



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

Annual Report

13/14

The research reported herein is based on early analyses of complex datasets and should not be considered definitive in all cases. Institutions or individuals interested in all consequences or applications of AIMS' research are invited to contact the Director/CEO at the Townsville address given below.

For additional copies of this Report, please phone the Institute on 07 4753 4444, write to us at our Townsville address or email bookshop@aims.gov.au

This Report, along with a range of other information about the Institute, is available on-line at www.aims.gov.au

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TOWNSVILLE | DARWIN | PERTH

15 September 2004

The Hon. Peter McGauran MP
Minister for Science
Parliament House
CANBERRA ACT 2600

Dear Minister

On behalf of the Council of the Australian Institute of Marine Science, we have pleasure in presenting the Institute's 32nd Annual Report for the year ended 30 June 2004. The Report is forwarded in accordance with Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act).

This Report will enable you, the Parliament, and users of the Institute's research output to make an informed judgment about AIMS' performance during the 2003-2004 financial year.

The Report has been prepared in accordance with the Commonwealth Authorities and Companies (Report of Operations) Orders and the Commonwealth Authorities and Companies (Financial Statements 2003-2004) Orders. The Council endorsed the content of the Annual Report by a resolution of its meeting of 13 September 2004.

Yours sincerely

A E de Norbury Rogers A.O.
Chairman
Australian Institute of Marine Science

Dr Ian Poiner
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About the Australian Institute of Marine Science

The Australian Institute of Marine Science (AIMS), a Commonwealth Statutory Authority, is Australia's leading tropical marine science research agency.

AIMS scientists conduct research, often in collaboration with other local, national and international agencies, into aspects of marine conservation and biodiversity, marine biotechnology and coastal processes. Surveys and analyses are carried out at the molecular, organism and ecosystem levels, both in the field and in an array of world-class laboratories and workshops.

Through these activities, AIMS researchers are helping to ensure that the use of precious marine resources is consistent with the long-term needs of all Australians.

MISSION

To generate and transfer the knowledge to support the sustainable use and protection of the marine environment through innovative, world-class scientific and technological research.



THE EXPOSED RIBBON REEFS OFF LIZARD ISLAND HAVE RECOVERED WELL AFTER BEING DENUDED OF CORAL BY A CYCLONE IN 1990

Highlights

- Surveys conducted in offshore Marine Protected Areas, the Great Barrier Reef World Heritage Area, and the Oceanic Shoals Bioregion, have revealed many new species and new records of species for particular regions. These surveys highlight the limits of our current information on the biodiversity of our marine ecosystems.
- An agreement to establish AIMS@JCU, a framework for an unincorporated joint venture between AIMS and James Cook University, was signed. This arrangement facilitates collaboration between the two organizations, and increases Townsville's profile as Australia's centre of excellence in tropical marine research and education.
- Low-technology methods for growing sponges, developed by researchers at AIMS, are being adapted to suit local species and conditions and subsequently adopted in projects that explore the potential for a bath/industrial sponge aquaculture industry in remote indigenous communities. Through linkage to existing indigenous labour market programs, such as the Sea Ranger and Community Development Employment Programs, opportunities for indigenous community members to participate in the projects have been maximised, ensuring skills and knowledge are transferred effectively.
- The novel application by AIMS researchers of epidemiological methods to the analysis of environmental issues has led to the development of a means of establishing the causal links between terrestrial runoff, inshore water quality and the health of adjacent coral reefs.
- Parallel work on marine organisms undertaken in the Great Barrier Reef region and Antarctica has led to the development of ways of identifying sub-lethal stresses in marine organisms. These provide early warning of relatively low levels of environmental contamination that, nevertheless, can have significant impacts on the health of marine organisms.
- Research to investigate the effects of the commonly used agricultural chemical diuron on coral recruitment has shown that it, as well as less toxic bio-oils, decreased the growth of juvenile corals.



- Bio-indicators of water quality were developed to assist the *Catchment to Reef* project, a project undertaken by the Cooperative Research Centre for the Great Barrier Reef World Heritage Area and the Cooperative Research Centre for Tropical Rainforest Ecology and Management to improve the quality of water draining from coastal catchments into the waters of the Great Barrier Reef.
- Research has found that a difference of only 0.5-1°C determines whether coral bleaches or dies as a result of increased water temperature. Related research suggests that 'shuffling' of the dominant type of algae (zooxanthellae) living in the tissue of a coral can influence the coral's tolerance to increases in water temperature of 1-2°C. However, this increased heat tolerance comes at the cost of decreased growth or reproductive capacity. These discoveries will assist national policy decisions associated with climate change and sustainable reef management.
- Seventeen compounds with the potential to be developed as commercial herbicides were isolated from marine organisms as part of collaborative work between AIMS, James Cook University and the agrichemical company Nufarm Pty. Ltd.
- Two anti-tumour leads isolated from marine samples collected by AIMS are poised for preclinical trial by the United States National Cancer Institute.
- AIMS scientist Dr J.E.N. (Charlie) Veron was honoured for his life-long dedication to coral reef conservation, being awarded the International Society for Reef Studies' most prestigious award, the Darwin Medal. Fellow AIMS scientist Dr Eric Wolanski was awarded the title 'Doctor Honoris Causa' by the Catholic University of Louvain, Belgium, one of Europe's oldest universities.
- AIMS and CRC Reef launched *Reef Futures* (www.reeffutures.org), an interactive website that enables users to explore possible scenarios for coral reefs of the Great Barrier Reef under different levels of global warming and reef management. It also delivers introductory information, US National Oceanic and Atmospheric Administration bleaching maps, and data on a wide range of coral reef issues.

Report of Operations

Certification of Report of Operations
Council's Review of Operations
Special Report
Operational Performance
Corporate Overview

Report of Operations



Australian Government

AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE | DARWIN | PERTH

Certification of Report of Operations

The Council of the Australian Institute of Marine Science is responsible under Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act) for the preparation and content of the Australian Institute of Marine Science's Report of Operations, in accordance with the Finance Minister's Orders.

Council endorsed the content of the Institute's Report of Operations by a resolution of its meeting of 13 September 2004.

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Chairman
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Council's Review of Operations

Australia's tropical marine landscape is a vital part of our national identity as well as an important economic resource – reflected in industries such as tourism and fisheries, and commodities such as oil and gas. For AIMS, Australia's leading tropical marine science research agency, 2003-2004, the first year in the Institute's Research Plan for 2003-2006, was busy and productive. A wealth of new research was initiated, and continued emphasis was placed on collaboration and partnerships with stakeholders and other researchers in order to deliver research outcomes supporting the sustainable use and protection of Australia's tropical marine resources.

In working to deliver these outcomes, AIMS was, again, mindful that it operates within a political and social context that places increasing value on the sustainable use of Australia's natural resources and on protection of the environment. At the same time, it continued to acknowledge the validity of increasing scrutiny by governments and the community of how effectively the money provided for research is used - are research goals attuned to national needs, are infrastructure and intellectual capacity used effectively, and are the commercial benefits of research identified and captured? During the past year, AIMS, working with government and other key stakeholders, continued to align its activities and linkages so as to meet these national requirements for effectiveness and efficiency.

A particular milestone during the year in this regard was the signing of a joint venture agreement between AIMS and James Cook University (JCU), which was facilitated by the Australian Government. Known as AIMS@JCU, the arrangement promotes increased

collaboration between the Institute and the University, increases the effective use of infrastructure and provides improved training opportunities, thus further establishing Townsville as an international centre of excellence in tropical marine research and education, and attracting investment and expertise to the area.

The year also saw excellent progress in developing AIMS activities in Darwin by way of the joint venture between AIMS and the Australian National University – the Arafura-Timor Sea Research Facility. A Chief Executive Officer was appointed and, courtesy of a \$3.25m grant under the Major National Research Facilities program, work began in May on construction of the laboratories. The laboratories will support up to sixteen researchers and were designed after extensive discussions with Northern Territory Government agencies and Charles Darwin University so as to provide increased capacity for the north.

Western Australia continues to present opportunities for AIMS to grow its research and to maximise the impact and uptake of our outputs. Recently, Premier Gallop announced that the WA Government will spend \$5 million over 4 years on a focused research program for the Ningaloo Coast. The program is to help protect the Ningaloo Reef and associated species by providing a better understanding of their conservation needs. This is an opportunity to continue to build AIMS WA. We are working with the Office of Science and Innovation, Department of the Premier and Cabinet and other WA departments, CSIRO and the Universities to maximize the impact of the State Government's investment by developing collaborative projects involving State Government departments, Commonwealth agencies, the Universities and industry.

The restructuring of our research portfolio that occurred over the past 18 months has provided an excellent opportunity to further align our research with the National Research Priorities announced by the Australian Government in late 2002.

- Our marine biotechnology initiatives involve frontier science directed toward new technologies and products derived from marine organisms.
- Our strong international linkages, both at Institute and scientist level, and our research activities, predominantly within the region, provide support for critical infrastructure and a greater level of understanding and co-operation with Australia's neighbours.
- AIMS plays a central role in working towards an environmentally sustainable Australia; this involves increasing the understanding of the effects of land-based activities on our marine resources and environment, analysing and predicting the effects of climate change, and focusing on the knowledge needed for the sustainable exploitation of Australia's biodiversity.

Our marine environment is under increasing threat, particularly where urban, agricultural and industrial developments have negative impacts on estuaries and coastal waters, and on the sustainability of living resources. The Institute's historical capability in water quality studies provided strategic leadership in the development of water quality guidelines and

the *Reef Water Quality Action Plan*. During the year, consultation with managers provided important input into the development of strategies to monitor how well this important Commonwealth-State initiative is protecting the Great Barrier Reef World Heritage Area.

A further major focus of our effort to improve sustainable coastal development was an integrated study of Darwin Harbour. This research was developed in close consultation with other agencies in the Northern Territory, and, in collaboration with these agencies, is contributing significantly to this important region.

This annual report documents many achievements in relation to our research on coral reefs, especially the impact of climate change on corals. This work is being advanced through the development of a strategic alliance with the US National Oceanic and Atmospheric Administration, the Great Barrier Reef Marine Park Authority and the University of Queensland. Our research not only contributes to knowledge of the impacts of climate but also tracks trends in the tropical physical environment and helps to improve global models of climate variation.

More recent effort to better describe the biodiversity of seabed communities is showing just how much remains to be discovered in relation to marine resources, with many new species, and new records of species for particular regions, being identified from research activities during the year. This information is critical for managers, and AIMS is working closely with Commonwealth and State agencies to ensure this information is available for their planning.

By integrating emerging molecular technologies with existing technologies, AIMS is at the forefront of developing innovative tools for application in areas of environmental management and human health. An example of the successful integration of these disciplines is the study of heat stress in corals that provides a means of monitoring the effects of environmental stress and predicting how corals may respond and adapt to rising water temperatures.

Ongoing efforts by AIMS to capture emerging opportunities in regional Australia had outstanding success during the year. The translation of practices used to provide sponges for research application to a potential indigenous commercial sponge industry is the result of successful links built between researchers, regional development bodies and indigenous communities. Work is continuing to further this opportunity, that will increase employment in the indigenous communities of northern Australia.

AIMS research also includes efforts to discover useful products from Australia's marine biodiversity and, again, AIMS has successfully built partnerships to improve the ability to capture benefits through the sustainable use of these resources. During the year, AIMS negotiated an agreement with a European pharmaceutical company, Faustus Forshungs Compagnie, specifically targeted at achieving this outcome. Particularly notable, also, is the leadership role taken by AIMS in negotiating agreements with State governments related to the sharing of benefits derived from marine biodiversity.

The strength of an organisation such as AIMS will always depend on the excellence of its scientific endeavours. The Institute continues to be at the forefront in tropical marine science on a global basis, and has been recognised in the top 1% of specialist research institutions making an international impact. The ranking, based on an analysis of journal publications conducted by Thomson ISI Web of Science, reflects AIMS' contribution to Australia's research excellence. AIMS scientists continue to receive international recognition through prestigious awards, and invitations to present Australian science in major scientific fora, and to serve with peak bodies determining policies for national and international research and environmental management.

A further key to the strength of AIMS is its management. After an important contribution to the realignment of AIMS research activities and management structures, Professor Stephen Hall resigned as Director/CEO of AIMS in February 2004 in order to assume the prestigious position of Director-General of the WorldFish Center, in Penang, Malaysia. Thanks are extended to Stephen for his contribution to AIMS over the period November 2000 to February 2004. Mr Peter Willers took on the role of Acting Director/CEO of the Institute from February, providing strong and effective leadership during a time in which vital commercial negotiations and joint venture agreements were progressed and finalised.

The Council was delighted to secure the services of Dr Ian Poiner as the new Director/CEO of AIMS. Dr Poiner is an eminent marine researcher, widely recognized for his work on identifying and mitigating the environmental impacts of fishing, evaluating marine management strategies (including ecosystem level approaches), and understanding how tropical marine systems are influenced by the impact of human activities, the environment and climate factors. His reputation and experience in science leadership will bring a strong focus on collaboration, and an emphasis on the building of new partnerships for the Institute. The Council looks forward to an exciting future for AIMS under its new Director/CEO, who took up his position in July 2004.

Operations during the year occurred on the basis of a one-off funding arrangement, with the Government providing appropriation funding for the fiscal year 2003-2004 only. We are pleased to be able to report a restoration of a triennium funding agreement for the three financial years 2004-2007. This provides some certainty for the Institute and is vital to the development of the strategic longer-term research so important for building an environmentally sustainable Australia.

In ensuring effectiveness of the Institute's research program it is relevant to note that research entails a degree of uncertainty; outcomes cannot be guaranteed. In order to manage this risk, AIMS engages world-class scientists and maintains strong networks with scientists around the globe, exchanging information, keeping abreast of research results, developing world-class research facilities and technology, and consulting with peers and stakeholders to identify the research and research approaches most likely to deliver the desired outcomes

and contribution to national benefit. Increasingly, the expectation to capture the benefits from intellectual property and to commercialise research means that the Institute faces risks similar to those faced by commercial operators. The Institute copes with these risks by strengthening its financial and corporate management framework, including using consultants as and when considered necessary, and maintaining robust management and audit processes. During the year, following a review of the Institute's commercial needs, the Commercial Services Unit was formed. This Unit provides advice and develops policy and procedures to ensure effective management of the Institute's intellectual property portfolio, and the commercially sound transfer of AIMS research outcomes and outputs to third parties.

It is timely to publicly thank two of our Council Members, Dr. Wendy Craik, whose connection to the resource sector greatly aided the setting of strategic directions, and Mr. Brian Guthrie, whose links to the Townsville business community were invaluable. The terms of these two Members concluded on 30 June. Their efforts over the last seven and six years respectively, and their contribution to the Institute's strategic oversight are greatly appreciated.

Once again, AIMS staff, our most valued asset, have demonstrated their expertise and leadership in marine science. All AIMS staff are thanked and congratulated for their work – in scientific research, teaching, community consultation, and, the less-often acknowledged but equally important, areas of science support and administration. Thank you to all the staff whose expertise, commitment and effort have enabled AIMS to carry out its work efficiently and effectively for the benefit of all Australians.



**AIMS COUNCIL MEMBERS DR IAN GOULD, DR WENDY CRAIK,
DR MERILYN SLEIGH, DR IAN POINER (AIMS DIRECTOR),
MR NORBURY ROGERS (CHAIRMAN) AND MR BRIAN GUTHRIE**



ANTI-CLOCKWISE FROM TOP LEFT: BRANCHING ACROPORA, GALAPAGOS SHARK, BLACK TEAT FISH AT ELIZABETH REEF, AUSTRALIAN CUSTOMS SERVICE CREW RETRIEVE A TENDER DURING AIMS MARINE SURVEY AT MAGDELAINE CAY. BELOW: COMMONWEALTH MARINE PROTECTED AREAS SURVEYED BY AIMS FOR THE DEPARTMENT OF THE ENVIRONMENT AND HERITAGE.





Special Report: *Helping to manage Australia's remote Marine Protected Areas*

Australia's Marine Protected Areas (MPAs) are areas of outstanding environmental value and high biodiversity and are, thus, of outstanding importance to the nation.

This importance requires that MPAs be given very high levels of protection; hence most are managed by the Australian Government Department of the Environment and Heritage (DEH) in accordance with individual management plans. Nine of the thirteen contain coral reefs, and, with the exception of the Solitary Islands, all are geographically isolated, a fact that makes visits logistically and financially difficult. In the past two years AIMS, in collaboration with DEH, has conducted marine surveys in eight of the nine coral reef MPAs – from Ningaloo in the southwest through to Lord Howe Island in the southeast of Australia – in order to identify the values and habitats they contain. Survey techniques included mapping of the seafloor, towed underwater videoing and sampling of material. Ongoing monitoring will help DEH achieve management goals, and evaluate and refine its work in these areas. Access by AIMS to the most isolated of these MPAs was made possible by the Australian Customs Service, which provided its 35m Bay Class vessels as diving and research platforms.

Findings that have been of particular value to DEH included evidence that:

- Despite its isolation from human activity, cover of living hard corals in the Coringa-Herald National Nature Reserve was very low (average 2.9%). There was evidence that a lot of corals had died recently as a result of coral bleaching. Living coral cover was also low at Lihou Reef (average coral cover 7.9%) and up to 90% of this was bleached. Coral cover at Elizabeth Reef was moderate (average 25%).

- The population of black cod (*Epinephelus daemeli*) at Elizabeth Reef, which provides a sanctuary for the species, was largely unchanged from when it was first assessed in 1987; black cod were widespread along the NSW coast until fishing pressure reduced numbers.
- The lagoon at Elizabeth Reef, which was found to contain large numbers of young Galapagos sharks (*Carcharhinus galapagensis*), may provide an important nursery area for these sharks, which in Australian waters are only known from Elizabeth and Middleton Reef Reserves, and Lord Howe Island.
- Very high densities of the commercially valuable black teat fish (*Holothuria whitmaei*) were found at several sites on Elizabeth Reef. A density of 307 per hectare was observed at one site. While the 'clumping' nature of this species suggests the figure should be treated with caution, this is the highest density ever recorded in Australian waters and may typify a reef which has never been subjected to fishing pressure.
- A diverse assemblage of plants and animals associated with both hard and soft substrates exists in Lord Howe Island deeper water communities (30-200m). Preliminary surveys conducted around the Island in February 2004 suggested that habitats appear to be in good condition. As at Elizabeth Reef, there was a high abundance of Galapagos sharks. This contrasts with all other marine parks AIMS has surveyed around Australia, where shark numbers are considerably lower.
- Twelve Ballina angelfish (*Chaetodontoplus conspicillatus*) were found in the waters around Lord Howe Island. This species is considered to be very rare, and the relatively large number found suggests that, below the depth limits of SCUBA diving, these fish may be more common than previously thought.
- Past fishing pressure from Indonesian fishers is a key factor behind the very low numbers of sea cucumbers and trochus at Cartier Reef.
- Densities of black teat fish (*Holothuria whitmaei*) at Ashmore Reef (<1/ha) are quite low compared with those at Mermaid Reef (~10/ha), suggesting slow population recovery following fishing bans imposed at Ashmore Reef.
- Widespread coral bleaching at Ashmore and Cartier Reefs occurred in 2003, with approximately 50% mortality in the scleractinian coral population since surveys in 2000.
- There are hotspots of benthic community biodiversity at all depths of Ningaloo Reef. The sponges are widespread in the deeper water (25-200m) and differ from those found at other sites in northwestern Australia (in particular the Dampier Archipelago).

The results of the Institute's surveys feed directly into the performance assessment and management control framework of the Department of the Environment and Heritage and help to ensure the effective management of Australia's Marine Protected Areas.

