/11/02	Recreation
K300, 400	8	19/11/03	Distinguished visitors
K063, 224, 401, 500	9	20/11/02	Recreation, education, GPS survey
K057, 068, 220, 221, 223, 401, 440	12	24/11/02	Recreation
Fam trip	12	01/12/02	Recreation
Fam trip	12	01/12/02	Recreation
K210, 400, 401	8	03 and 04/12/02	Education
K210, 311,	10	04/12/02	Education, media and recreation

400, 401			
Fam trip	28	08/12/02	Recreation
K440	5	11-16/12/02	Heritage conservation
K232	1	11-16/12/02	Education
Fam trip	16	15/12/02	Recreation
K200	29	22/12/02	Observation
K021	4	12/01/02-15/01/02	Research on deterioration of historic huts
K400	3	07/02/03	Staff familiarisation

### BACKDOOR BAY ASPA 157

Event No.	No. entered	Dates	Purpose
K401, 056, 068, 085, 412, 424	13	21/10/02	Recreation
K059, 401	4	27/10/02	Recreation
K059, 068, 085, 401	9	27/10/02	Recreation
K065, 068, 131, 320, 401	17	10/11/02	Recreation and arts
K320, K081	unknown	16/11/02	Arts, recreation
K300, 400	8	19/11/03	Distinguished visitors
	2	19/11/02	Penguin recording. Hut visit
K063, 224, 401, 500	9	20/11/02	Recreation, education, GPS survey
K057, 068, 220, 221, 223, 401, 440	12	24/11/02	Recreation, education
K310	2	24/11/02	Recreation, media
Fam trip	12	01/12/02	Recreation
Fam trip	12	01/12/02	Recreation
K034, 210, 400, 401	12	5/12/02	Education, recreation
Fam trip	28	8/12/02	Recreation
Fam trip	16	15/12/02	Recreation
K232	1	15/12/02	Education
K200	29	22/12/02	Observation
K021	4	9/01/01-12/01/01	Research on deterioration of historic huts
K400	3	07/02/03	Staff familiarisation
K440	5	16-22/02/03	Heritage conservation

## ASPA 158 HUT POINT

Event No.	No. entered	Dates	Purpose
K401, 414, 081	8	14/10/02	Recreation
K401, 424	5	17/10/02	Recreation
K402, 424	3	18/10/02	Recreation
K056	2	20/10/02	Recreation
RNZAF	4	24/10/02	Recreation
K063	3	25/10/02	Recreation
K085	1	29/10/02	Recreation
K231, 313, 400	4	31/10/02	Education and media
K140	4	05/11/02	Recreation
K300	7	13/11/02	Distinguished visitors
K063	2	14/11/02	Recreation
K114	1	17/11/02	Recreation
K051, 200, 224, 312	4	17/11/2	Education and media
K220, 221, 222, 223	7	22/11/02	Education & familiarisation
		25/11/02	Recreation
K401, 402	2	26/11/02	Recreation
K301	9	28/11/02	Distinguished visitors
K440	5 (max)	Various between 29/11/02-30/12/02	Heritage conservation
K210	6	01 and 02/12/02	Education
K057	4	04/12/02	Recreation
K411	1	05/12/02	Recreation
RNZAF	2	06/12/02	Recreation
K101	3	07/12/02	Recreation
K232	1	9 and 10/12/02	Education
K402	1	16/12/02	Recreation
K411, USAF	2	18/12/02	Recreation
K200	8	30/12/02	Education
K200	14	31/12/02	Observation
K021	5	08, 09 and 16/01/03	Research on deterioration of historic huts
K230	1	18/01/03	Recreation
K024	6	04/02/03	Recreation
K440	2	14/02/03	Heritage conservation
K440, 401	2	27/02/02	Heritage conservation
K400	3	unknown	Recreation

## ASPA 159 CAPE ADARE

Event No.	No. entered	Dates	Purpose
K440	5	27/01/03-08/02/03	Heritage conservation