Operational Performance

Introduction
Conservation and Biodiversity Group
Coastal Processes Group
Marine Biotechnology Group
Achievements against Performance Indicators
Outcome and Output Structure

Operational Performance



RECOVERING WATER TEMPERATURE LOGGER AT POMPEY REEFS



Introduction

The government invests in AIMS because it recognises both the contribution of marine research and development to national prosperity and the need to encourage ecologically sustainable development of marine industries – including new industries, such as aquaculture and those based on marine biotechnology.

To deliver a return on this investment, AIMS:

- conducts world-class marine science and technology research supporting Australia's National Research Priorities;
- provides credible, independent information, products, and advice tailored to guide decision-making;
- supports sustainable development of existing businesses, by providing knowledge, products and services; and,
- identifies and develops new opportunities for economic development.

AIMS delivers its research through three skills-based research groups – the Conservation and Biodiversity Group, the Coastal Processes Group and the Marine Biotechnology Group. The Institute's research is selected to meet Government policies, initiatives and priorities (including Australia's Oceans Policy, Backing Australia's Ability and the National Research Priorities), and the needs of stakeholders, clients (including industry), other research agencies, marine resource managers, governments and the Australian community.

The current reporting year is the first year of the Institute's 2003-2006 Research Plan. To deliver on the Plan, nine research teams were established to cover the following broad fields of endeavour:

- Biodiversity assessment in new areas;
- Climate change;
- Risk and recovery;
- Status and trends;
- Sustainable coastal development in northern Australia;
- Water quality in the Great Barrier Reef World Heritage Area;
- Bio-active molecule discovery;
- Bio-innovation; and,
- Tropical Aquaculture.

The nine research teams have developed their research goals and implementation plans to complement and support other research activities and maximise national benefit. The approach has been to build strong multidisciplinary teams within AIMS and use extensive collaborative networks to build critical mass, draw in external support, and effectively use resources.

CONTRIBUTION TO THE NATIONAL RESEARCH PRIORITIES

As outlined in *AIMS' Implementation Plan 2004*, the Institute's research program is strongly aligned with the National Research Priorities. Our contribution to the priority goals within the National Research Priorities is shown in the table opposite.

Each of the priority goals in an *Environmentally Sustainable Australia* is underpinned by the Institute's research. Of particular relevance during the reporting period was research investigating the impact and tolerance of corals to increases in water temperature (*Responding to climate change and variability*); assessment of seabed biodiversity, determination of the status of marine ecosystems, and research into the impact of agricultural chemicals and human activities on our coral reefs and water quality (*Sustainable use of Australia's biodiversity*); and research into aspects of sustainable aquaculture (*Transforming existing industries*).

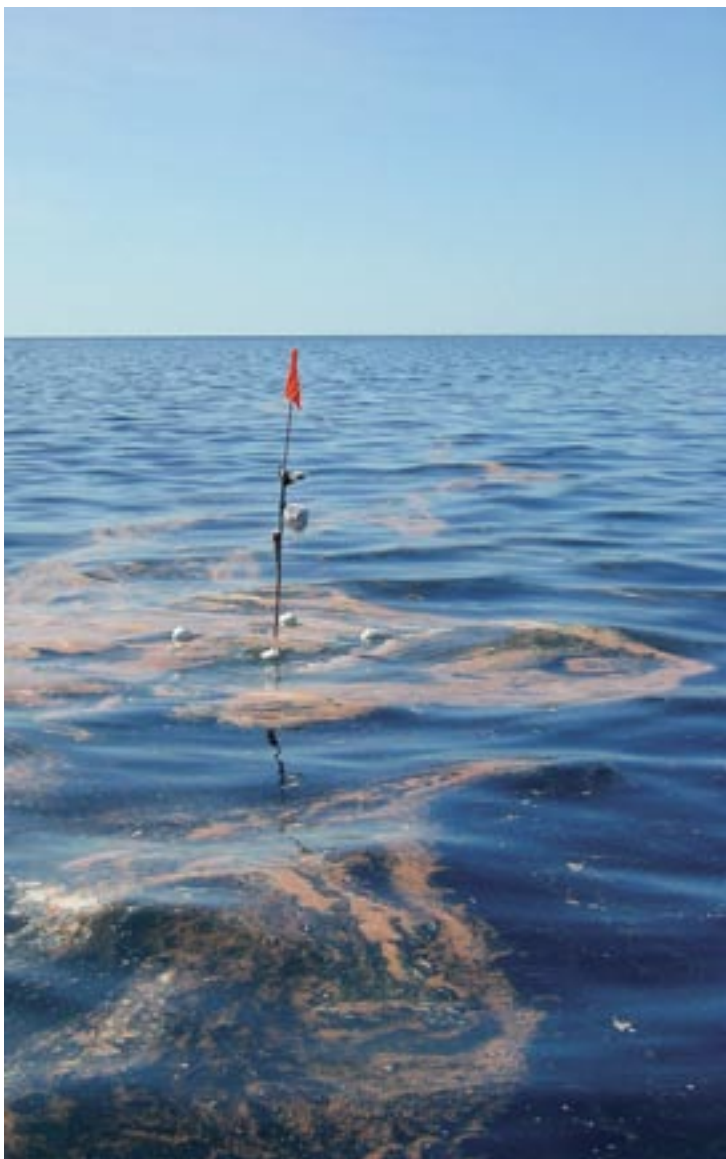
Addressing the National Research Priority of *Promoting and Maintaining Good Health*, AIMS continued its successful search for marine biochemicals with the potential to combat diseases associated with ageing, to fight tropical diseases, such as leprosy, and potentially fatal bacteria such as *E. coli*, and to be developed into as anti-cancer and anti-tumour agents. This research contributes to priority goals *Ageing well*, *ageing productively* and *Preventive health care*.

The National Research Priority of *Frontier Technologies for Building and Transforming Australian Industries* was supported through research applying molecular technologies to promote advances in prawn and lobster aquaculture (*Frontier technologies, Promoting an innovation culture and economy*). Biochemical research has also led to the development of a low-technology sponge aquaculture industry amongst communities of indigenous people in northern Australia. In addition, research into the development of new herbicides is contributing to the National Research Priority of *Safe-guarding Australia*.

A summary of the alignment between the objectives of AIMS Research Teams and the National Research Priorities. Values in parentheses against AIMS Research Teams indicate the level of appropriation investment in each area.

National Priority	Environmentally Sustainable Australia					Promoting and Maintaining Good Health		Frontier Technologies for Building and Transforming Australian Industries					Safe-guarding Australia
Priority Goals	Water – a critical resource	Transforming existing industries	Reducing and capturing emissions in transport and energy generation	Sustainable use of Australia's biodiversity	Responding to climate change and variability	Ageing well, ageing productively	Preventive health care	Breakthrough science	Frontier technologies	Advanced materials	Smart information use	Promoting an innovation culture & economy	Protecting Australia from invasive species
Biodiversity Assessment in New Areas (\$4.89m)				***	*						*		
Climate Change and Impacts (\$3.11m)			**	**	***								
Risk and Recovery (\$2.60m)				***	***						*		
Status and Trends (\$3.91m)				***	*						*		
Sustainable Coastal Development for Northern Australia (\$2.67m)	*			***	*				*				
Water Quality on the Great Barrier Reef (\$4.45m)				***	*				*		*		
Bio-active Molecular Discovery (\$1.67m)		*		*				**	***		*		*
Bio-Innovation (\$1.78m)	*	*		*	*	*	*	**	***			***	*
Tropical Aquaculture (\$3.21m)		**		**					**	*		***	

Key: *** Highly Relevant – intended outcomes and planned activity directly focused on priority goals.
 ** Very Relevant – intended outcomes and activity closely related to priority goals, but also focused in related areas.
 * Relevant – intended outcomes and planned activity related and likely to contribute to priority goals.



**AN OCEANOGRAPHIC DRIFTER FLOATING IN CORAL SPAWN SLICK AT
SCOTT REEF, WESTERN AUSTRALIA**



Conservation and Biodiversity

Research scientists in the Conservation and Biodiversity Group focus on assessing biodiversity in new areas; climate change; levels of risk and recovery potential for the marine environment; and the current and potential health of marine resources. The interdisciplinary research delivered by the Group is achieved through collaboration both within the Institute and with external agencies. The Group's research activities are contributing to two of the National Research Priorities: *Environmentally Sustainable Australia*, and *Frontier Technologies for Building and Transforming Australian Industries*.

In support of *Environmentally Sustainable Australia*, research was aimed at better understanding how coastal shelves contribute to the global carbon budget; how marine biodiversity is generated and maintained; and how species respond to climate variability and climate change. This work simultaneously supported Australia's Oceans Policy and the work of various international working groups.

To further *Frontier Technologies for Building and Transforming Australian Industries*, the Group used the latest in statistical theory to develop improved ways of assessing risk and constructing models of future scenarios. From this work will come tools to assist managers make better decisions about the sustainable use of natural resources. Some highlights from the reporting period are described on the following page.

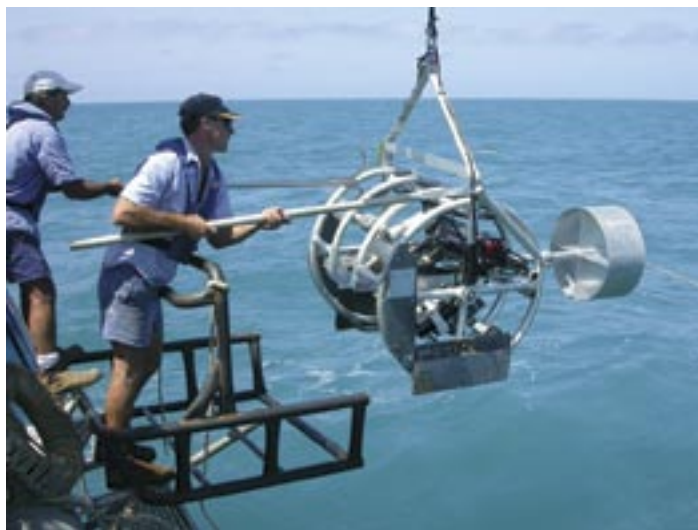
Research highlights

BIODIVERSITY OF THE OCEANIC SHOALS

The Oceanic Shoals Bioregion to the north of Australia is a unique tropical marine environment that, until recently, had received almost no scientific attention. During 2003-2004, AIMS scientists visited the area five times in order to document physical, chemical, and biological aspects of this complex remote habitat and to increase knowledge of the diversity of Australia's marine resources. Biological surveys, including benthic surveys, were carried out using a series of remotely operated, video-based tools (some developed in-house) that can sample biodiversity without causing damage. Data collected to a depth of 100m showed that algal and coral communities were dominant components of the benthos down to depths of 55-60m, with the most abundant communities often observed in depths below 30m. While analysis is still underway, the data are already providing new information from this region, contributing to our understanding of the environment, its processes and optimal management, and potentially delivering materials of direct benefit to human welfare. While data are still being studied, early analysis is already providing new information from this region (e.g. some new fish species records for Australian waters).

SEABED BIODIVERSITY IN THE GREAT BARRIER REEF WORLD HERITAGE AREA

Most of the Great Barrier Reef World Heritage Area (GBRWHA) comprises habitats other than coral reefs (e.g. seagrass meadows, sand flats, algal gardens, submerged shoals). To date, these habitats have received little attention. During 2003-2004, researchers from



DEPLOYING A TOWED VIDEO CAMERA

AIMS, in collaboration with CSIRO Marine, the Queensland Museum and the Queensland Department of Primary Industries and Fisheries (QDPIF), successfully completed the first year of fieldwork of a new study to map these habitats and their associated biodiversity. Even at this early stage, samples obtained are providing new information for the GBRWHA, with up to 50% of some samples being either new species, or species previously unknown in the Great Barrier Reef (GBR) region.

ALGAL-CORAL SYMBIOSES IN THE FACE OF CLIMATE CHANGE

The status of coral reefs around the world, including Australia, is causing widespread concern in professional and lay circles. Their destruction would have major negative physical and economic impacts; even a change in their status could necessitate significant



EXTRACTING GENETIC MATERIAL

adjustment in ecological processes and human activity. During 2003-2004, as a means of understanding the process of coral bleaching, researchers studied the role of symbiotic algae (zooxanthellae) in coral during bleaching events. They identified for the first time that, in the coral *Acropora millepora*, thermal tolerance and coral growth is dependent on the type of zooxanthellae harboured by the coral. Adult *Acropora millepora* corals can acquire increased thermal tolerance by changing their dominant zooxanthella type. However, even after changing to the most thermally tolerant zooxanthella type, the level of increased tolerance gained is only 1-2°C – enough to ‘buy time’, but possibly not enough to survive likely levels of climate change under predicted climate scenarios for sea surface temperatures over the next 100 years.

Researchers also demonstrated that bleached coral will die if water temperature increases by only a further $\sim 0.5\text{--}1^{\circ}\text{C}$.

These discoveries contribute a significant piece of the puzzle about how the GBR responds to climate change, and will greatly assist national policy decisions associated with climate change and sustainable environmental management.

MONITORING CURRENT CLIMATIC CONDITIONS AND MODELLING THEIR IMPACTS

Understanding how coral reefs are responding to climatic variations increases our abilities to predict how they will respond in the future. Current trends in the physical environment of coral reefs are monitored through *in situ* automatic weather stations, tide and current gauges, temperature loggers and satellite observations. Our understanding of coral bleaching significantly advanced during the year, with monitoring work done at Scott Reef in Western Australia and in Palau, Micronesia. The observations made will provide a more detailed understanding of how hydrodynamics control the spatial variability of heat stress associated with coral bleaching. This research involved significant international collaborations with the United States National Oceanic and Atmospheric Administration (NOAA) and The Nature Conservancy.



AUTOMATIC WEATHER STATION AT MYRMIDON REEF

UNDERSTANDING THE BIOLOGICAL AND CHEMICAL DYNAMICS OF THE GULF OF PAPUA

As they flow into the sea, rivers in the wet tropics drive the chemical composition of the ocean, contribute to greenhouse gas budgets, and greatly influence global climate. The process can differ markedly between rivers. For example, in the wet tropical muddy shelf of the Gulf of Papua, extremely efficient biological and chemical reactions serve to trap most



REMOVING A KASTEN CORE

river inputs on the inner shelf. Patterns of genetics, abundance, and biological growth rates of the bacterial and macrobenthic organisms in the Gulf support the hypothesis that, in this area, a great genetic diversity of microbes dominates the system and leads to the near complete decomposition of organic matter produced and delivered by river catchments and shelf marine ecosystems. In contrast, on the GBR shelf, macrobenthic organisms (e.g. algae, clams, starfish, fish) are abundant, and rates of organic matter supply from terrestrial and marine sources slightly exceed rates of decomposition. During 2003-2004, AIMS scientists continued a long-term collaboration with scientists from other agencies in Australia, Indonesia, Papua New Guinea, and the United States, to investigate how riverine input is dispersed and trapped in coastal oceans, and how these processes affect greenhouse gas sources and sinks, and the productivity of these waters.

LONG-TERM MONITORING OF THE STATUS OF THE GREAT BARRIER REEF

The value of AIMS' long-term monitoring of the GBR, which continued during the year, was once again proven. Outbreaks of the Crown-of-thorns starfish (COTS) occur in waves that start north of Cairns and progress south, as the East Australia Current carries larvae from reef to reef. AIMS started monitoring the distribution of outbreaks of COTS in 1986, when

the second recorded wave had reached the reefs near Townsville. The third recorded wave of outbreaks reached the reefs near Townsville in 2003-2004, so, for the first time, it was possible to compare two waves of outbreaks on reefs in the same region using the same survey methods. The comparison suggested that successive waves of outbreaks are not becoming more intense.

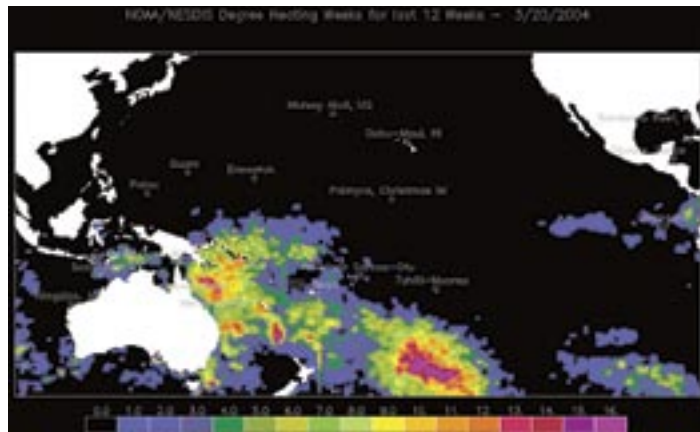
Other outputs

- Research delivered evidence that the 1998 coral-bleaching event had a sustained impact on growth rates of massive, inshore *Porites*. This has implications for the long-term impacts of bleaching on the GBR.
- A novel combination of a water column turbulence model and a two-dimensional hydrodynamic model that describes the relationships between current, heat stress and coral bleaching was developed and validated at Scott Reef.
- A survey of corals off Arnhem Land, undertaken for the National Oceans Office, provided new information on coral biodiversity in northern Australia, going some way to filling a current knowledge gap.
- The *Reef Futures* website (www.reeffutures.org), an interactive website that enables users to explore possible scenarios for coral reefs of the GBR under different levels of global warming and reef management, was launched.
- Data from the ongoing long-term study at Scott Reef in Western Australia showed that recovery of Scott Reef corals following the catastrophic bleaching event in 1998 is going to take decades. Ongoing surface current modelling and research on early life histories of corals show the slow recovery is a result of the geographical isolation of the reef.
- New surveys of the inshore reefs of the GBR provided a benchmark against which future changes in these reefs can be assessed, and on which management decisions can be based. These reefs should be the first to respond to the improved quality of waters discharging onto the reef as actions are undertaken under the *Reef Water Quality Protection Plan* – a Commonwealth/State initiative for which AIMS provided data and expert advice – and the data will help assess and refine the Plan.

Outcomes for stakeholders

- The new zoning of the Great Barrier Reef Marine Park (GBRMP), passed by Parliament in March 2004, integrated significant scientific advice from AIMS researchers. The Representative Areas Plan increased protection for all bioregions in the Park.
- AIMS staff helped deliver near real-time monitoring of thermal conditions associated with bleaching and information on the potential for bleaching of the GBR during the 2003-2004 summer season. This information was used by the Great Barrier Reef Marine Park Authority (GBRMPA) in development of its *Bleaching Response Plan*, and integrated into its management of the Reef.

- Aerial surveys of the 1998 and 2002 bleaching events on the GBR were combined with high-resolution satellite data to determine that the 3-day maximum sea surface temperature predicts the occurrence of bleaching on the GBR with ~70% accuracy. This additional information enhances the application of satellite data by GBRMPA, which uses it, together with *in situ* observations, to assess the risk of bleaching during the summer season.
- Improved information on Commonwealth Marine Protected Areas provided by AIMS through surveys for the Department of the Environment and Heritage (DEH) is being used in the performance assessment of these marine estates (see Special Report, page 13).



A NOAA/NESDIS DEGREE HEATING WEEKS PRODUCT SHOWING THE ACCUMULATED HEAT IN CORAL SEA WATERS LAST SUMMER



COLLECTING SEDIMENT FOR CONTAMINANT ANALYSIS



Coastal Processes

AIMS' Coastal Processes Group is made up of researchers with skills particularly relevant to researching the impact of human activity on coastal waters. Within this broad field, two issues of major importance to Australia – water quality in the GBRWHA and sustainable coastal development in northern Australia – formed the focus of work during the year. In line with an increased focus on northern Australia, research linkages were forged with Darwin-based research institutions and stakeholders.

As with all AIMS research, the work of the research teams in the Coastal Processes Group is closely aligned with Australia's National Research Priorities. The *Environmentally Sustainable Australia* priority is supported through research designed to help achieve the priority goals of *Sustainable use of Australia's biodiversity*, *Water – a critical resource* and *Responding to climate change and variability*. The work of the Group also supports the *Frontier Technologies for Building and Transforming Australian Industries* priority.

How we use our coastal zone, as well as natural processes, determines the environmental health of our coastal areas, including the GBR. The work carried out under the auspices of this Group improves the understanding of processes acting within our coastal zone, assisting decision-makers to develop policies and plans for the sustainability of industries and our environment.

Research highlights

LAND-BASED THREATS TO THE GREAT BARRIER REEF

Sedimentation resulting from soil erosion in the catchments adjacent to the northeast coast of Australia, including those of the Wet Tropics World Heritage Area (WTWHA), has a significant impact on the GBR. Field studies have demonstrated, for example, that up to 1000 tonnes of sediment per day can flow out of Trinity Bay, in Cairns, with some of this sediment being exported up to 20 km offshore towards the Reef. A model has been developed to track the outflow of mud from Trinity Bay, and its export to the GBR.

During 2003-2004, seven river systems were monitored for suspended sediment. Modelling work currently in progress, conducted in partnership with James Cook University (JCU), indicates that mixing of nutrients across the shelf occurs mostly within the coastal boundary layer and during significant flood events.

One indicator of high sediment load is decreasing water clarity; between 1927 and 2000, mean water visibility near Low Isles, a mid-shelf reef north of Cairns, appears to have halved. Such a reduction is significant for human use (for example, it decreases the tourism value of reefs) and for ecological function.

During the year, AIMS' Hydrology, Oceanography, Meteorology and Ecology (HOME) model, was refined. The model suggests that, over the last 60 years, human activities have significantly degraded reef health. The model offers a predictive tool to quantify how much reef health can be expected to improve as a result of remediation measures on land. This model has been under ongoing refinement as further data on the GBR are incorporated in order to increase robustness.

LAND-DERIVED SEDIMENT AND NUTRIENTS AND THE GREAT BARRIER REEF

Fieldwork undertaken in 2003-2004 has increased the understanding of nutrient and sediment processes in coastal runoff and the impact these processes have on the physical environment of the GBRWHA. Studies were conducted in inshore areas adjacent to agricultural watersheds in the Cairns sector, and in a non-agricultural nominal control area, Princess Charlotte Bay. In addition, nine inter-reefal areas of the central GBR were selected as sites at which AIMS scientists would measure nitrogen and carbon cycling in sediments. Data collected from these sites will be used, in conjunction with AIMS' historical data, to complete modelling of carbon and nitrogen cycling on the GBR shelf. This work is contributing to our understanding of how marine processes in a relatively narrow coastal strip, particularly those associated with mangroves and other intertidal habitats, trap, transform and store sediment and organic matter within the GBRWHA.



**MEASURING OCEAN COLOUR SPECTRA FOR COMPARISON WITH
SATELLITE DERIVED DATA**

LONG-TERM CHLOROPHYLL MONITORING ON THE GREAT BARRIER REEF

The level of chlorophyll in the waters of the GBR lagoon is another indicator of water quality. AIMS' long-term chlorophyll monitoring program provides an indication of how water quality changes over time. This time-series monitoring of chlorophyll is also part of *Catchment to Reef* – an initiative of the Cooperative Research Centre for the Great Barrier Reef World Heritage Area (CRC Reef) and the Cooperative Research Centre for Tropical Rainforest Ecology and Management (Rainforest CRC) designed to minimise the downstream effects of landuse and improve the ecosystem health of the GBR lagoon and its feeder catchments. As part of this initiative, AIMS is testing how well satellite imagery of ocean colour provides real-time estimates of the water quality around reefs and coastal areas. A website interface showing chlorophyll production in geographic areas of the GBR has been developed for use by reef managers and policy developers.

USING STRESS INDICATORS TO MEASURE THE IMPACTS OF TERRESTRIAL RUNOFF ON INSHORE REEFS

Studies have shown that corals of inshore reefs are greatly affected by even small amounts of sediment and associated pollutants. Researchers from the Coastal Processes Group have developed indicators of stress that allow these impacts to be measured. The agricultural herbicide diuron, often present in sediment carried into the GBR lagoon, has been shown to affect juvenile corals, while other chemicals, including the less toxic mineral and bio-oils, have been shown to negatively affect adult corals and their reproduction. Fish communities have also been studied and researchers have developed techniques to measure exposure to poly-aromatic hydrocarbons at the laboratory scale. These techniques will now be used for field application. Results of research into the effects of the use of diuron have been used by DEH in its review

of the herbicide. They were also of used in the Institute's substantial contribution to the "Catchment to Reef: Water Quality Issues in the Great Barrier Reef Region" workshop initiated by GBRMPA. These contributions have allowed landholders to make better-informed operational decisions, are helping to build community confidence that Australia's resources are being well-managed, and support Australia's reputation as 'clean green' producer.

WATER QUALITY IN DARWIN HARBOUR

Seasonal monitoring of water-column characteristics and nutrient concentrations continued within Darwin Harbour. The data are used to predict what natural factors affect nutrient levels within the Harbour at various times of the year. Data from the monitoring program are made available to managers and the community through the AIMS and the Northern Territory Department of Infrastructure Planning and Environment (DIPE) websites.

Nutrient cycling processes partially determine the health and sustainable use of the harbour region. Research was undertaken to identify the role that various factors, including rates of bacterioplankton production, tides, mangroves and other intertidal vegetation, play in processing nutrients in the Harbour. Analysis of these samples is continuing. Work commenced this year on a study of polycyclic aromatic hydrocarbons (PAHs); to monitor water quality, semi-permeable membrane devices (SPMDs) will be used to measure the uptake of the PAHs. The Group, in collaboration with DIPE and Charles Darwin University, will extend this study in the coming year by deploying SPMDs at several sites affected by sewerage effluent.



DEPLOYING OCEANOGRAPHIC EQUIPMENT FROM THE RV CAPE FERGUSON

MODELLING THE HYDRODYNAMICS OF DARWIN HARBOUR

An extensive oceanographic field study was undertaken to measure the movement of water and fine sediment in Darwin Harbour. The study focused on the flushing of the harbour as well as on the mixing of water amongst the three arms of the harbour. Sediment-trapping mechanisms identified in Darwin Harbour showed minimal seaward export of sediments.

Field studies were also undertaken to investigate the movement of sediment within Fannie Bay, and the cause of severe erosion at Mindil Beach, one of Darwin's most popular beaches. The aim was to determine the mechanisms (waves, tidal currents or extreme storm events) that control the movement of sediment, and its availability for renourishment of eroded beaches in Fannie Bay. The study will also provide insight into how local coastal developments and changes to the coastline have influenced the passage of sediments within the Bay. Data collected as part of this project have shown that waves play an important role in sediment transport in the Bay, and that the strong tidal currents experienced in the region are not the primary mechanism for sediment movement.

SEDIMENTATION IN THE DALY RIVER ESTUARY

A field study in the Daly River Estuary found that rapidly accelerating tidal currents pump sediment upstream and accelerate sedimentation within the estuary. This work is contributing to an explanation of why the estuary has silted considerably between 1885 (when the area was first monitored) and 2004, and is providing a basis for the development of policies aimed at limiting further siltation and its impact. This work has contributed to the formulation of a research needs analysis for the Daly River region, being developed by the Daly River Community Reference Group.

Other outputs

- A 'causal attribution framework' to assess links between terrestrial runoff, inshore water quality, and the ecological status of coral reef ecosystems was developed. This is an adaptation of an established epidemiological methodology, based on a simple, yet rigorous, scientific process initially developed to demonstrate the link between smoking and lung cancer.
- A review of the cycling and fate of sediment and nutrients in coastal runoff identified the ability of benthic and pelagic microbes in coastal waters to absorb nutrients in this runoff. This ability helps explain the relative health of corals subject to increased sedimentation. It appears that microbes in coastal waters are highly efficient users of nutrients derived from the land – a fact that helps to explain why mid- and outer-shelf coral reefs have remained relatively unscathed, despite a significant increase in sediment delivery.

- A collaboration with researchers at the Catholic University of Louvain in Belgium pioneered the use of parallel computing to model, at small scale, the oceanography of the whole GBR region. This significant breakthrough makes possible much more efficient modelling and much-improved understanding of the processes that influence the health and sustainability of the reef.
- Presentations by scientists from the group assisted resource managers in northern Australia (notably the Fitzroy Basin Association, the Wet Tropics Natural Resource Management Board, the Johnstone Shire Council and the Douglas Shire Council) develop programs to monitor and manage water quality in their respective communities.

Outcomes for stakeholders

- AIMS researchers made a significant contribution to the development of management strategies to improve water quality in the GBRWHA. AIMS data and expertise has been used by the Queensland Environmental Protection Agency (QEPA) to develop water quality guidelines for coastal waters of Queensland, and in the development of the *Reef Water Quality Action Plan*. More recently, AIMS information has been included in the development of a program to measure the performance of the Plan.
- AIMS data and expertise were integrated into the *Darwin Harbour Regional Plan of Management* by DIPE.
- Discussions between research scientists from the Group and members of the Daly River community provided a mechanism by which local concerns about changes to the Daly River could be identified and relevant research formulated.
- A lead scientist with the Coastal Processes Group, Dr Eric Wolanski, was appointed chairman of the UNESCO ecohydrology subproject on estuaries and coastal seas, raising further Australia's science profile and its reputation for scientific excellence.



Marine Biotechnology

With primary carriage in 2003-2004 of AIMS research into tropical aquaculture, bioactive molecule discovery and bio-innovation, members of the Marine Biotechnology Group were active across seven of the Institute's nine priority research areas. These areas, and the specific research projects undertaken within them, were selected to meet the needs of all three levels of government in Australia, of industry operating at national and international levels and of other stakeholders. Importantly, they deliver against all four National Research Priorities. The research undertaken within this Group over the 2003-2006 Research Plan period will address the priorities of *Environmentally Sustainable Australia*, *Promoting and Maintaining Good Health*, *Frontier Technologies for Building and Transforming Australian Industries*, and *Safe-guarding Australia*.

AIMS Marine Biotechnology Group conducts research necessary to understand how marine reefs as well as microbial systems function at the molecular level, in order to provide insight and tools to predict how ecosystems respond to environmental change and pollution. Research also identifies new compounds for use in medicine, agriculture and industry. In addition, Group expertise is employed to investigate how traditional and non-traditional aquaculture can give rise to new industry development.

Research highlights

DOMESTICATING LOBSTER AND PRAWNS

AIMS undertook research into the production and rearing of larvae of the tropical rock lobster (*Panulirus ornatus*) in captivity. This valuable species markets at over \$30/kg, and has a larval phase that is shorter than most other rock lobster species, making it a good candidate for domestication. AIMS research has progressed well, with the successful out-of-season breeding of wild broodstock providing a year-round supply of larvae for hatchery rearing, and with progress in rearing larvae. Changes in hormone levels and corresponding hormone receptors associated with larval moulting and development have been identified. This may allow future hormonal manipulation to speed larval development and improve survival.

New work on giant tiger prawn (*Penaeus monodon*) domestication has demonstrated that handling prawns – even the act of taking blood – can cause sufficient stress to induce rapid growth of potentially lethal viruses. Information on the links between stress, infection and disease, together with effects on survivorship and reproductive potential of broodstock, was passed on to core partners in the Australian prawn industry.

AQUACULTURE OPPORTUNITIES FOR NORTHERN AUSTRALIAN INDIGENOUS COMMUNITIES

During the year, AIMS surveyed coastal marine habitats of Arnhem Land, to canvas the potential for sea sponges in waters of the Northern Territory to be cultivated in remote indigenous communities, for use as bath sponges or in industrial applications. The survey



MARINE BIOLOGIST LAYING OUT A TRANSECT LINE

field trip involved key members of the Northern Land Council and elders from Arnhem Land. Candidate bath sponge species were identified, and initial sponge growth trials have been established in collaboration with Lo Tech Aquaculture and with Sea Rangers at the communities of Warrawi and Maningrida. The project is supported with joint funding from the Indigenous Land Council (ILC), the Commonwealth Department of Agriculture, Fisheries and Forests (DAFF) and the Fisheries Research and Development Corporation (FRDC).

The year also saw further development of the sponge aquaculture project located at the Palm Islands, northeast of Townsville. Here, areas suitable for sponge farming have been identified for their cultural appropriateness, logistics, compatibility with marine park zoning plans and, importantly, their ability to support rapid growth of target species. The project has also focused on understanding the natural population dynamics of target sponge species, including distribution and abundance, and reproduction and feeding biology, in order to provide information to managers and regulators.

HERBICIDE DISCOVERY

A three-year collaborative research agreement between AIMS, JCU and Nufarm Pty Ltd was successfully completed in September 2003. The collaboration produced seventeen compounds, isolated from marine macro-organisms, that inhibit pyruvate Pi dikinase (PPDK), an enzyme found in many weeds. One of these compounds has been synthesized. Another chemical produced by a marine fungus has been identified as a PPDK inhibitor. Two compounds from the AIMS compound library were also identified as PPDK inhibitors, and another four were found to inhibit plant seed germination; all six are therefore considered to be leads for a general pre-emergent herbicide. One of the compounds entered a program in which 19 equivalent compounds were synthesised, with several retaining the ability to inhibit germination.

FIGHTING TROPICAL DISEASES

The growing diversity of diseases that are hard to treat, especially in developing countries, has been identified as a priority issue of relevance to tropical Australia. A large number of extracts from marine organisms that may contain chemicals with the potential to fight neglected world diseases (such as tuberculosis and leprosy) and overcome the increasing problem of 'superbugs' resistant to antibiotics, were identified by AIMS Bioactive Molecule Discovery team.

Screening has been carried out against the common but potentially fatal *Escherichia coli*, *Staphylococcus aureus* and *Candida albicans* bacteria. Two avenues of external funding are being pursued to enable continuation of this work for developed and developing countries, respectively. One will seek collaboration with pharmaceutical companies and seek to increase the range of antibiotics available to treat pathogens of the developed world. The second avenue will target agencies focusing on developing country needs, and will be pursued with strategically chosen partners.

TRACKING ENVIRONMENTAL TOXINS

Novel toxicological approaches have been developed at AIMS to identify the effects of pollution on the GBR. Recent studies of anti-foulant paint contamination from ship groundings on the GBR have shown that even seemingly low levels of pollution, and high levels from isolated accidents, can have significant long-term effects on marine ecosystems. In extension of this research, significant levels of tributyltin (or TBT) have been discovered in near-shore sediments at six sites in McMurdo Sound, Antarctica. The most likely source of this heavy metal toxin is anti-fouling paint abraded from the hulls of ice-breakers. Anti-foulant biocides, such as TBT, have not been considered or detected in Antarctica previously and represent a new challenge for environmental managers and custodians.



ANTARCTIC ANEMONE

PREDICTING THE CONSEQUENCES OF ENVIRONMENTAL STRESS ON CORALS

Coral disease is emerging as a major global threat to coral reef health. In collaboration with JCU, AIMS is undertaking research to understand the impact, spread and causes of coral disease on the GBR. For the first time, cyanobacterial strains associated with one of the most commonly observed coral diseases, black band disease, have been cultured and characterised. This basic research is helping to develop tools for the rapid identification of coral pathogens and to determine the means of disease transmission. Research is also focusing on the normal microbial flora of healthy corals of the GBR, and how these microbial communities change during a disease outbreak. An understanding of microbial processes that occur within coral ecosystems is required to provide essential information for effective reef management.

In collaboration with JCU, AIMS was first to apply DNA-microarray technology to compare which genes are active in naturally bleached and non-bleached coral colonies. This will provide sensitive indicators of coral reef stress for use by marine management agencies and other stakeholders. Genetic techniques were also employed for the first time to investigate the archaeal, bacterial and eukaryotic communities associated with five species of Antarctic sponge. The work provides fundamental information on how coral reefs and other marine organisms respond to stress.

COMBATING THE AGEING PROCESS

Scientists working on AIMS anti-ageing project have extended the search for UV-tolerant bacteria to tropical freshwater and terrestrial environments. Highly adapted bacteria were isolated from flora and fauna at the bottom of shallow creeks and from the leaf surfaces of sun-exposed plants. A highly tolerant marine strain of bacteria (α -proteobacterium) related to the evolutionary ancestral origin of mammalian mitochondria was selected for comparative biomedical studies. In a separate study, a non-commercial arrangement was initiated with a European pharmaceutical company to test compounds produced by marine organisms with unusual antioxidant properties for their ability to combat neurological diseases associated with ageing. Professor Kazuo Yabe from the Hokkaido Tokai University (Japan) is assisting in this work as a visiting emeritus scientist.

Other outputs

- Over 180 macro-organism extracts showing activity, and 60 micro-organisms showing anti-microbial activity against *E. coli*, *S. aureus* or *C. albicans*, were discovered.
- Two anti-tumour leads isolated from marine samples collected by AIMS are poised for preclinical trial by the United States National Institute of Cancer (NCI).
- Over 400 new extracts with potential as anti-tumour agents were isolated from marine organisms and sent to NCI for screening. These extracts had a high hit rate with many selected for more detailed investigation against NCI's '60 human tumour cell line'. Focus continues on two other significant leads, one from Western Australia and one from New South Wales.

Outcomes for stakeholders

- Findings, such as the impact of handling on the stress levels and health of prawns, and novel egg-washing techniques, are being used in the prawn farming industry to improve hatchery operating procedures.
- Following extensive consultation with AIMS, community elders and Sea Rangers from Arnhem Land are contributing to research on the potential of bath sponge aquaculture as an industry. This research is targeted at establishing commercial farming and educational opportunities that would provide a framework for employment and income generation in these remote communities.
- Australia's position on access to genetic resources and benefit sharing was established following integration of expert input from AIMS. The Australian Government delegation to the Convention on Biological Diversity policy negotiations regarding this issue used this input.
- New technologies were assigned to the AIMS-JCU spin-off company Cleveland Biosensors Pty Ltd (CBPL, formerly Toxitech Pty Ltd). These related to the development of commercial biosensors to test the quality of seafood, and to detect algal toxins in water in order to safeguard public health. Patent applications were lodged on enabling technologies for the manufacture of toxin biosensors.



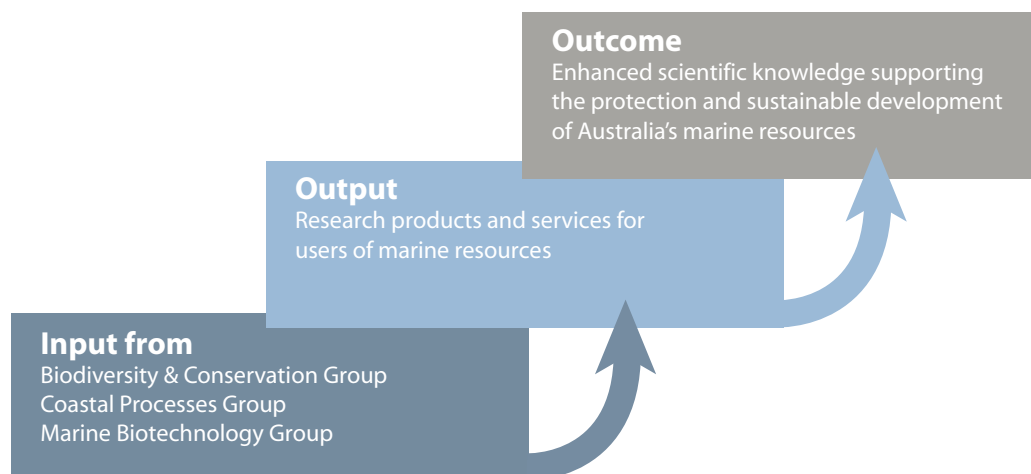
TENDING THE MICRO-ALGAL STOCK LIBRARY



Achievements against Performance Indicators

The efficiency and effectiveness of AIMS research products and services (output under the outcome-output framework) are assessed against performance indicators that have been designed to ensure the achievement of goals, and that have been agreed between the Government and the Institute (see Appendix 2). Achievements during the year against these indicators are presented below. Given the close alignment of the Institute's research with the National Research Priorities, these indicators also demonstrate the effectiveness of the Institute's contribution to those priorities.