## Taking and Harmful Interference with Flora and Fauna

<b>Event No.</b>	<b>Species</b>	<b>Location</b>	<b>Type or Amount</b>	<b>Purpose</b>
K018	Marine invertebrate larvae	McMurdo Sound (site near road to Sea Ice Runway)	486 taken	Taxonomic research
K063	<i>Leptonychotes weddellii</i>	Hutton Cliffs	30 adult females, 30 pups - catching, weighing, measuring, attaching instruments, blood and blubber samples.	Weddell seal energy acquisition research
K081	<i>Mixed microbial mats</i>	Bratina Island	30 cores 5cm diameter	Aquatic ecosystems research
	<i>Mixed microbial mats</i>	Lake Hoare	30 cores 2cm diameter 7 cores 5cm diameter	
	<i>Seafloor sediments, epifaunal animals</i>	Dunlop Island	15 cores 5cm diameter 30 cores 2.6cm diameter 90 epifaunal animals taken	
	<i>Seafloor sediments, epifaunal animals</i>	Spike Cape	15 cores 5cm diameter 30 cores 2.6cm diameter 90 epifaunal animals taken	
	<i>Seafloor sediments, epifaunal animals</i>	New Harbor	15 cores 5cm diameter 30 cores 2.6cm diameter 90 epifaunal animals taken	
	<i>Seafloor sediments, epifaunal animals</i>	Cape Evans	20 cores 5cm diameter 20 cores 2.6cm diameter 50 epifaunal animals taken	
	<i>Seafloor sediments, epifaunal animals</i>	Terra Nova Bay	15 cores 5cm diameter 3 cores 2.6cm diameter 50 epifaunal animals taken	
K059	<i>Homaxinella balfourensis</i>	Winter Quarters Bay, Cape Armitage, Pram Pt., Scott Base, Turtle Rock, Cape Evans	Small sections of 4 individuals of each species taken at each site	Human impacts on sponges research
	<i>kirkpatrickia variolosa</i>			
	<i>Latrunculia apicalis</i>			
	<i>Mycale ascerata</i>			
	<i>Sphaerotylus antarcticus</i>			
	<i>Laternula sp.</i>			
	<i>soft corals</i>			

K068	<i>Sterechinus neumayeri</i>	Cape Armitage	150 taken	Effects of UVB on sea urchin research
	<i>Odondaster validus</i>	Cape Armitage	20 taken	
	<i>Sterechinus neumayeri</i>	Pram Point	50 taken	
K019	<i>Pygoscelis adeliae</i>	Cape Bird	51 adults and 32 chicks observed, weighed, tagged, wings measured, flippers tagged, nests marked	Adélie penguin mate selection research
	<i>Pygoscelis adeliae</i>	Cape Royds and Cape Crozier	Minimal disturbance by moving through colony to record vocalisations	
K024A	<i>Henediella heimii</i> <i>Bryum argenteum</i> <i>Nostoc sp</i>	Canada Glacier, Lake Fryxell, Taylor Valley	16 samples 6cm <sup>2</sup> 30 samples of 1cm <sup>2</sup>	Research - gas exchange and nitrogen analysis
	<i>Endolithic organisms, mainly algae and lichens</i>	Lower Taylor Valley	200 small lichen samples	Research - for identification
	<i>Insects</i>	Lower Taylor Valley	Around 20 per site, total 800	Research
	<i>Endolithic organisms, mainly algae and lichens</i>	Mt Falconer	40 rock chips 5cm <sup>2</sup> 20 lichen samples 5cm <sup>2</sup> taken	Research
K024B	Mites	Mt Kyffin	22	Research - biodiversity survey
	Springtails	Mt Kyffin	75	