Performance during the year demonstrates both AIMS' ongoing commitment to provide new and relevant scientific information on marine ecosystems, and its effective use of collaborative networks to build capacity and coordinate effort in order to boost knowledge creation.



Research and development

AIMS overall goal for research and development is to conduct and stimulate effective and efficient research of the highest quality (by both national and international standards) that meets the needs of industry and other users.

SHIFT OF RESOURCES TO AGREED PRIORITY AREAS

2003-2004 was the first year of operation under AIMS Research Plan 2003-2006. The research program identified in the Plan was developed in consultation with key stakeholders, and aligns with the National Research Priorities (see page 19). The Institute’s research capabilities were shifted to deliver the desired research outcomes identified in the consultation process.

The research program addresses issues of importance at both the national scale (e.g. water quality on the GBR) and the global scale (e.g. climate change), and generates information supporting the implementation of regional marine plans (e.g. Australia’s Oceans Policy). Significant research effort was also devoted to facilitating sustainable coastal development in northern Australia. Research in this area related to Darwin Harbour and to significant northern rivers (see pages 32-33), and simultaneously provided an increased research capacity from which the Institute is seeking to provide leverage for the Arafura-Timor Research Facility (ATRF) currently being constructed (see page 52).

SCIENTIFIC PUBLICATIONS

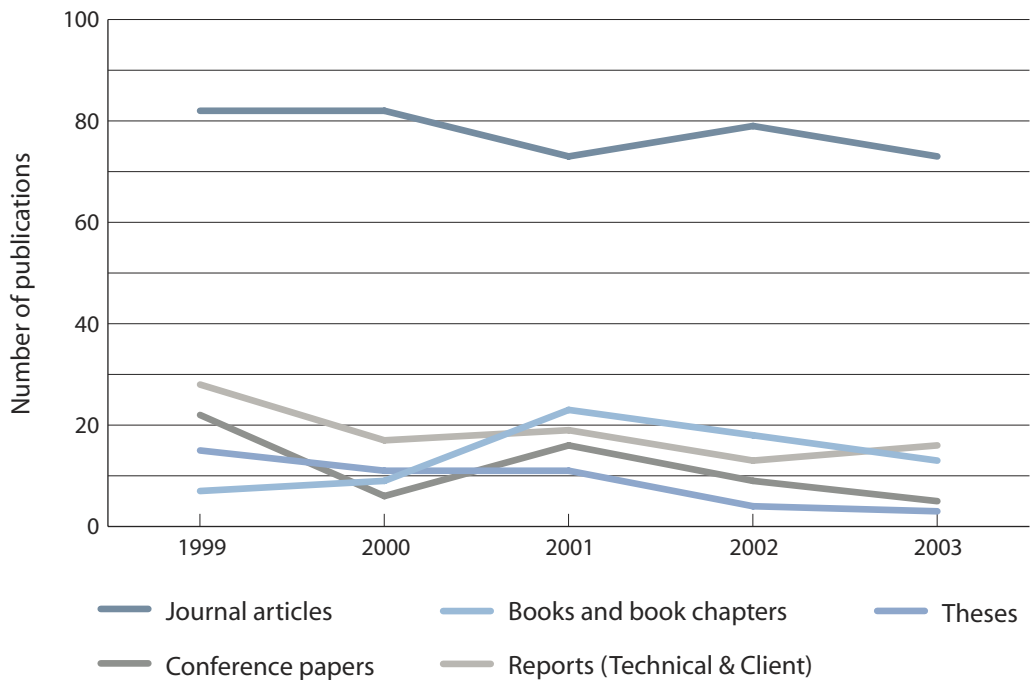
AIMS continues to expend significant effort on the creation of new knowledge and its transfer by way of publication in peer-reviewed journals. The success of this endeavour was acknowledged during the year in a report by Thomson ISI “Web of Science” (the leading source of information on scientific publications), which placed AIMS in the top 1% of specialist research organisations making an international impact.

The publication output for 2003 is summarised on the following page. While the total number of publications is down on previous years, annual variability is related to fluctuations in the scheduling of major publications and conferences. Recent effort in re-organisation, and the growing number of review submissions (policy input) have also influenced the number of publications. The number of journal articles published so far for 2004 suggests ongoing productivity. A full list of AIMS publications over the period appears as Appendix 4.

	1999	2000	2001	2002	2003	2004*
Journal articles	82	82	73	79	73	39
Books and book chapters	7	9	23	18	13	4
Theses	15	11	11	4	3	1
Conference papers	22	6	16	9	5	2
Reports (Technical & Client)	28	17	19	13	16	14
TOTAL	154	125	142	127	110	60

* number as at 30 June 2004

AIMS continued to augment its printed research output by providing an increasing variety of information on its website. Material to be found there ranges from the delivery of near real-time data (e.g. reef monitoring and weather data) to News, Media and ProjectNet pages, which again proved to be a popular reference source for journalists, teachers and students. During the year, website data delivery was expanded to include the *Reef Futures* (www.reeffutures.org), and *Darwin Harbour* (www.aims.gov.au/darwin-harbour) web pages.



The Institute's main external website (www.aims.gov.au) holds over 5000 individual pages and provides more than 8700 external links. There were 154 534 visits to the site via the main point of entry during the reporting period, continuing the upward visitation trend established in recent years.

Transference of research findings to the community through media outlets enables AIMS to raise the profile of marine science and technology, and to keep the community informed of its work. In 2003-2004, the Institute generated more than \$4.4 million worth of media coverage nationwide – a threefold increase in media representation over the previous reporting period.

Public tours are another effective means of informing the community about the activities of the Institute. During the reporting period, 64 public tours of the Cape Ferguson complex were conducted. These tours are made possible by a committed group of volunteer guides.

PATENTS

During 2003-04, AIMS managed an Intellectual Property (IP) portfolio containing 63 patents from ten families spanning a diverse range of technologies. In this period, three provisional applications were lodged. Also, three families of patents were assigned to the AIMS-JCU spin-off company, Cleveland Biosensors Pty Ltd. In accordance with AIMS' IP policy, the portfolio is managed to optimise the social, environmental and economic benefits arising from the Institute's intellectual property.

RECOGNITION BY PEERS (PRIZES, AWARDS AND ASSOCIATIONS)

During the reporting period, outstanding contributions of several individual staff members were recognised by a number of national and international professional bodies.

- Dr J. E. N. (Charlie) Veron was chosen by the International Society for Reef Studies (ISRS) to receive the 2004 Darwin Medal. The Darwin Medal, the most prestigious award given by the ISRS, is presented every four years at the International Coral Reef Symposium. It is awarded to a senior ISRS member who is recognized worldwide for major contributions throughout her/his career.
- Dr Eric Wolanski was awarded the title 'Doctor Honoris Causa' by one of Europe's oldest universities, the Catholic University of Louvain, Belgium. The award recognized Dr Wolanski's collaboration with the University over many years on issues related to marine research in the Pacific and Indian Oceans.
- Dr Wolanski was also appointed chairman of the UNESCO Ecohydrology subproject on Estuaries and Coastal Seas, and elected a Fellow of the Institution of Engineers Australia.
- Libby Evans-Illidge was invited to present a paper on AIMS' marine biodiscovery research at the Asia-Pacific Economic Cooperation (APEC) forum on Trade and Sustainable Use of Biodiversity in Jakarta; and at an International Marine Project Activities Centre (IMPAC) workshop on Customary and Conventional Laws in Biodiversity Management. Ms Evans-Illidge also participated in the international Access and Benefit Sharing Development Tool project advisory committee, and attended meetings in Montreal, Geneva and Jakarta. Ms Evans-Illidge also advised the Australian delegation to the Convention on Biological Diversity's Open Ended Ad Hoc Access and Benefit Sharing Working Group meeting, held in Montreal during December 2003.
- Dr Terry Done was invited to address the 2004 Annual Meeting of the American Association for the Advancement of Science in Seattle as a lead speaker. He delivered a paper entitled 'Local and regional threats to coral reefs: Science for solutions'.
- The FRDC Student Prize was awarded to Nick Wade at the 2003 meeting of the Australian Marine Science Association. Mr. Wade is a post-graduate student of the University of Queensland (UQ), working at AIMS.
- Postgraduate student Enrique de la Vega, who works at AIMS, was awarded the UQ special postgraduate scholarship and also accepted its travel award to attend the World Aquaculture Society Conference in Hawaii, March 2004.

In recognition of their professional standing, AIMS scientists served as editors or members of the editorial boards of 17 prestigious international scientific journals: *Coral Reefs*; *Deep Sea Research*; *Estuarine, Coastal and Shelf Science*; *Wetlands Ecology and Management*; *Oceanography*; *Fisheries Oceanography*; *Oecologia*; *Ecosystems*; *Journal of Plankton Research*; *Aquatic Conservation*; *Marine and Freshwater Ecosystems*; *Fisheries Research*; *Journal of Animal Ecology*; *Endangered Species Research*; *Continental Shelf Research*; *Journal of Coastal Research*; and *Journal of Marine Systems*.

Liaison and collaboration

Through maintenance of effective professional liaison and collaboration networks, AIMS is able to increase the capabilities of the Institute, coordinate its research, and leverage up the Commonwealth's investment in staff and infrastructure. Strong linkages with industry, government and other users (including the scientific and general communities) also facilitate the transfer of research output.

CONTRIBUTION TO AUSTRALIA'S RESEARCH FUTURE THROUGH TEACHING AND TRAINING

AIMS staff continued their strong affiliation with universities and their contribution to teaching Australia's future scientists, by training undergraduates and supervising postgraduate students.

Eleven staff had adjunct appointments at universities and several other members of staff gave guest lectures to undergraduate training courses. The universities at which AIMS staff teach include JCU, the University of Queensland (UQ), the University of Western Australia (UWA) and the University of Manitoba, Canada (Earth Sciences). The affiliation is especially strong with JCU because of the collocation in Townsville of the two bodies. Adjunct appointments at JCU extend across four schools, and collaboration between the agencies will be further strengthened in the coming year through the establishment of AIMS@JCU (see page 52).

In 2003-2004, 56 postgraduates were supervised by AIMS staff. The number of students and trainees supervised is shown below.

	2002-03	2003-04
AIMS staff enrolled in postgraduate studies	9	9
Students supervised by AIMS staff working at AIMS	21	21
Students supervised by AIMS staff working externally	28	35
Occupational trainees (Australia and overseas)	26	12

**COORDINATION OF RESEARCH AND
LINKAGES WITH DECISION-MAKING BODIES**

AIMS ensures the continuing quality and relevance of its research by maintaining ongoing links with users of its research, including other researchers. These links enable coordination of effort and effective use of resources. Coordination of research is facilitated by participation in joint research projects, collaborations among working scientists, partnerships in Cooperative Research Centres, strategic alliances, joint ventures and involvement with relevant user groups.

The Institute continued to build on its already significant research networks with the addition of a growing number of more formal, institutional collaborative arrangements. In addition to the CRC Reef, AIMS pursued value-adding alliances in order to increase its effective capacity to deliver research outcomes. Recent examples include the NOAA strategic alliance, efforts to coordinate research in the north by way of the Arafura-Timor Sea Experts Forum, the ATRF and AIMS@JCU. These collaborative arrangements can also open new opportunities for Australian research. A recent example is ongoing discussions with the Center for the Advancement of Genomics and the Scripps Institution of Oceanography regarding marine microbial biodiversity that are opening opportunities for new research in marine genomics.

COLLABORATIONS

AIMS maintains a high commitment to collaboration, and has an extensive collaborative network, with links to over 140 research institutions and industry partners. The network extends across all States and Territories nationally, and to 29 countries (see map). The effectiveness of this collaborative effort is reflected in the high number of peer-reviewed publications that were co-authored with researchers from other institutions. In 2003, 77% of AIMS journal publications fell into this category. The strong relationship between AIMS and overseas institutions is demonstrated by the fact that 33% of these were co-authored with researchers from international science and technology organisations.

During the reporting period, AIMS continued to provide a major role in the Global Coral Reef Monitoring Network (GCRMN) which facilitates strong working relationships with researchers and resource managers involved with coral reefs in over 80 countries.

Dr Eric Wolanski was recognised during the year for his long-term collaboration with the Catholic University of Louvain, Belgium, on issues related to marine research in the Pacific and Indian Ocean (see Recognition by Peers, page 44).

Some of the most significant collaborative projects during 2003-2004 were:

- The three-year, \$5m *Catchment to Reef* project – a cooperative program with JCU, Griffith University, the UQ and CSIRO Land and Water. AIMS is leading two of the seven projects within this program – ‘Advanced Technologies for Monitoring Water Quality’ and ‘New Tools to Assess the Health of Inshore Ecosystems’ – which will see the development of new tools to assess and monitor the health of catchments and aquatic systems in both the WTWHA and GBRWHA. The tools will also enable land managers to mitigate the effects of human activities on water quality. This research will help to improve the health of river catchments and the GBR.
- The Seabed Biodiversity project. This project involves scientists from AIMS, CSIRO Marine Research, CSIRO Mathematical and Information Sciences, QDPIF, Queensland Museum, and the Museum of Tropical Queensland. Financial support of almost \$2m is provided by CRC Reef, FRDC and the National Oceans Office. In addition, research providers contribute another \$4m of resources (e.g. staff, vessels, equipment).
- Collaborative research with NCI to identify new anti-tumour compounds in marine organisms. This project provides access to the NCI anti-tumour screening facility in Washington and increases the likelihood of progressing development of anti-tumour candidates, thereby increasing the flow of benefits back to Australia. As part of this collaborative effort, two significant leads from past preliminary screening efforts in Australia have been re-examined prior to being considered for re-entry into preclinical trials.



LOCATION OF COLLABORATING ORGANISATIONS

- AIMS, GBRMPA, NOAA and the UQ are undertaking joint research into coral bleaching and climate change. The combination of the complementary skills and infrastructure of these organisations heightens the potential to deliver significant research outcomes.
- The multi-institutional project to tag and track the short- and long-term movement patterns of whale sharks at Ningaloo Reef, northwest Western Australia, involves the Western Australian Department of Conservation and Land Management (CALM); the New England Aquarium (US); NOAA; and Huggs SeaWorld (US).
- The prawn domestication project, funded by FRDC, has been set up to understand and remove the barriers to giant tiger prawn *Penaeus monodon* domestication, and involves the collaboration of AIMS, CSIRO, QDPIF, Seafarm Pty Ltd, Gold Coast Marine Aquaculture Pty Ltd, Rocky Point Prawn Farm and the Australian Prawn Farmers Association.

POLICY INPUT

The Institute continues to provide input to state, national and international fora across a range of issues. The forms of the input vary but include direct consultation, membership on relevant committees (see page 99), input to the development of discussion papers, and submissions to reviews. All are targeted at providing expert advice for the development of effective policy.

Submissions to reviews were, again, a major element of the Institute's contribution during the reporting period. The Institute was, for example, an active participant in the *Review of Closer Collaboration between Universities and Major Publicly Funded Research Agencies* (the Research Collaboration Review) and the *Taskforce on Research Infrastructure*.

Other specific contributions to the policy-making process included:

- A submission and several subsequent informal contributions to the Queensland Government in relation to the drafting of its biodiversity legislation. The Queensland *Biodiscovery Bill 2004*, which incorporated many of AIMS' representations, was tabled in May 2004.
- Extensive input into the Commonwealth-Queensland governments' *Reef Water Quality Protection Plan* that was released in October 2003. GBRMPA is responsible for implementing, managing and reporting on a comprehensive coastal and marine monitoring strategy designed to document environmental improvement resulting from actions carried out under the Plan. As part of this process, AIMS provided comment to GBRMPA on a draft outline of a proposed monitoring program that will help document the status of water quality and of key biological communities in the GBR region over the next ten years.
- Input into the development of national coastal policy by way of expert comment on the implementation plan for the *Framework for the National Cooperative Approach to Integrated Coastal Zone Management*.

- Ongoing advice to government regarding global climate change. This included reviewing drafts of the *National Biodiversity and Climate Change Action Plan* for DEH, and production of a report for the State of Queensland Greenhouse Taskforce on the implications of different sea temperatures for coral reefs in the GBR region.
- Expert advice regarding working models for access to biodiversity and benefit sharing with resource owners. AIMS expertise has been sought in many international fora and, during the reporting period, AIMS provided expert advice to the Australian Government delegation presenting the Australian position at a meeting of the Convention on Biological Diversity's Access and Benefit Sharing Open Ended Ad Hoc Working Group (Montreal, December 2004).
- Submission of a report, *Guidelines for Managing Risks in Recreational Water*, to the National Health and Medical Research Council.
- Expert comment on marine park management plans, including GBRMPA's *Draft Zoning Plan for the Great Barrier Reef Marine Park*; *Draft Zoning Plans for Ningaloo Marine Park*; *The Management Plan for Ningaloo Marine Park*; and *The Management Plan for Rowley Shoals Marine Park*.
- Submission to the Northern Territory Government Draft Bioprospecting Policy Review and follow-up meetings with Department of Business, Industry and Resource Development.
- Input to the research needs of Darwin Harbour through membership of the Darwin Harbour Advisory Committee. The *Darwin Harbour Regional Plan of Management* was submitted to the Northern Territory Minister for Lands and Planning on 11 November 2003. It was tabled at the November sitting of the Northern Territory Legislative Assembly for comment, and formally adopted in April 2004.

Uptake of the Institute's expert advice is evident in many of the outcomes from these various fora/reviews. Of particular note during the reporting period were two outcomes relating to management of the GBRWHA to which AIMS made significant contribution. The first was the *Reef Water Quality Protection Plan* that will be central to the management of water quality improvement in the GBR region over the next ten years. The second was the rezoning of the GBRMP that resulted in the area of 'no-take' zones as a proportion of the Park being increased from 4% to 32%.

Technology transfer and commercialisation

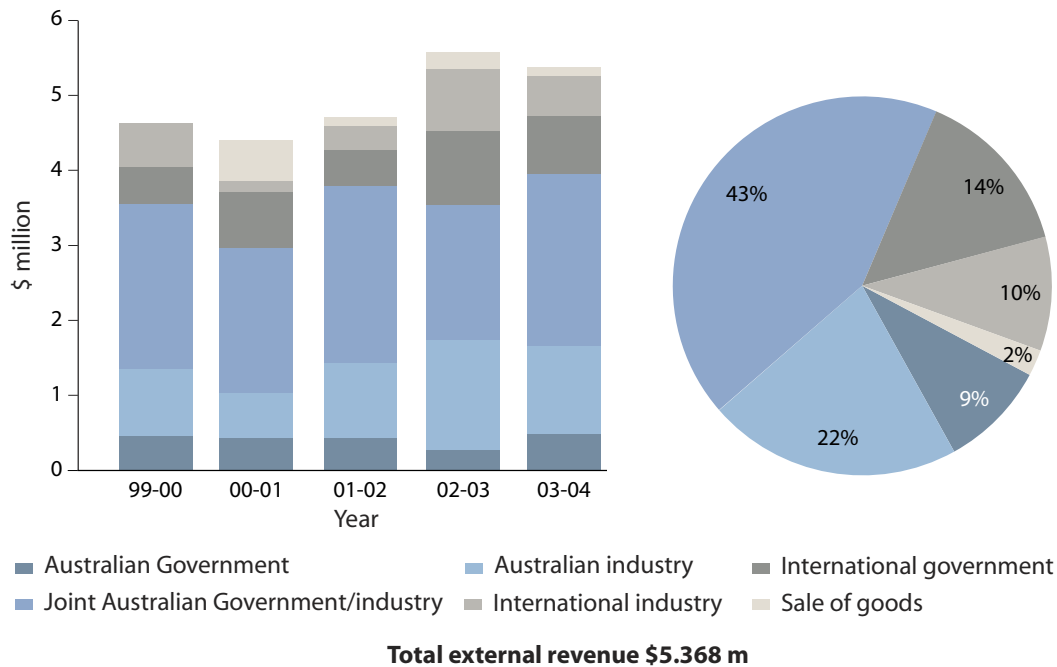
AIMS is committed to transferring knowledge and technology to users of marine research and to capturing benefits from this transfer. These benefits include not only the longer-term benefits that accrue from sustainable use and protection of our marine resources, but also those associated with expanding the scope of the research by re-investing external income, and with the protection and further development of potentially commercial technology.

EXTERNAL EARNINGS FOR RESEARCH SERVICES

During the reporting period, the Institute achieved external earnings of \$5.368 m, a slight decrease on the previous year. The proportion of external earnings derived from Australian Government and joint Australian Government-industry partnership sources increased significantly during the year. Funding from CRC Reef was substantially up on the 2002-03 financial year.

Ongoing efforts to link with industry continued to produce significant earnings for the Institute. Seventy five per cent of external earnings were sourced from industry or industry-government partnerships, mostly at the national level. Twenty four per cent of external earnings came from overseas.

The Institute achieved an external earnings ratio of 20%. The ratio is defined in AIMS' Triennium Funding Agreement, and includes adjustments to revenue for items unrelated to



the provision of research and technology services (for example, interest on investments). Following a review by the Chief Scientist, Dr Robin Batterham, the government removed the Institute's external earnings target ratio of 20% in September 2002.

ADOPTION BY USERS OF PRACTICES, INSTRUMENTS AND PROCESSES

The Institute places high priority on the transfer of its outputs to end users. The application of knowledge and technologies by other users and agencies demonstrates the relevance and leadership AIMS is providing in marine science. Some examples demonstrating effectiveness include:

- Protocols developed by AIMS for monitoring the condition of the GBR have been adopted nationally and internationally. Monitoring methods for coral reefs have been transferred directly through the GCRMN, which is applying the procedures adopted by the United Nations Environment Program (UNEP) as the global standard. The procedures are made freely available on the Institute's website and, consequently, definitive data on application is not available. A recent example of the application of AIMS' methods is in the Mesoamerican Barrier Reef Systems Project, a project of the World Bank/Global Environment Fund based in Belize.
- Output from AIMS automatic weather stations is made available on the AIMS website (www.aims.gov.au/pages/facilities/weather-stations/weather-index.html), providing near real-time, half-hourly observations of air and sea temperature, wind speed and direction, air pressure and light levels. This information is accessed directly by recreational users of the reef, reported in local TV weather broadcasts and is used by the local Bureau of Meteorology. Use of data by researchers continues to increase and is being applied to wide-ranging studies (e.g. of coral bleaching, turtles, and wind generation).
- Scientific knowledge about water quality in the GBRWHA has assisted in the development of management strategies for the region. Queensland Environmental Protection Agency has used the information to develop water quality guidelines for GBR reef and coastal waters as part of the Australian and New Zealand Environment and Conservation Council (ANZECC) procedure.
- Improved prawn hatchery methods, developed as part of the Institute's research program, have been picked up and applied by industry. One AIMS study, focused on the control of viruses during egg production in prawn hatcheries, included testing a variety of egg-washing techniques. Results indicated that one of the chemicals tested improved hatch rates. This method is now being used in several commercial hatcheries.
- Methods developed by AIMS to investigate historical records of growth in corals through measurement of coral density have been adopted by several other research groups during the year. Researchers from Darwin and Mexico have used AIMS instruments to detect environmental change in Darwin Harbour and the Caribbean.
- Low-technology methods for growing sponges, developed by researchers at AIMS in order to investigate factors affecting sponge growth and survival, are being adapted to suit local species and conditions and used in projects exploring the potential for new bath/industrial sponge aquaculture industries in remote indigenous communities.

- During the reporting period AIMS transferred three patent families to Australian industry (see Patents, page 44)

JOINT VENTURES AND STRATEGIC ALLIANCES

AIMS' efforts to significantly increase research capacity through the development of strategic alliances were significantly advanced during the reporting period.

- AIMS and the Australian National University (ANU) entered into an unincorporated joint venture known as the Arafura-Timor Research Facility (ATRF). Construction of the facility, due for completion later this year, is underway. During the year a Chief Executive Officer was appointed to promote the facility as a research hub and to build business and collaborative opportunities.
- AIMS and James Cook University, with assistance from the Australian Government, have developed an unincorporated joint venture, AIMS@JCU. The venture will facilitate collaboration between the Institute and the University, and will increase Townsville's profile as Australia's centre of excellence in tropical marine research and education. The unincorporated joint venture was signed in June 2004. The venture will be oversighted by a board comprising an independent Chairperson and representatives of both organisations.
- AIMS' strategic alliance with the US National Oceanic and Atmospheric Administration (NOAA) was strengthened with the development of a series of collaborative proposals that add value to the research efforts of both organisations. This alliance is being developed under a broader agreement that includes GBRMPA and the UQ.
- AIMS is a partner in the Australian Oceanographic Data Centre – Joint Venture. This is a consortium of Australian Government marine agencies set up to increase the level of integration between agencies, to develop data standards and exchange mechanisms, and to act as a focal point for marine data activities.

SPIN-OFF BUSINESS

During the reporting period, the AIMS-JCU spin-off company Cleveland Biosensors Pty Ltd (CBPL) (formerly Toxitech Pty Ltd) continued to develop its product portfolio. To support the Company's product development and investment-raising efforts, AIMS and JCU assigned to it three patent families. AIMS' and CBPL's other development partners continued to provide research services to the company in order to develop its products.

The Institute's other spin-off companies, WetPC Pty Ltd and Sunscreen Technologies Pty Ltd, continued to operate and pursued product development in their respective technological fields.

Customer satisfaction

AIMS recognises the importance of its stakeholders, including all users of the Institute's research. Consequently, it puts a high priority on transfer of research output and findings to users, and on customer satisfaction. Since the development of the Research Plan, ongoing liaison with major stakeholders has continued to be constructive. Additionally, AIMS researchers are repeatedly asked to provide expert advice on matters relating to marine ecosystems.

Very positive feedback on the utility of data provided on the AIMS website for day-to-day use by managers was received. During the year, AIMS maintained its effort to provide useful information via the web. Community feedback regarding AIMS' tours – determined by exit surveys – indicated 99% satisfaction.

CONTRACTS SUCCESSFULLY COMPLETED

AIMS provided over 100 reports to external contract clients during the reporting period. These were provided in a timely manner. The quality and usefulness of the contracts is reflected in the high percentage of contracts entered into with previously existing clients (88%) – a measure of customer satisfaction. Twenty-four new contracts were signed during the year.



RV CAPE FERGUSON DEPARTS DAVIES REEF

Corporate Overview

Location of Major Facilities and Activities
Role, Legislation and Minister
Staffing and Structure
Corporate Governance
Public Accountability

Corporate Overview



LOCATION OF MAJOR ACTIVITIES AND FACILITIES (ABOVE) AND INTERNATIONAL ACTIVITIES (BELOW) DURING THE REPORTING PERIOD.





Role, Legislation and Minister

The role of AIMS is to carry out research and development in relation to marine science and technology, and to encourage and facilitate the application and use of the results of these activities.

The Institute is a Commonwealth statutory authority established by the *Australian Institute of Marine Science Act 1972*. Amendments made to the Act in 2002 strengthened the Institute's ability to commercialise its research. The functions and powers of AIMS are set out in Sections 9 and 10 of the Act (see Appendix 1 of this report).

The Minister with responsibility for AIMS during the reporting period was the Hon. Peter McGauran MP, Minister for Science.

LOCATION OF MAJOR FACILITIES AND ACTIVITIES

The Institute's main facility is at Cape Ferguson, 50 kilometres from Townsville in North Queensland. From this location AIMS has ready access to the research opportunities offered by the Great Barrier Reef. Two small bases, in Darwin and Fremantle, support research in the northwest and west of Australia, and provide direct linkages with stakeholders in these regions.

In Australia's Ocean Territory most of AIMS' fieldwork is conducted from its two research vessels, the *RV Lady Basten* and the *RV Cape Ferguson*. During 2003-2004, these vessels supported 45 research expeditions averaging 263 days at sea. The *RV Lady Basten's* operations were restricted to east coast operations due to servicing requirements.



**CONTINUOUS MICRO-ALGAL PRODUCTION SYSTEM IN THE AIMS
TROPICAL AQUACULTURE FACILITY**



Staffing and Structure

The total number of staff employed by the Institute during 2003-2004 was 157.7 (full-time equivalent value). All members of staff are employed under the *Australian Institute of Marine Science Act 1972* (amended 2002). In addition to those paid from Australian Government appropriation, the Institute periodically employs staff to work on projects funded from external sources.

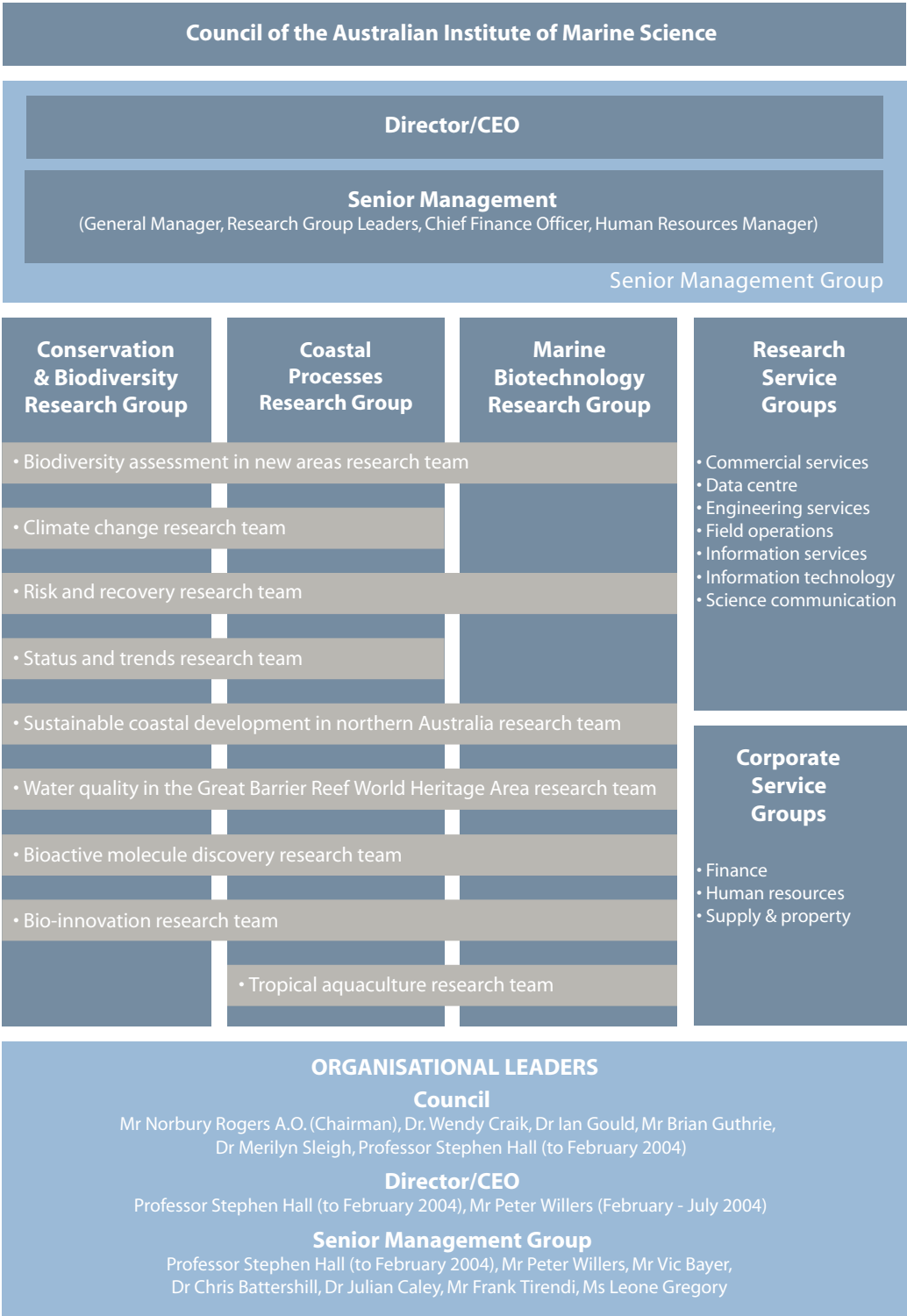
The following tables provide a breakdown of staff numbers and EEO status.

	Female	Male	Total
Science groups	31.2	73.8	105.0
Research services	5.7	24.9	30.6
Corporate services	11.1	11.0	22.1
Total staff	48.0	109.7	157.7

Aboriginal and Torres Strait Islander	0.63%
Non English-speaking background	7.55%
Staff with a disability	6.29%
Women	32.1%

The work of the research staff is supported by a variety of professional research support staff skilled in data management, commercial services, IP portfolio management, engineering services, field operations, information technology, information services and science communication. Corporate Service Groups deliver financial, human resource, supply and property, and general management services to all AIMS staff.

The Senior Management Group is made up of the Director/CEO, the General Manager, the leaders of the three Research Groups, the Chief Finance Officer and the Human Resources Manager.





Corporate Governance

AIMS has in place a comprehensive system of corporate governance practices designed to provide control, disclosure and accountability for the Institute's activities. These practices derive principally from the provisions of the *Australian Institute of Marine Science Act 1972* (AIMS Act) and the *Commonwealth Authorities and Companies Act 1997* (CAC Act).

THE MINISTER

The Institute meets its responsibilities to the Australian Government through the Minister for Science, the Hon. Peter McGauran MP, and the Department of Science, Education and Training.

THE COUNCIL

Under the AIMS Act, the Council (or Board) of the Institute comprises a part-time Chairperson, a full-time Director/CEO and four other part-time members. Council members are appointed by the Governor-General, and at least three members must possess scientific qualifications. Appointments can be for up to five years and reappointment is permissible. The Director/CEO can hold office for a period not exceeding seven years, and is appointed on the recommendation of the Council. The members of Council (see details below) bring complementary skills and experience to governance of the Institute. The Remuneration Tribunal determines the level of remuneration and allowances paid to part-time Board members.

ROLE OF THE COUNCIL

Council sets the Institute's key objectives and research strategies via a three-year research plan. The plan takes into consideration the National Research Priorities and stakeholders' priorities. Progress against the plan is reported to the Council, on a continuous basis, by the Institute. The Minister is also provided with ad hoc advice on developments of significance, as appropriate.

The CAC Act requires the Council to comply with certain accountability and corporate governance principles, including:

- the maintenance of the Audit Committee;
- specific financial and reporting provisions;
- disclosure of Board Members' personal interests; and,
- provision of indemnities and indemnity insurance in certain circumstances.

During 2003-2004, all CAC Act requirements were met.

COUNCIL MEMBERS

Mr Norbury Rogers AO (Chairman) BCom. AAUQ, FCA, FAICD

Non-executive member (Term 30/07/98 to 31/12/04)

Mr Norbury Rogers AO is a Chartered Accountant and Company Director, and is a Senior Consultant to Ernst and Young, having previously held the positions of Managing Partner and Senior Partner with that company (and its predecessors). Mr Rogers is Chairman of Golden Casket Lottery Corporation Limited and of UniQuest Pty Limited, and is the Deputy Chairman of the Board of Business Management Limited. He is an Independent/Non-Executive Director of Magellan Petroleum Australia Ltd, Chairman of the Compliance Committee for Suncorp Metway Investment Management Limited, and an External Member of the Risk Management and Audit Committee for the Australian Prudential Regulation Authority (APRA). He has been a long-standing, active member and office bearer of the Institute of Chartered Accountants in Australia and is also a member of the Senate of The University of Queensland and of many associated committees.

Dr Marilyn Sleigh BSc(Hons), PhD, Dip Corp M'tment, FTSE, FAICD

Non-executive member (Term 30/7/98 to 30/6/05)

Dr Marilyn Sleigh is the Chief Executive Officer of biotechnology company EvoGenix Pty Limited. Since joining EvoGenix shortly after its establishment in August 2001, Dr Sleigh has been engaged in business and strategic planning, marketing and fundraising for the company, and in directing the establishment of its technology platform, which focuses on the development of biopharmaceuticals. Currently, Dr Sleigh is a member of the Board of Australian Biotechnology and Healthcare Fund No 3, a Board Member of the Australian Business Foundation, and a Committee Member of the Cooperative Research Centres Committee. She is also a member of the NSW Innovation Council.

Dr Ian Gould BSc (Hons), PhD (Geology), FAusIMM

Non-executive member (Term 8/8/02 to 7/8/07)

Dr Ian Gould brings to AIMS high-level business, research and policy expertise, as well as familiarity with environmental issues. He has over 36 years experience in the minerals industry and is currently Chairman of the AJ Parker Cooperative Research Centre for Hydrometallurgy, the Australian Centre for Mining Environmental Research, the Australian Biological Resources Study Advisory Committee, and St Andrew's Hospital Board; President of the Australasian Institute of Mining and Metallurgy; Vice President of the Royal Flying

Doctor Service (Central Operations); and a Member of South Australia's National Parks and Wildlife Council, and of the CSIRO Minerals and Energy Advisory Committee.

Dr Wendy Craik BSc (Hons), PhD, Grad Dip M'ment, FTSE, FAICD

Non-executive member (Term 1/7/97 to 30/6/04)

Dr Wendy Craik brought to AIMS experience in public policy, environmental planning, executive management and research. She is Chair of the Australian Fisheries Management Authority and a part-time Associate Consultant to ACIL Tasman. A fisheries biologist, she worked at the Great Barrier Reef Marine Park Authority for the 17 years to 1995, the last three as the Executive Officer. Currently, she is a councillor on the National Competition Council, Chairperson of the National Rural Advisory Council, a Board Member of the Foundation for Rural and Regional Renewal, Director of Ennever Rainworth Pty Ltd, a Board Member of Minter Ellison National Government Advisory Board and a Member of the Drought Review Panel.

Mr Brian Guthrie BEng, BEcon, MEng

Non-executive member (Term 30/7/98 to 30/6/04)

Mr Brian Guthrie has enjoyed many years of experience in executive management in both the public and private sectors. He started his career as an assistant engineer at the Townsville City Council (TCC), gaining experience in all facets of local government engineering. He was Works Engineer for TCC for ten years prior to moving to private enterprise with a major subsidiary of Brambles Pty Ltd, where he held the position of National Manager for Government Services. He returned to the public sector as General Manager of the Townsville/Thuringowa Water Supply Board, a position he held until he was appointed Deputy Town Clerk and Director, Corporate Services with the TCC. For the past ten years Mr Guthrie has been TCC's Chief Executive Officer. He is also a Board member of the telecommunications company Townsville Regional Telco Ltd.

Professor Stephen Hall BSc, PhD, GAICD

Executive member (Term 14/11/00 to 13/2/04)

Professor Hall was appointed Director of AIMS in 2000. He has published extensively on the structure and functioning of marine ecological systems, focusing on the effects of natural and human disturbance, and recently authored a book on the global effects of fishing on marine communities and ecosystems. Professor Hall is a member of the US National Research Council Panel on the Effects of Trawling, and is a recipient of a Pew Fellowship in Marine Conservation. In February 2004, Professor Hall took up the position of Director General of the WorldFish Center in Malaysia.

Dr Ian Poiner BSc (Hons), PhD

Executive member (Term 12/7/04 to 11/7/09)

Dr Ian Poiner commenced as the Director on 12 July 2004. He has significant experience in strategic development and planning of science both as a practising scientist and at the organisation level. This is reflected in successful large-scale, multi-disciplinary research projects and the establishment of national and international research programs to support

the sustainable use, conservation and management of marine ecosystems. Dr Poiner's scientific background is in research into tropical fisheries and ecological systems including Australia's northern Great Barrier Reef, Torres Strait and the Gulf of Carpentaria. He has also worked abroad in Jamaica, Papua New Guinea and Southeast Asia.