	<i>Acarospra gwynii</i> <i>Buellia</i> aff. <i>grisea</i> <i>Buellia frigida</i> <i>Carbonea</i> sp. <i>Lecida</i> sp. <i>Lecida</i> aff. <i>Cancriformis</i> <i>Lecidella</i> sp. <i>Lepraria</i> sp. <i>Mycarea</i> aff. <i>turfacea</i> sp. <i>Pseudephebe</i> <i>pubescens</i> <i>Pseudephebe</i> <i>minuscule</i> <i>Rhizocarpon</i> gr. <i>Geographicum</i> <i>Taeniolella</i> sp. <i>Usnea sphacelata</i> <i>Umbilicaria</i> <i>decussata</i> Aff. <i>Grimmia</i>	Mt Kyffin	200 specimens taken, many identifications still tentative	
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K030	<i>Pygoscelis adeliae</i>	Cape Bird	1000 blood samples	Molecular DNA research
	<i>Pygoscelis adeliae</i>	Coulman Is.	38 blood samples	
	<i>Pygoscelis adeliae</i>	Inexpressible Is.	30 blood samples	
K034	<i>Pygoscelis adeliae</i>	Cape Bird	110 blood samples 106 behavioural observations	Penguin response research
	<i>Pygoscelis adeliae</i>	Cape Royds	20 blood samples	
	<i>Pygoscelis adeliae</i>	Cape Crozier	20 blood samples	
K057	<i>Pagothenia borchgrevinki</i>	McMurdo Sound	100 taken	Physiological research
	<i>Trematomus bernacchii</i>	McMurdo Sound	36 taken	
	<i>Parborlasia corrugatus</i>	McMurdo Sound	28 taken	
K066	<i>Gymnodraco acuticeps</i>	Cape Roberts	2 fin clip and release	Notothenioid fish evolution research
	<i>Trematomus bernacchii</i>	Cape Roberts	94 fin clip and release	
	<i>Trematomus hansonii</i>	Cape Roberts	3 fin clip and release	
	<i>Trematomus newnesi</i>	Cape Roberts	1 fin clip and release	
	<i>Trematomus nicolai</i>	Cape Roberts	14 fin clip and release	
	<i>Trematomus pennelli</i>	Cape Roberts	13 fin clip and release	
	Unidentified trematomid	Cape Roberts	1 fin clip and release	
	<i>Pagothenia borchgrevinki</i>	Cape Armitage	4	
	<i>Trematomus bernacchii</i>	Cape Armitage	20	
	<i>Trematomus newnesi</i>	Cape Armitage	5	
	<i>Trematomus pennelli</i>	Cape Armitage	24	
K122	<i>Pygoscelis adeliae</i>	Cape Bird	789 weighed, banded, PITs inserted, chicks measured	Population dynamics research
K140	<i>Isotoma klovstadi</i>	Cape Hallett	17,000 taken	Ecophysiology of springtails research
	<i>Cryptopygus cisantarcticus</i>	Cape Hallett	7000 taken	
	<i>Friesia grisea</i>	Cape Hallett	7000 taken	
	<i>Collembola, Mites, Tardigrades and Nematodes</i>	Cape Hallett	Number taken unknown	
	<i>Moss (Bryum sp?)</i>	Cape Hallett	15 samples 5-20mm diameter	Extraction of arthropods
	<i>Foliose Lichens</i>	Cape Hallett	25 samples 1cm diameter	

	<i>Freshwater Algae</i>	Cape Hallett	c.100	Collected with soil samples
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### Introduction of Non-Native Species

No non-native species were introduced, other than for food purposes.

# Environmental Information

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## Compliance with the Protocol

No new measures were adopted during the last year in accordance with Article 13 of the Protocol on Environmental Protection to the Antarctic Treaty. The Protocol is implemented in New Zealand legislation by the Antarctica (Environmental Protection) Act 1994.

## List of IEEs and CEEs

The following IEEs were considered for the 2002/2003 Antarctic summer season:

<b>Activity</b>	<b>Holder</b>	<b>Notes</b>
Tour expedition using the <i>Academik Shokalskiy</i>	Rodney Russ Heritage Expeditions Ltd (NZ)	Activity approved to proceed in accordance with IEE and conditions. Permits for entry into SPA 7, SPA 25, SPA 27, SPA 28 and SPA29 issued.
Tour expedition using the <i>Kapitan Khlebnikov</i>	Erica Wikender Quark (US)	Activity approved to proceed in accordance with IEE and conditions. Permits for entry to SPA 25, SPA 27, SPA 28 and SPA 29, issued.
Expedition to film Antarctic scenery and wildlife using the <i>RV Braveheart</i>	Nigel Jolly, owner of RV Braveheart (NZ)	Activity approved to proceed in accordance with IEE and conditions. No permits issued. (Addressed by Australia).
Scientific coring of Lakes Fryxell, Bonney and Joyce	Taylor Valley, McMurdo Dry Valleys	Activity approved to proceed in accordance with IEE and conditions.