COUNCIL ATTENDANCE

	8-9 Sept 03 Townsville	10-11 Nov 03 Townsville	9 March 04 Townsville	19 April 04 Brisbane	21-22 June 04 Townsville
Mr Norbury Rogers AO	✓	✓	✓	✓	✓
Dr Ian Gould	✓	✓	✓	✓	✓
Dr Marilyn Sleigh	✓	✓	✓	✓	✓
Dr Wendy Craik	✓	✓	✓	✓	✓
Mr Brian Guthrie	✓	✓	✓	✓	✓
Prof. Stephen Hall	✓	✓	—	—	—
Mr Peter Willers (Acting Director)	—	—	✓	✓	✓

AUDIT COMMITTEE

The Audit Committee is a formal sub-committee of the Council established to assist Council in the discharge of its responsibilities. The Committee focuses on areas of financial reporting, internal controls and risk management and comprises members outside the Institute's management structure. The Committee has unlimited access to both the internal and external auditors and to senior management.

The Committee meets at least three times a year. As at 30 June 2004, the Audit Committee comprised Mr Brian Guthrie (Chairman and Council member), Mr Norbury Rogers AO (Council member), and Mr Robert Tardiani (independent member). Dr Ian Gould (Council member) attended the last meeting of the Committee to provide continuity for the retirement of Mr Brian Guthrie, whose term on Council expired in June 2004. The Institute's Chief Finance Officer, Mr Vic Bayer, provides secretarial support to the Audit Committee. At the invitation of the Committee, Mr Peter Willers (AIMS General Manager), Mr John Zabala (Pickard Associates) and a representative of Australian National Audit Office may also attend meetings to provide information for the Committee.

The Audit Committee reviews:

- annual financial statements before their consideration and adoption by the Council;
- the clarity and quality of the Institute's financial policies, practices and disclosure;
- internal and external auditors' plans, reports and performance;
- significant existing and emerging risk and mitigation activities;
- the adequacy and effectiveness of internal controls;
- compliance with laws and regulations; and,
- related party transactions.

During the year the Audit Committee:

- reviewed the annual operating and capital budgets;
- reviewed monthly and annual financial statements;
- reviewed the Institute's asset management manual; and
- commenced a review of the Institute's Corporate Governance Manual and the Fraud Control Plan.

AUDIT COMMITTEE ATTENDANCE

	27 August 03	26 February 04	10 June 04
Mr Brian Guthrie	✓	✓	✓
Mr Norbury Rogers	✓	✓	✓
Mr Robert Tardiani	✓	✓	✓
Dr Ian Gould	—	—	✓

FRAUD CONTROL

Annual fraud data were collected and reported in compliance with the Commonwealth Fraud Control Guidelines. There were no incidents of fraud reported during the year. The Institute is in the process of reviewing its Fraud Control Plan and will be conducting fraud risk assessments in accordance with the Commonwealth Fraud Control Guidelines.

RISK MANAGEMENT FRAMEWORK

During the year, the Council approved the implementation of a risk management framework. The Audit Committee was given the responsibility of overseeing the implementation of the integrated risk management framework, which takes into consideration both strategic/commercial risk and operational and compliance risks.

INDEPENDENT PROFESSIONAL ADVICE

Council has the right to obtain, at the Institute's expense, relevant independent professional advice in connection with the discharge of their responsibilities. The Council sought assistance with a review of the roles and responsibilities of the Council, the Chairman and Directors, and on performance review, during the reporting period.

DISCLOSURE OF INTEREST

Section 27 of the CAC Act provides for the disclosure of material personal interests in a matter that is being considered by the Council, and prohibits participation, deliberation and decision-making by any member on such matters, unless so resolved by the Council or entitled by the Minister. Details of such disclosure are recorded in the minutes of the meeting. During the reporting year, all of these requirements were met.

INTERNAL AUDIT

To help the Institute meet its obligations, AIMS maintains an independent internal audit service that applies a systematic, disciplined approach to evaluating and improving control and governance processes.

The Council-approved internal audit process involves a comprehensive program of internal auditing within the Institute, with full and unrestricted access to all functions, property, personnel records, accounts, files and other documentation.

The internal audit program is subject to approval by the Audit Committee, and the results, progress and performance of internal audit are presented quarterly to the Management Group, the Audit Committee and external auditors.

Pickard Associates performs the internal audit function for the Institute. The firm was appointed in 2003 for a period of four years.

EXTERNAL AUDIT

Under the CAC Act the Auditor General is the external auditor for the Institute. The Australian National Audit Office has contracted the audit work to Ernst & Young. The Audit Committee reviews the Australian National Audit Office audit plan and meets with the external auditor prior to recommending financial statements be signed by the Council.

INDEMNITIES AND INSURANCE PREMIUMS FOR OFFICERS

AIMS paid premiums for the Directors and officers insurances as required under the CAC Act. During the reporting period, no premium was paid (nor agreed to be paid) against a current or former officer's liability for legal costs. There were no known liabilities to any current or former officers.

STAFF CONSULTATION

Staff consultation occurred through a range of fora. The Joint Consultative Committee met six times in 2003-2004. This committee provides a forum for discussion and consultation between management and staff representatives.

CONSULTANCY ADVICE

In order to carry out its duties, the Institute occasionally seeks independent professional advice from consultants and subcontractors. During 2003-2004, the Institute consulted with:

- Northern Project Management, which undertook a review of the Institute's Engineering Services
- Pickard Associates (see Internal Audit).

SUBCONTRACTORS

Subcontractors are selected on the basis of quality, value for money, and availability. Tenders are required for services or products with a value greater than \$60 000. The Tender Board must approve exemptions from public tendering in writing. Consistent with Section 21 of the CAC Act, Council members and staff cannot be involved in decision-making about subcontractors connected to them or to an immediate family member.



Public Accountability

MINISTERIAL DIRECTIONS AND APPROVALS

There were no Ministerial Directions during the reporting period.

JUDICIAL DECISIONS AND REVIEWS BY OUTSIDE BODIES

No judicial decisions related to AIMS and no reviews of AIMS by outside bodies occurred during the reporting period.

OMBUDSMAN

No issues relating to AIMS were referred to the Commonwealth Ombudsman.

INVESTING AND FINANCING ACTIVITIES

The Institute's participation in joint ventures and strategic alliances is described on page 52. The Institute did not form any companies or commence or cease any other business activities during the reporting period.

During the year the Council resolved to sell its shareholding in AMRAD Corporation Ltd, which had been acquired in October 2002 as part of a collaborative research program. The sale of the entire shareholding was completed in October 2003.

The Institute retains an investment in spin-off company Cleveland Biosensors Pty Ltd. The company was formerly known as ToxiTech Pty Ltd. The Institute's shareholding has been diluted from 50% to 12.5 %, with capital funding being provided by new investors.

OCCUPATIONAL HEALTH AND SAFETY

The Institute launched its Safety Induction Series for those new to the AIMS workplaces. The series uses video, delivered on DVD, combined with on-line manuals and questionnaires. Staff at the Institute contributed generously with their time and expertise to this project, resulting in a greater awareness of their duty-of-care to co-workers and visitors. It is expected that this collaborative approach will continue in the future development of the Safety Induction Series.

Comcare conducted a 'desktop audit' of AIMS' response to the Scheduled Investigation into our OH&S Management Systems. The audit result was positive and the Institute continues to bring its OH&S Management Systems into line with the SafetyMAP audit tool.

Progress was made on negotiating a new five-year OH&S Agreement between AIMS and its staff representatives. The agreement will outline how AIMS and its staff will cooperate to deliver best practice OH&S at the Institute. It is expected that the agreement will take effect early in the new financial year.

A total of 32 incidents were reported during the year, with three of these resulting in time lost from the workplace. The number of incidents reported by staff is trending upwards because of a growing and positive focus on near-misses, but the severity of these incidents is generally less than in previous years.

Two compensation claims were accepted by Comcare during the reporting period.

There were no formal reactive investigations conducted by Comcare under Section 29 of the *Occupational Health and Safety (Commonwealth Employment) Act 1991* (OH&S Act). No Provisional Improvement Notices were issued by the Health and Safety Representatives, nor were any notices issued by Comcare under Section 45, 46 or 47 of the OH&S Act.

OCCUPATIONAL HEALTH AND SAFETY TRAINING

During the year, 255 Institute Safety Inductions were completed for staff, contractors and visitors. OH&S training in First Aid, CPR/Oxygen Resuscitation, Dive Rescue, Diver Supervision, Radiation Safety and Fire Safety was delivered to 184 course attendees.

RADIATION SAFETY

The Institute continues to hold a Source Licence from the Australian Radiation Protection and Nuclear Safety Agency. The X-ray facility aboard the *RV Cape Ferguson* was refined to deliver consistent results.

GENE TECHNOLOGY

At the annual Institute Biosafety Committee meeting, required by the Office of the Gene Technology Regulator (OGTR), relevant proposed research projects were assessed. All bar

one were deemed to be 'Exempt'; the exception was categorised 'Notifiable', with assessment to be undertaken by the OGTR.

ENVIRONMENT

The Department of the Environment and Heritage continues to advise the Institute on the implementation of its Environment Management Plan (EMP) and the development of its Environment Management System. The Environment Committee, made up of both research and research services staff, is overseeing the implementation of the EMP. The Committee was given the task of developing the Institute's Environmental Policy which, recently approved, will minimise the environmental impact of AIMS' research activities.

The Institute uses a number of substances declared under the National Pollution Inventory of the *National Environment Protection Measures (Implementation) Act 1998*, in quantities below the current declared threshold levels; in 2003-2004 it met the reporting requirements.

EEO AND WORKPLACE DIVERSITY

The Institute reviewed and updated its Workplace Diversity Policy, incorporating Equal Employment Opportunity, in June 2004. The Institute acknowledges differences, and adapts work practices to create an inclusive environment in which diverse skills, perspectives and backgrounds are valued.

HARASSMENT

Staff must comply with Division 4 of the CAC Act and sections of the Institute's Terms and Conditions of Service. Council members also abide by the Code of Conduct for Directors published by the Australian Institute of Company Directors.

AIMS has trained Workplace Harassment Contact Officers across the Institute; they are available to discuss in confidence any issues raised by a staff member. Staff have undertaken harassment awareness training, and new staff are provided with this information as part of the induction process.

In 2003-2004 the Institute had no formally reported cases of harassment, although Harassment Contact Officers gave advice on several occasions. Counselling from the AIMS Employee Assistance Services was obtained.

DISABILITY STRATEGY

The Institute is committed to ensuring people with disabilities are given opportunities for independence, access and full participation. The Institute assesses cases individually and endeavours to implement the most appropriate measures to assist people with disabilities.

All vacancies placed in the print media and on the World Wide Web clearly state that AIMS is an equal opportunity employer.

The physical resources of AIMS continue to be upgraded to meet access needs for people with disabilities.

EMPLOYEE ASSISTANCE PROGRAM

Employee Assistance Services of North Queensland continued to provide the Institute with its Employee Assistance Program. During the reporting period, approximately 5% of staff accessed the counselling service, showing steady use of the service over the last four years.

FREEDOM OF INFORMATION

No requests were received in 2003-2004 under the provisions of the *Freedom of Information Act 1982* (FOI Act). The statement required under Section 8 of the FOI Act, setting out documents available for inspection, is at Appendix 3.

CUSTOMER SERVICE CHARTER

The AIMS Service Charter for dealing with clients is posted to our website. The Institute welcomes feedback on how well it is delivering our services against the standards set in this charter, and has included a feedback form on the website. Both the charter and the feedback form can be found at www.aims.gov.au/pages/about/corporate/csc-01.html

Auditor General's Report

Auditor General's Report
Statement by Directors
Financial Statements at 30 June 2004

Auditor General's Report



INDEPENDENT AUDIT REPORT

To the Minister for Education, Science and Training

Scope

The financial statements and directors' responsibility

The financial statements comprise:

- Statement by Directors (Members of Council) and Chief Executive;
- Statements of Financial Performance, Financial Position and Cash Flows;
- Schedules of Commitments and Contingencies; and
- Notes to and forming part of the Financial Statements

of the Australian Institute of Marine Science for the year ended 30 June 2004.

The directors of the Institute are responsible for the preparation and true and fair presentation of the financial statements in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*. This includes responsibility for the maintenance of adequate accounting records and internal controls that are designed to prevent and detect fraud and error, and for the accounting policies and accounting estimates inherent in the financial statements.

Audit approach

I have conducted an independent audit of the financial statements in order to express an opinion on them to you. My audit has been conducted in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing and Assurance Standards, in order to provide reasonable assurance as to whether the financial statements are free of material misstatement. The nature of an audit is influenced by factors such as the use of professional judgement, selective testing, the inherent limitations of internal control, and the availability of persuasive, rather than conclusive, evidence. Therefore, an audit cannot guarantee that all material misstatements have been detected.

While the effectiveness of management's internal controls over financial reporting was considered when determining the nature and extent of audit procedures, the audit was not designed to provide assurance on internal controls.

GPO Box 707 CANBERRA, ACT 2601
 Centenary House 18 National Circuit
 BARTON ACT
 Phone (02) 6263 7300 Fax (02) 6263 7777

I have performed procedures to assess whether, in all material respects, the financial statements present fairly, in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*, Accounting Standards and other mandatory financial reporting requirements in Australia, a view which is consistent with my understanding of the Institute's financial position, and of its performance as represented by the statements of financial performance, and cash flows.

The audit opinion is formed on the basis of these procedures, which included:

- examining, on a test basis, information to provide evidence supporting the amounts and disclosures in the financial statements; and
- assessing the appropriateness of the accounting policies and disclosures used, and the reasonableness of significant accounting estimates made by the directors of the Institute.

Independence

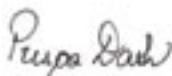
In conducting the audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate Australian professional ethical pronouncements.

Audit Opinion

In my opinion, the financial statements:

- (i) have been prepared in accordance with the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997* and applicable Accounting Standards; and
- (ii) give a true and fair view, of the matters required by applicable Accounting Standards and other mandatory professional reporting requirements in Australia, and the Finance Minister's Orders, of the financial position of the Australian Institute of Marine Science as at 30 June 2004, and of its performance and cash flows for the year then ended.

Australian National Audit Office



Purna Dash
Acting Executive Director
Delegate of the Auditor-General

Canberra
15 September 2004

Financial Statements

- Statement by Directors
- Statement of Financial Performance for the year ended 30 June 2004
- Statement of Financial Position as at 30 June 2004
- Statement of Cash Flows for the year ended 30 June 2004
- Schedule of Commitments as at 30 June 2004
- Schedule of Contingencies as at 30 June 2004
- Notes to and Forming Part of the Financial Statements
- Supplementary Financial Information for the year ended 30 June 2004 (unaudited)

AUSTRALIAN INSTITUTE OF MARINE SCIENCE**STATEMENT BY DIRECTORS (MEMBERS OF COUNCIL) AND CHIEF EXECUTIVE**

In our opinion, the attached financial statements for the year ended 30 June 2004 are based on properly maintained financial records and give a true and fair view of the matters required by the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Institute will be able to pay its debts as and when they become due and payable.

This statement is made in accordance with a resolution of the Council of the Australian Institute of Marine Science.



A E de N Rogers A.O.
Chairman of Council
13 September 2004



Dr Ian Poiner
Director and Member of Council
13 September 2004

STATEMENT OF FINANCIAL PERFORMANCE

for the year ended 30 June 2004

	Notes	2004 \$'000	2003 \$'000
REVENUE			
Revenues from ordinary activities			
Revenues from Government	5A	22,134	26,094
Goods and Services	5B	5,368	5,576
Interest	5C	790	674
Revenue from sale of assets	5D	501	183
Revenue from sale of investments	5E	456	-
Reversals of previous asset writedowns	5F	-	163
Revenue from related entities	5G	2,142	-
Other revenues	5H	107	318
Revenues from ordinary activities		31,498	33,008
EXPENSE			
Expenses from ordinary activities			
Employees	6A	13,232	12,582
Suppliers	6B	10,430	10,015
Depreciation	6C	4,501	4,123
Grants	6D	483	155
Value of assets sold	5D	675	510
Value of investments sold	5E	400	-
Write-down of assets	6E	749	-
Expenses from ordinary activities		30,470	27,385
Operating surplus from ordinary activities		1,028	5,623
Net profit		1,028	5,623
Net credit to revaluation reserve	10A	-	2,806
Decrease in accumulated results on application of transitional provisions due to change in accounting standard AASB 1028			
Employee Benefits	10A	-	(77)
Total revenues, expenses and valuation adjustments recognised directly in equity		-	2,729
Total changes in equity other than those resulting from transactions with the Australian Government as owner		1,028	8,352

The above statements should be read in conjunction with the accompanying notes.

STATEMENT OF FINANCIAL POSITION*as at 30 June 2004*

	Notes	2004 \$'000	2003 \$'000
ASSETS			
Financial assets			
Cash	7A	98	192
Investments	7B	16,909	11,047
Receivables	7C	2,172	1,878
Total financial assets		19,179	13,117
Non-financial assets			
Buildings and improvements	8A	29,151	30,017
Plant and equipment	8B	16,401	16,275
Inventories	8E	239	250
Intangibles	8C	87	76
Other	8F	545	516
Total non-financial assets		46,423	47,134
Total assets		65,602	60,251
LIABILITIES			
Provisions			
Employees	9A	5,829	5,726
Total provisions		5,829	5,726
Payables			
Suppliers	9B	1,795	1,151
Consultancies and grants	9C	4,891	1,315
Total Payables		6,686	2,466
Total liabilities		12,515	8,192
NET ASSETS		53,087	52,059
EQUITY			
Contributed equity	10A	31,607	31,607
Reserves	10A	17,677	17,677
Accumulated surplus	10A	3,803	2,775
Total equity interest		53,087	52,059
Total equity		53,087	52,059
Current liabilities		7,949	4,226
Non-current liabilities		4,566	3,966
Current assets		18,013	13,109
Non-current assets		47,589	47,142

The above statement should be read in conjunction with the accompanying notes.

STATEMENT OF CASH FLOWS

for the year ended 30 June 2004

	Notes	2004 \$'000	2003 \$'000
OPERATING ACTIVITIES			
Cash received			
Appropriations		22,112	26,094
Goods and Services		4,924	6,122
Interest		492	698
GST recovered		856	1,145
Revenue from related entities		6,000	-
Other		107	319
Total cash received		34,491	34,378
Cash used			
Grants		483	155
Employees		13,053	12,106
Suppliers		11,695	12,502
Total cash used		25,231	24,763
Net cash from operating activities	11A	9,260	9,615
INVESTING ACTIVITIES			
Cash received			
Proceeds from sale of property, plant and equipment		501	183
Proceeds from sale of investments		456	-
Total cash received		957	183
Cash used			
Purchase of property, plant and equipment		4,449	5,056
Total cash used		4,449	5,056
Net cash used by investing activities		(3,492)	(4,873)
FINANCING ACTIVITIES			
Cash received			
Appropriations-Contributed equity		-	3,420
Total cash received		-	3,420
Cash used			
Capital use charge paid		-	5,151
Total cash used		-	5,151
Net cash used by financing activities		-	(1,731)
Net increase in cash held		5,768	3,011
Cash at beginning of the reporting period		11,239	8,228
Cash at the end of the reporting period	11B	17,007	11,239

The above statement should be read in conjunction with the accompanying notes.

SCHEDULE OF COMMITMENTS

as at 30 June 2004

	2004 \$'000	2003 \$'000
By Type		
Capital Commitments		
Buildings ¹	109	25
Plant and equipment ²	3,298	738
Total capital commitments	3,407	763
Other Commitments		
Operating leases ³	203	432
CRC Reef	4,610	6,914
Contracts ⁴	3,358	5,707
Other ⁵	2,481	1,801
Total other commitments	10,652	14,854
Commitments receivable	(1,262)	(1,382)
Net commitments	12,797	14,235
By Maturity		
Capital commitments		
One year or less	3,077	694
From one to five years	330	69
Total capital commitments	3,407	763
Operating lease commitments		
One year or less	147	267
From one to five years	56	165
Total operating lease commitments	203	432
CRC Reef commitments		
One year or less	2,360	2,523
From one to five years	2,250	4,391
Total CRC Reef commitments	4,610	6,914
Contract commitments		
One year or less	778	2,570
From one to five years	2,580	3,137
Total contract commitments	3,358	5,707
Other commitments		
One year or less	1,758	1,471
From one to five years	723	330
Total other commitments	2,481	1,801
Commitments receivable	(1,262)	(1,382)
Net Commitments	12,797	14,235

Commitments are GST inclusive where relevant

¹ Outstanding contractual payments for building under refurbishment.

² Include outstanding purchase orders for plant and equipment.

³ Operating leases included are effectively non-cancellable and comprise:

Nature of lease	General description of leasing arrangement
Motor Vehicles	Leases are for a period of 24 months or 60,000 kilometres No contingent rentals exist
Telephone system	Leases are for a period of 36 months and cover the cost of installation and annual maintenance

⁴ Contracts, include site maintenance, management of vessels and rent on offices in Perth and Darwin, rent period is for a further two years as at 30 June 2004.

⁵ As at 30 June 2004 other commitments comprise amounts payable under grants agreements in respect of which the recipient is yet to perform the services required.

The above schedule should be read in conjunction with the accompanying notes.

SCHEDULE OF CONTINGENCIES

as at 30 June 2004

UNQUANTIFIABLE CONTINGENCIES

At 30 June 2004, the Institute had a legal claim against it for damages. The Institute has denied liability and is defending the claim. It is not possible to estimate the outcome of this claim.

The above schedule should be read in conjunction with the accompanying notes.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note	Description
1	Summary of Significant Accounting Policies
2	Adoption of Australian Equivalents to International Financial Reporting Standards from 2005-2006
3	Economic Dependency
4	Events Occurring After Reporting Date
5	Operating Revenues
6	Operating Expenses
7	Financial Assets
8	Non-Financial Assets
9	Provisions and Payables
10	Equity
11	Cash Flow Reconciliation
12	External Financing Arrangements
13	Remuneration of Directors
14	Related Party Disclosures
15	Remuneration of Officers
16	Remuneration of Auditors
17	Financial Instruments
18	Employee Equivalent
19	Reporting of Outcomes

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

NOTE 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

1.1 Basis of Accounting

The financial statements are required by clause 1(b) of Schedule 1 to the *Commonwealth Authorities and Companies Act 1997* and are a general-purpose financial report.

The statements have been prepared in accordance with:

- ☐ Finance Minister's Orders (being the Commonwealth Authorities and Companies (Financial Statements for reporting periods ending on or after 30 June 2004));
- ☐ Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Board; and
- ☐ Consensus Views of the Urgent Issues Group.

The Institute's Statement of Financial Performance and Financial Position have been prepared on an accrual basis and are in accordance with historical cost convention, except for certain assets, which, as noted, are at valuation. Except where stated, no allowance is made for the effects of changing prices on the results or the financial position.

Assets and liabilities are recognised in the Institute's Statement of Financial Position when and only when it is probable that future economic benefits will flow and the amounts of the assets or liabilities can be reliably measured. Assets and liabilities arising under agreements equally proportionately unperformed are however not recognised unless required by an Accounting Standard. Liabilities and assets that are unrecognised are reported in the Schedule of Commitments and the Schedule of Contingencies.

Revenues and expenses are recognised in the Institute's Statement of Financial Performance when and only when the flow or consumption or loss of economic benefits has occurred and can be reliably measured.

1.2 Changes in Accounting Policy

The accounting policies used in the preparation of these financial statements are consistent with those used in 2002-03.

1.3 Revenue

The revenues described in this Note are revenues relating to the core operating activities of the Institute.

Revenue from the sale of goods is recognised upon the delivery of goods to customers.

Interest revenue is recognised on a time proportionate basis that takes into account the effective yield on the relevant assets.

Revenue from disposal of non-current assets is recognised when control of the asset has passed to the buyer.

Revenue from the rendering of a service is recognised by reference to the stage of completion of contracts. The stage of completion is determined according to the proportion that costs incurred to date bear to the estimated total costs of the transaction.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Revenues from Government – Output Appropriations

The full amount of the appropriation for departmental outputs for the year is recognised as revenue.

Resources Received Free of Charge

Services received free of charge are recognised as revenue when and only when a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense.

Contributions of assets at no cost of acquisition or for nominal consideration are recognised at their fair value when the asset qualifies for recognition.

1.4 Transactions by the Government as Owner

Equity Injections

Amounts appropriated by the Parliament as equity injections are recognised as 'contributed equity' in accordance with the Finance Ministers Orders.

1.5 Employee Benefits

Benefits

Liabilities for services rendered by employees are recognised at the reporting date to the extent that they have not been settled.

Liabilities for wages and salaries (including non-monetary benefits), annual leave, sick leave are measured at their nominal amounts. Other employee benefits expected to be settled within 12 months of their reporting date are also measured at their nominal amounts.

The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability.

All other employee benefit liabilities are measured as the present value of the estimated future cash outflows to be made in respect of services provided by employees up to the reporting date.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. No provision has been made for sick leave as all sick leave is non-vesting and the average sick leave taken in future years by employees of the Institute is estimated to be less than the annual entitlement for sick leave.

The leave liabilities are calculated on the basis of employees' remuneration, including the Institute's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The non current portion of the liability for long service leave is recognised and measured at the present value of the estimated future cash flows to be made in respect of all employees at 30 June 2004. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Superannuation

Employees are members of the Commonwealth Superannuation Scheme and the Public Sector Superannuation Scheme. The liability for their superannuation benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course.

The Institute makes employer contributions to the Australian Government at rates determined by an actuary to be sufficient to meet the cost to the Government of the superannuation entitlements of the Institute's employees.

1.6 Leases

The Institute only has operating leases. Operating lease payments are expensed on a basis which is representative of the pattern of benefits derived from the leased assets.

1.7 Grants

Most grant agreements require the grantee to perform services, provide facilities or meet eligibility criteria. In these cases, the Institute recognises grant liabilities only to the extent that the services required have been performed or the eligibility criteria have been satisfied by the grantee.

In cases where grant agreements are made without conditions to be monitored, liabilities are recognised on signing the agreement.

1.8 Cash

Cash means notes and coins held and any deposits held at call with a bank or financial institution. Cash is recognised at its nominal amount. Interest is credited to revenue as it accrues.

1.9 Loans Receivable

Loans are recognised at the amounts lent. Provision is made for doubtful loans when collection of the loan or part thereof is judged to be less rather than more likely.

1.10 Appropriations Receivable

These receivables are recognised at the nominal amounts due.

1.11 Other Financial Liabilities

Trade creditors and accruals are recognised at their nominal amounts, being the amounts at which the liabilities will be settled. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

1.12 Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken.

1.13 Property (Buildings), Plant and Equipment

Asset Recognition Threshold

Purchases of property, plant and equipment are recognised initially at cost in the Statement of Financial Position, except for purchases costing less than \$2,000, which are expensed in the year of acquisition (other than where they form part of a group of similar items which are significant in total).

Revaluations

The basis for revaluation of buildings, infrastructure, plant and equipment as at 31 December 2002 was at fair value. All valuations are carried out by an independent valuer.

NOTES TO AND FORMING PART OF THE
FINANCIAL STATEMENTS
for the year ended 30 June 2004

Frequency
The current policy is to revalue assets every three years. Refer note 2 for discussion of this policy under International Financial Reporting Standards.

Depreciation
Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Institute using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives) and methods are reviewed at each balance date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate. Residual values are re-estimated for a change in prices only when assets are revalued.

Depreciation rates applying to each class of depreciable asset are based on the following useful lives:

	2004	2003
Buildings and improvements	10 to 40 years	10 to 40 years
Plant and equipment	3 to 20 years	3 to 20 years
Software	3 to 12 years	3 to 12 years

The aggregate amount of depreciation allocated for each class of asset during the reporting period is disclosed in Note 6C.

1.14 Impairment of Non-Current Assets

Non-current assets carried at up-to-date fair value at the reporting date are not subject to impairment testing. Non-current assets carried at cost or deprival value and held to generate net cash inflows have been tested for their recoverable amounts at the reporting date. The test compared the carrying amounts against the net present value of future net cash inflows. No write-down to recoverable amount was required (2003: nil).

The non-current assets carried at cost or deprival value, which are not held to generate net cash inflows, have been assessed for indications of impairment. Where indications of impairment exist, the carrying amount of the asset is compared to its net selling price and depreciated replacement cost and is written down to its higher of the two amounts, if necessary. No write-down was required in 2003-04 (2003: nil).

1.15 Inventories

Inventories held for resale are valued at the lower of cost and net realisable value.

Inventories not held for resale are valued at cost, unless they are no longer required, in which case they are valued at net realisable value.

Costs incurred in bringing each item of inventory to its present location and condition is assigned on a first-in-first out basis.

1.16 Taxation

The Institute is exempt from all forms of taxation except fringe benefits tax and the goods and services tax (GST). Revenues, expenses and assets are recognised net of GST:

- ☐ except where the amount of GST incurred is not recoverable from the Australian Taxation Office; and
- ☐ except for receivables and payables.

1.17 Foreign Currency

Transactions denominated in a foreign currency are converted at the exchange rate at the date of the transaction. Foreign currency receivables and payables are translated at the exchange rates current as at balance date. Associated currency gains and losses are not material.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

1.18 Insurance

The Institute has insured for risks through the Government's insurable risk managed fund, called 'Comcover' with the exception of two vessels. The vessels are insured with a commercial insurer. Workers compensation is insured through Comcare Australia.

1.19 Investments

The Institute acquired shares in AMRAD Corporation Ltd in October 2002 arising from a research collaboration agreement that was in place prior to transfer of the shares to the Institute. During the year the Council had resolved to sell the shares. The sale of the entire shareholding was completed in October 2003. The profit from the sale has been included in the financial statements. No capital gains tax was recognised in the financial statements as the Institute is exempt from such tax.

The Institute retains an investment in a spin off company Cleveland Biosensors Pty Ltd (CBPL). The company was formerly known as ToxiTech Pty Ltd. The Institute's shareholding has been diluted from 50% to 12.5 % as a result of capital funding being provided by new investors. The investment is 100 shares at a total value of \$100. This is not a controlling ownership and so does not require consolidation of Cleveland Biosensors Pty Ltd in the Institute's accounts.

1.20 Reporting of Administered Activities

The Institute has no administered activities.

1.21 Bad and Doubtful Debts

Bad debts are expensed during the year in which they are identified, to the extent they have not previously been provided for. A provision is raised for doubtful debts based on a review of all outstanding receivables at year end.

The Institute has made a loan to a start up company. Given the uncertainty of the development of the company the Institute has fully provided for the possibility of non payment of the loan.

1.22 Comparative Figures

Where necessary, comparative figures have been adjusted to conform to changes in presentation in these financial statements.

1.23 Research, Development and Intellectual Property

Costs associated with research and development, intellectual property, patents and trade marks are expensed as incurred unless it can be established that they are recoverable beyond reasonable doubt.

1.24 Contract Research

The Institute has entered into various agreements with external parties for the research and development of technologies and scientific knowledge. Details of the ownership of intellectual property vary from agreement to agreement. These arrangements do not involve sharing in common of liabilities and interest in assets, other than assets represented by intellectual property to which the Institute does not attribute any value in the accounts.

1.25 Consultancies and Grants

Various consultancies and grants have been made to the Institute for specific research projects, seminar, workshops and employment assistance. Monies are paid either in advance or arrears and the difference at 30 June is reflected as either creditors or receivables respectively.

1.26 Rounding

Amounts are rounded to the nearest \$1,000 except in relation to:

- ☐ remuneration of directors (members of council);
- ☐ remuneration of officers; and
- ☐ remuneration of auditors.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 2: Adoption of Australian Equivalents to International Financial Reporting Standards from 2005-2006.

The Australian Accounting Standards Board has issued replacement Australian Accounting Standards to apply from 2005-06. The new standards are the Australian Equivalents to International Financial Reporting Standards (IFRSs) which are issued by the International Accounting Standards Board.

The purpose of issuing Australian Equivalents to IFRSs is to enable Australian entities reporting under the Corporations Act 2001 to be able to more readily access overseas capital markets by preparing their financial reports according to accounting standards more widely used overseas.

It is expected that the Finance Minister will continue to require compliance with the Accounting Standards issued by the AASB, including the Australian Equivalents to IFRSs, in his Orders for the Preparation of Authorities' financial statements for 2005-06 and beyond.

The AASB Equivalents contain certain additional provision which will apply to not-for-profit entities, including Australian Government authorities. Some of these provisions are in conflict with the IFRSs and therefore the Institute will only be able to assert compliance with the AASB Equivalents to the IFRSs.

Accounting Standard AASB 1047 *Disclosing the Impact of Adopting Australian Equivalents to IFRSs* requires that the financial statements for 2003-04 disclose:

- ☐ An explanation of how the transition to the Australian Equivalents is being managed, and
- ☐ A narrative explanation of the key differences in accounting policies arising from the transition.

The purpose of this Note is to make these disclosures.

The Institute's plan for transition to AASB Equivalents to IFRSs includes:

- ☐ Identification of all major accounting policy differences, if any, between current AASB standards and AASB Equivalents to IFRSs.
- ☐ Identification of system changes necessary to be able to report under the AASB Equivalents, including those necessary to enable capture of data under both sets of rules for 2004-05, and the testing and implementation of those changes.
- ☐ Preparation of transitional balance sheet as at 1 July 2004, under AASB Equivalents, within three months of 30 June 2004.
- ☐ Preparation of an AASB Equivalent balance sheet at the same time as the 30 June 2005 statements are prepared.
- ☐ Meeting reporting deadlines set by Department of Finance and Administration for 2005-06 balance sheet under AASB Equivalent Standards.

Major changes in accounting policy under AASB Equivalents:

Changes in accounting policies are applied retrospectively i.e. as if the policy had always applied. This rule means that a balance sheet prepared under AASB Equivalents must be made as at 1 July 2004, except for specific exemptions allowed under AASB 1. *First time Adoption of Australian Equivalents to International Financial Standards*. This will enable the 2005-06 financial statements to report comparatives under the Australian Equivalents also.

- ☐ **Property, plant and equipment**
It is expected that the Finance Minister's Orders will require property plant and equipment assets carried at valuation in 2003-04 to be measured at up-to-date fair value from 2005-06. This differs from the accounting policies currently in place for these assets which, up to and including 2003-04, have been revalued every three years and which currently include assets at cost (for purchases since the commencement of the cycle) and at fair value.

However, it is important to note that the Finance Minister requires these assets to be measured at up-to-date fair value as at 30 June 2005.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

❑ **Impairment of non-current assets**

The Institute's policy on impairment of non-current assets is in Note 1.14.

Under the new equivalent standards, these assets will be subject to an assessment for impairment and, if there are indications of impairment, measurement of any impairment. The impairment test is that the carrying amount of an asset must not exceed the greater of (a) its fair value less cost to sell and (b) its value in use. 'Value in use' is the net present value of net cash inflows for for-profit assets of the Institute and depreciated replacement cost for other assets which would be replaced if the Institute was deprived of them.

❑ **Employee Benefits**

The provision for long service leave is measured at the present value of estimated future cash outflows using market yields as at the reporting date on national government bonds.

Under the new AASB Equivalent standard, the same discount rate will be used unless there is a deep market in high quality corporate bonds, in which case the market yield on such bonds must be used.

NOTE 3. ECONOMIC DEPENDENCY

The Australian Institute of Marine Science was established by an Act of Parliament, *The Australian Institute of Marine Science Act 1972* and is controlled by the Commonwealth of Australia.

The Institute is dependent on appropriations from the Parliament of the Commonwealth for its continued existence and ability to carry out its normal activities.

NOTE 4. EVENTS OCCURRING AFTER REPORTING DATE

The Institute is not aware of any material events that have occurred since the balance date.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
Note 5. OPERATING REVENUES		
5A Revenues from Government		
Appropriation operating	17,841	17,202
Appropriation asset replacement	4,293	3,636
Appropriation capital use charge	-	5,256
Total revenues from government	22,134	26,094
5B Sales of Goods and Services		
Goods	118	224
Services	5,250	5,352
Total sales of goods and services	5,368	5,576
Provision of goods to:		
Related entities	-	-
External entities	118	224
Total sales of goods	118	224
Rendering of services to:		
Related entities	572	336
External entities	4,678	5,016
Total rendering of services	5,250	5,352
Cost of sales of goods	104	180
5C Interest Revenue		
Term deposits	790	674

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 5. OPERATING REVENUE (CONTINUED)

5D	Net Gain from Sales of Assets		
	Plant and equipment:		
	Proceeds from disposal	501	183
	Net book value of assets disposed	(570)	(163)
	Net gain / (loss) from disposal of plant and equipment	(69)	20
	Write-offs	(105)	(347)
	Net loss on disposal of plant and equipment	(174)	(327)
	Total proceeds from disposals	501	183
	Total value of assets disposed	(675)	(510)
	Total net loss from disposal of assets	(174)	(327)
5E	Net Gain from Sales of Investment		
	Proceeds from disposal	456	-
	Net book value of investment disposed	(400)	-
	Net gain from disposal of investment	56	-
	Total proceeds from disposal	456	-
	Total value of investments disposed	(400)	-
	Total net gain from disposal of investments	56	-
5F	Reversal of previous asset write-downs		
	Asset revaluation increment - computers	-	163
	Total reversals of previous asset write-downs	-	163
5G	Revenue from related entities		
	Funds received from Department of Education, Science & Training		
	Infrastructure	2,100	-
	Aims @ JCU	42	-
	Total revenue from related entities	2,142	-
5H	Other Revenue		
	Insurance claims	59	163
	Unrealised gain on investment	-	140
	Other	48	15
	Total other revenue	107	318

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 6. OPERATING EXPENSES		
6A Employee Expenses		
Wages and salaries	9,709	9,542
Superannuation	1,582	1,357
Annual recreation leave	1,272	1,099
Long service leave	340	308
Fringe benefits tax	239	217
Total employee benefits expenses	13,142	12,523
Workers compensation insurance	90	59
Total employee expenses	13,232	12,582

The Institute contributes to the Commonwealth Superannuation (CSS) and Public Sector Superannuation (PSS) schemes which provide retirement, death and disability benefits to employees. Contributions to the schemes are at rates calculated to cover existing and emerging obligations. Current contribution rates are 22.9% of salary (CSS) and 10.3% of salary (PSS). An additional 3% is contributed for employee productivity benefits.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 6. OPERATING EXPENSES (CONTINUED)		
6B Supplier Expenses		
Operating lease rentals	245	270
Supply of goods and services		
Appointment expenses	184	46
Equipment and software purchases	280	266
Catering subsidy	78	81
Chemical supplies	36	42
Cleaning and ground maintenance	212	202
Communications, telephone, postage	473	391
Consultancies	58	37
Contractors	1,127	1,123
Consumables	556	713
Electricity	512	494
Field costs	35	55
Freight	197	204
Fuel, oil, distillates	409	417
Hire of equipment	341	130
Insurances	331	299
Laboratory expenses	183	189
Legal expenses	109	91
Licences and fees	186	215
Patents and trade marks	97	104
Publications, journals, subscriptions	304	467
Rent	48	128
Repairs and maintenance	1,189	1,016
Security	157	146
Stationery	79	92
Training, seminars and conferences	127	104
Travel and accommodations	1,141	993
Vessels management and staffing	1,589	1,546
Victuals	67	64
Water	80	90
Total supplier expenses	10,430	10,015
Goods from related entities	-	-
Goods from external entities	2,106	2,718
Services from related entities	611	485
Services from external parties	7,468	6,542
Operating lease rentals	245	270
Total supplier expenses	10,430	10,015