## Monitoring Activities Report

The following environmental monitoring related to New Zealand activities was undertaken.

<b>Activity</b>	<b>Location</b>	<b>Procedures</b>	<b>Information</b>	<b>Action</b>
Liquid waste disposal	Scott Base	Weekly intake monitoring of faecal coliforms (colony forming units) and Biological Oxygen Demand (5 day).	FC below 10 CFU/100mg most weeks. On 7 occasions the New Zealand freshwater bathing quality guidelines (126 cfu/100ml) were exceeded, and in on 06 Feb 2003, CFUs were too numerous to count. This compares with 22 occurrences of FC exceeding the guidelines over the same period the previous year. These spikes are thought to relate to high base occupancy combined with sea ice pressure ridges preventing dispersal. BOD5 recording ceased in July due to equipment failure. The average was 2mg/litre, with a maximum of 6.6 recorded.	Waste Water Treatment Plant operational October 2002.
Fuel handling, storage and use	Scott Base and field operations	Volume of fuel stored and used monthly, by type. Number and locations of fuel spills.	Less fuel was purchased than the previous year, but overall usage is increasing. Three spills were reported, including "mogas" petrol totalling 60 litres and 2 litres of hydraulic fluid.	Vehicle with hydraulic failure repaired and tested. Petrol drums checked and moved to secondary containment.
Waste	Scott Base and field operations	Total waste disposed of to landfill in New Zealand recorded.  Analysis of waste generated at Scott Base conducted.	General waste (to landfill), only slightly higher than previous year, which was lowest in three years. The top three waste types returned to New Zealand were outdated furniture and equipment (30%) and construction waste (23%), both from the refit of Scott Base's 3A accommodation block, and food or food contaminated wastes (16%)	Waste reduction efforts to continue.

## Waste Management Plans

The following planning documents are in place for Scott Base and New Zealand field operations:

- **Antarctica New Zealand Waste Management Policy (updated March 2003)**
- **Antarctica New Zealand Waste Management Handbook (updated October 2001).**

During the past year, waste has been separated, stored, transported and disposed of in accordance with these documents. Efforts to minimise waste by source reduction are ongoing. All wastes other than sewage and domestic wastewater are returned to New Zealand for disposal (items recyclable within New Zealand are sent to appropriate agencies for recycling).

A wastewater treatment plant for Scott Base has been installed and became operational in October 2002.

## Relevant National Legislation

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No new legislation was adopted during the 2002/2003 period.

## Other Information

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### Inspection Reports

No inspections were conducted during the 2002/2003 season.

### Notice of Activities Undertaken in Case of Emergencies

**On the night of 2 Feb one member of the Event breached the Management Plan for ASPA 159 at Cape Adare by sleeping in the historic hut. The circumstances were as follows:**

- On 31 Jan katabatic winds started in the afternoon.
- On 1 Feb there was a southerly storm with severe gusts all night. The camp was lashed with driving salt and sea spray. Seawater soaked into the tents and through the sleeping mats and down sleeping bags.
- By the morning of 2 Feb large lumps of sea ice had landed in close proximity to the tents. Emergency sleeping bags were in varying states of wetness. Thermarests were extracted and used in the place of the sodden sleeping mats. The sleeping gear belonging to the member of the team on the windward side of the windward tent, was so wet the situation was considered in extremis. The decision was made for his safety for him to sleep in the loft of the historic hut on the evening of 2 Feb. The decision was conveyed to Scott Base by radio in advance.

## Permanent Information

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No additional information to be added since last update.