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 6. OPERATING EXPENSES (CONTINUED)		
6C Depreciation		
Depreciation property, plant and equipment	<u>4,501</u>	<u>4,123</u>
The aggregate amounts of depreciation expensed during the reporting period for each class of depreciable asset are as follows:		
Building and improvements	1,350	1,263
Computer equipment	903	857
Library	226	177
Office equipment	49	43
Plant and equipment	1,432	1,224
Ships, launches and vessels	316	378
Vehicles	193	164
Software	<u>32</u>	<u>17</u>
Total depreciation	<u>4,501</u>	<u>4,123</u>
<hr/>		
6D Grants		
Non-profit institutions	<u>483</u>	<u>155</u>
The Institute provides grants to various organisations for the purpose of marine science research.		
<hr/>		
6E Write-Down of Assets		
Bad and doubtful debts expense	<u>749</u>	<u>-</u>
<hr/>		

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 7. FINANCIAL ASSETS		
7A Cash		
Cash on hand	5	5
Cash at bank	93	137
Deposits at call	-	50
Total cash	98	192
7B Investments		
Term deposits	16,909	10,647
Shares in listed company	-	400
Total investments	16,909	11,047
Investments are categorised as follows:		
Current	14,959	10,647
Non-current	1,950	400
Total investments	16,909	11,047
7C Receivables		
Goods and services	1,257	758
Less : Provision for doubtful debts	(20)	(3)
	1,237	755
Loan	729	374
Less : Provision for doubtful debts	(729)	-
	-	374
Interest receivable	319	-
GST receivable	7	9
Other receivables	609	740
Total receivables (net)	2,172	1,878
Receivables (gross) are aged as follows :		
Not Overdue	2,006	1,758
Overdue by:		
Less than 30 days	156	1
30 to 60 days	2	111
60 to 90 days	-	8
More than 90 days	757	3
	915	123
Total receivables (gross)	2,921	1,881
The provision for doubtful debts is aged as follows:		
Not Overdue	-	-
Overdue by:		
Less than 30 days	-	-
30 to 60 days	-	-
60 to 90 days	-	-
More than 90 days	749	3
Total provision for doubtful debts	749	3
Receivables are categorised as follows:		
Current	2,172	1,504
Non-current	-	374
Total receivables	2,172	1,878

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 8. NON-FINANCIAL ASSETS		
8A Buildings and improvements		
Buildings and improvements at independent valuation 31 December 2002 (fair value)	30,339	30,443
Accumulated depreciation	<u>(1,975)</u>	<u>(659)</u>
	<u>28,364</u>	<u>29,784</u>
 Buildings and improvements at cost	 601	 236
Accumulated depreciation	<u>(32)</u>	<u>(3)</u>
	<u>569</u>	<u>233</u>
 Capital work in progress	 <u>218</u>	 <u>-</u>
Total buildings and improvements	29,151	30,017
<hr/>		
8B Plant and equipment and other		
Plant and equipment		
Plant and equipment at independent valuation 31 December 2002 (fair value)	6,588	6,690
Accumulated depreciation	<u>(1,836)</u>	<u>(652)</u>
	<u>4,752</u>	<u>6,038</u>
 Plant and equipment at cost	 1,943	 677
Accumulated depreciation	<u>(231)</u>	<u>(19)</u>
	<u>1,712</u>	<u>658</u>
 Work in progress-at cost	 <u>1,342</u>	 <u>239</u>
Total plant and equipment	7,806	6,935

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)		
8B. Plant and equipment and other (continued)		
Computer equipment		
Computer equipment at independent valuation 31 December 2002 (fair value)	1,886	1,984
Accumulated depreciation	<u>(1,123)</u>	<u>(406)</u>
	<u>763</u>	<u>1,578</u>
 Computer equipment at cost	 671	 105
Accumulated depreciation	<u>(141)</u>	<u>(9)</u>
	<u>530</u>	<u>96</u>
Total computer equipment	1,293	1,674
 Vehicles		
Vehicles at independent valuation 31 December 2002 (fair value)	219	738
Accumulated depreciation	<u>(63)</u>	<u>(76)</u>
	<u>156</u>	<u>662</u>
 Vehicles at cost	 854	 133
Accumulated depreciation	<u>(93)</u>	<u>(11)</u>
	<u>761</u>	<u>122</u>
Total vehicles	917	784
 Office equipment		
Office equipment at independent valuation 31 December 2002 (fair value)	177	180
Accumulated depreciation	<u>(52)</u>	<u>(18)</u>
	<u>125</u>	<u>162</u>
 Office equipment at cost	 52	 13
Accumulated depreciation	<u>(15)</u>	<u>-</u>
	<u>37</u>	<u>13</u>
Total office equipment	162	175

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)		
8B. Plant and equipment and other (continued)		
Ships, launches and vessels		
Ships, launches and vessels at independent valuation 31 December 2002 (fair value)	4,139	4,201
Accumulated depreciation	<u>(428)</u>	<u>(141)</u>
	<u>3,711</u>	<u>4,060</u>
 Ships, launches and vessels at cost	 173	 59
Accumulated depreciation	<u>(17)</u>	<u>(2)</u>
	<u>156</u>	<u>57</u>
 Work in progress at cost	 <u>-</u>	 <u>8</u>
Total ships, launches and vessels	3,867	4,125
 Library books		
Library books at independent valuation 31 December 2002 (fair value)	2,694	2,694
Accumulated depreciation	<u>(338)</u>	<u>(112)</u>
	<u>2,356</u>	<u>2,582</u>
 Total library books	 2,356	 2,582
 Total plant and equipment and other	 16,401	 16,275

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)		
8B. Plant and equipment and other (continued)		
Revaluations are at independent valuation in accordance with the revaluation policy stated at Note 1. In 2002, the revaluations were conducted by an independent valuer Australian Pacific Valuers.		
Movement in Asset Revaluation Reserve		
decrement for buildings	-	(1,748)
increment for computers	-	629
increment for motor vehicles	-	13
increment for office equipment	-	100
increment for plant and equipment	-	3,369
increment ships, launches and vessels	-	114
increment library	-	329
	<u>-</u>	<u>2,806</u>
increment for computer equipment reversed and recognised as revenue (Note 5F)	-	163
<hr/>		
8C Intangibles		
Computer software		
Externally purchased	142	99
Accumulated amortisation	(55)	(23)
Total intangibles	<u>87</u>	<u>76</u>

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 8D Analysis of Property, Plant and Equipment and Intangibles

TABLE A - Reconciliation of the opening and closing balances of property, plant and equipment and intangibles

Item	Buildings	Plant & Equipment	Computers	Vehicles	Office Equipment	Ships & Vessels	Library	Computer Software	TOTAL
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
As at 1 July 2003									
Gross book value	30,679	7,606	2,089	871	193	4,268	2,694	99	48,499
Accumulated depreciation/amortisation	(662)	(671)	(415)	(87)	(18)	(143)	(112)	(23)	(2,131)
Net book value	30,017	6,935	1,674	784	175	4,125	2,582	76	46,368
Additions									
By purchase	581	2,388	567	720	39	109	-	43	4,447
Depreciation/amortisation expense	(1,350)	(1,432)	(903)	(193)	(49)	(316)	(226)	(32)	(4,501)
Disposals									
Other disposals	(97)	(85)	(45)	(394)	(3)	(51)	-	-	(675)
As at 30 June 2004									
Gross book value	31,158	9,873	2,557	1,073	229	4,312	2,694	142	52,038
Accumulated depreciation/amortisation	(2,007)	(2,067)	(1,264)	(156)	(67)	(445)	(338)	(55)	(6,399)
Net book value	29,151	7,806	1,293	917	162	3,867	2,356	87	45,639

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 8D Analysis of Property, Plant and Equipment and Intangibles

TABLE B - Assets at valuation

Item	Buildings	Plant & Equipment	Computers	Vehicles	Office Equipment	Ships & Vessels	Library	Computer Software	TOTAL
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
As at 30 June 2004									
Gross value	30,339	6,588	1,886	219	177	4,139	2,694	-	46,042
Accumulated depreciation/amortisation	(1,975)	(1,836)	(1,123)	(63)	(52)	(428)	(338)	-	(5,815)
Net book value	28,364	4,752	763	156	125	3,711	2,356	-	40,227
As at 30 June 2003									
Gross value	30,443	6,690	1,984	738	180	4,201	2,694	-	46,930
Accumulated depreciation/amortisation	(659)	(652)	(406)	(76)	(18)	(141)	(112)	-	(2,064)
Net book value	29,784	6,038	1,578	662	162	4,060	2,582	-	44,866

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 8. NON FINANCIAL ASSETS (CONTINUED)		
8E Inventories		
All inventories are current assets		
Inventories held for sale	49	49
Stores inventories not held for sale (cost)	190	201
Total inventories	239	250
8F Other Non-Financial Assets		
Workshop jobs in progress	258	277
Prepayments	287	239
Total other non-financial assets	545	516

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 9. PROVISIONS AND PAYABLES		
9A Employee Provisions		
Salaries and wages	-	397
Annual leave	2,554	2,257
Long service leave	3,215	3,002
Fringe benefit tax	59	53
Superannuation	-	9
Aggregate employee entitlement liability	5,828	5,718
Workers compensation	1	8
Aggregate employee benefit liability and related on costs	5,829	5,726
Current	1,263	1,760
Non-Current	4,566	3,966
	5,829	5,726
<hr/>		
9B Supplier Payables		
Trade creditors	1,795	1,151
Total supplier payables	1,795	1,151
<hr/>		
All supplier payables are current		
<hr/>		
9C Consultancies and Grants		
Non-profit institutions	959	1,042
Profit institutions	74	273
Joint venture	3,858	-
Total consultancies and grants	4,891	1,315
<hr/>		
All grants payable are current		
<hr/>		

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

NOTE 10. EQUITY

10A Analysis of Equity

Item	Accumulated Results		Asset revaluation reserve		Total Contributed Equity		TOTAL EQUITY	
	2004	2003	2004	2003	2004	2003	2004	2003
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Opening balance as at 1 July	2,775	2,380	17,677	14,871	31,607	28,187	52,059	45,438
Net profit	1,028	5,623	-	-	-	-	1,028	5,623
Net revaluation increment/(decrement)	-	-	-	2,806	-	-	-	2,806
Increase in accumulated results on application of AASB 1028 <i>Employee Benefits</i>	-	(77)	-	-	-	-	-	(77)
Transactions with owner:								
Distributions to owner:								
Returns on Capital								
Capital Use Charge	-	(5,257)	-	-	-	-	-	(5,257)
Capital Use Charge refund/provision reversal	-	106	-	-	-	-	-	106
Contributions by owner:								
Appropriations (equity injections)	-	-	-	-	-	3,420	-	3,420
Closing balance as at 30 June	3,803	2,775	17,677	17,677	31,607	31,607	53,087	52,059
Total equity attributable to the Commonwealth	3,803	2,775	17,677	17,677	31,607	31,607	53,087	52,059

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	2004 \$'000	2003 \$'000
NOTE 11. CASH FLOW RECONCILIATION		
11A Reconciliation of Operating Surplus to Net Cash from Operating Activities:		
Reconciliation of operating surplus to net cash provided by operating activities		
Operating surplus	1,028	5,623
Non-Cash Items		
Depreciation and amortisation	4,501	4,123
Loss on disposal of non-current assets	619	345
Gain on disposal of non-current assets	(501)	(183)
Changes in Assets and Liabilities		
(Increase)/Decrease in receivables	(294)	(370)
(Increase)/Decrease in inventory	11	(25)
(Increase)/Decrease in other assets	(29)	(207)
Increase/(Decrease) in employees provisions	103	425
Increase/(Decrease) in investments	(400)	(400)
Increase/(Decrease) in supplier payables	644	(124)
Increase/(Decrease) in other payables	3,576	408
Other	2	-
Net cash from operating activities	9,260	9,615
11B Reconciliation of Cash		
Cash balance comprises:		
Cash	98	192
Investments	16,909	11,047
Total cash	17,007	11,239

NOTE 12. EXTERNAL FINANCING ARRANGEMENTS

The Institute has finance facilities with the Commonwealth Bank of Australia as follows:

Total facilities	1,000	1,429
Amount of facility used as at 30 June	-	(6)
Facility available	1,000	1,423

The facilities do not appear on the Statement of Financial Performance.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	Number	
	2004	2003
NOTE 13. REMUNERATION OF DIRECTORS (MEMBERS OF COUNCIL)		
The number of directors of the Institute included in these figures are shown below in the relevant remuneration bands.		
\$10,000 - \$19,999	3	3
\$20,000 - \$29,999	1	1
\$30,000 - \$39,999	1	1
\$80,000 - \$89,999	1	-
\$170,000 - \$179,999	1	-
\$230,000 - \$239,999	-	1
	<u>7</u>	<u>6</u>
	<u>\$</u>	<u>\$</u>
Total remuneration received or due and receivable by Directors of the Institute	367,169	336,604

The Directors (members of council) of the Australian Institute of Marine Science are appointed by the Governor General. The Director (CEO) is appointed by the Governor General on the recommendation of the Board of Directors (members of council).

NOTE 14. RELATED PARTY DISCLOSURES

Directors of the Institute

The Directors (members of council) of the Institute during the year were:

Mr A E de N Rogers A.O. (Chairman)

Dr W Craik

Mr B Guthrie

Dr M Sleigh

Dr I Gould

Professor S Hall (Chief Executive Officer) resigned February 13 2004

Mr P Willers (Acting Chief Executive Officer) from February 13 2004

The aggregate remuneration of Directors is disclosed in Note 13.

Loans to Directors and Director related entities

There were no loans made to any Director or Director related entities during the period.

Other Transactions with Directors or Director related entities

There were no other transactions with Directors or Director related entities during the period.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	Number	
	2004	2003
NOTE 15. REMUNERATION OF OFFICERS		
The number of officers who received or were due to receive total remuneration of \$100,000 or more:		
\$100,000 - \$109,999	-	2
\$110,000 - \$119,999	-	2
\$120,000 - \$129,999	3	-
\$130,000 - \$139,999	2	-
\$140,000 - \$149,999	-	1
\$150,000 - \$159,999	-	1
	5	6
	\$	\$
The aggregate amount of total remuneration of officers shown above.	749,048	771,704

The Officer remuneration includes all officers concerned with or taking part in the management of the Institute during 2003-04 except the Chief Executive Officer. Details in relation to the Chief Executive Officer have been incorporated into Note 13 - Remuneration of Directors.

	2004	2003
	\$	\$

NOTE 16. REMUNERATION OF AUDITORS

Remuneration to the Auditor-General for auditing the financial statements for the reporting period.

The fair value of services provided was:	44,000	42,000
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The Auditor-General received no remuneration for other services during the reporting period.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

NOTE 17. FINANCIAL INSTRUMENTS

Table A. Terms, Conditions and Accounting Policies

Financial Instrument	Notes	Accounting Policies and Methods (including recognition criteria and measurement basis)	Nature of Underlying Instrument (Including significant terms and conditions affecting the amount, timing and certainty of cash flows).
<i>Financial Assets</i>	7	Financial assets are recognised when control over future economic benefits is established and the amount of the benefit can be reliably measured.	
Deposits at call (cash)	7A	Deposits are recognised at their nominal value. Interest is credited as it accrues.	Temporarily surplus funds, mainly from monthly drawdowns of appropriation, are placed on deposit at call with the Institute's banker. Interest is earned on the daily balance at the prevailing daily rate for money on call and is paid at month end.
Receivables for goods and services	7C	These receivables are recognised at the nominal amounts due, less any provisions for bad and doubtful debts. Provisions are made when collection of the debt is judged to be less rather than more likely.	Credit terms are 30 days (2002-03 30 days).
Term deposit	7B	The deposit is recognised at cost. Interest is accrued as it is earned.	Various term deposits are with the Institute's banks, with a maximum maturity of fifteen months from June 30 2004. The term deposits earned an average annual interest rate of 5.18%.
Shares in listed companies	7B	Shares are recognised at the net market value as at the reporting date.	Shares were deemed to the Institute in the year ended 30 June 2003. The Institute disposed of the shares in the financial year ended 30 June 2004.
Interest	7C	Interest is recognised as it is earned.	The Institute invests surplus funds on short and long term deposits, interest is payable on maturity. Interest which has been earned but not yet received is accrued for in the annual accounts.
GST receivable	7C	The Institute is registered for GST and incurs a liability to the Australian Taxation Office for sales and a receivable is generated for purchases.	The GST receivable balance is the net of transactions accrued as at balance date.
Other receivables	7C	The Institute enters into contracts for the supply of services, the receivable is recognised where expenses have been incurred and payment has not been invoiced.	Payment arrangements for contracts generally involve payment for achieving specified milestones. Expenses can be incurred in achieving the milestones, before an invoice is raised to the client.
Long term loan	7C	The loan is recognised at cost.	The Institute has a loan to a start up company (refer Note 1.19). The cost has been fully provided for in doubtful debts as there is some doubt as to the collectability of the loan.
<i>Financial Liabilities</i>		Financial liabilities are recognised when a present obligation to another party is entered into and the amount of the liability can be reliably measured.	
Trade creditors	9B	Creditors and accruals are recognised at their nominal amounts, being the amounts at which the liabilities will be settled. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).	Settlement is usually made based on the settlement period established for individual trade creditors being 7,14 or 30 days.
Grants payable	9C	This payable is recognised as the value of the work outstanding on grants where money is received in advance.	Grants range in maturity from a few weeks to three years. Amounts recognised are reduced as the work is undertaken by the Institute in accordance with the contract.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 17. FINANCIAL INSTRUMENTS (CONTINUED)

Table B Interest Rate Risk

Financial Instrument	Notes	Floating Interest		Fixed Interest Rate Maturing In				Non - Interest		Total		Weighted Average Effective Interest Rate	
		Rate		1 Year or less		1 to 5 Years		Bearing					
		2004 \$'000	2003 \$'000	2004 \$'000	2003 \$'000	2004 \$'000	2003 \$'000	2004 \$'000	2003 \$'000	2004 \$'000	2003 \$'000	2004 %	2003 %
Financial Assets (Recognised)													
Cash at bank	7A	93	137	-	-	-	-	-	-	93	137	2.75	2.74
Cash on hand	7A	-	-	-	-	-	-	5	5	5	5	n/a	n/a
Deposits at call	7A	-	50	-	-	-	-	-	-	-	50	n/a	4.42
Receivables for goods and services and accrued income	7C	-	-	-	-	-	-	1,257	758	1,257	758	n/a	n/a
Term deposit	7B	-	-	14,959	10,647	1,950	-	-	-	16,909	10,647	5.18	5.12
Shares (not associates)	7B	-	-	-	-	-	-	-	400	-	400	n/a	n/a
Accrued interest	7C	-	-	-	-	-	-	319	-	319	-	n/a	n/a
GST receivable	7C	-	-	-	-	-	-	7	9	7	9	n/a	n/a
Other receivables	7C	-	-	-	-	-	-	609	740	609	740	n/a	n/a
Long term loan	7C	-	-	-	-	729	374	-	-	729	374	5.01	5.01
Total Financial Assets (Recognised)		93	187	14,959	10,647	2,679	374	2,197	1,912	19,928	13,120		
Total Assets										65,602	60,251		
Financial Liabilities (Recognised)													
Trade creditors	9B	-	-	-	-	-	-	1,795	1,151	1,795	1,151	n/a	n/a
Consultancies and grants	9C	-	-	-	-	-	-	4,891	1,315	4,891	1,315	n/a	n/a
Total Financial Liabilities (Recognised)		-	-	-	-	-	-	6,686	2,466	6,686	2,466		
Total Liabilities										12,515	8,192		

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

NOTE 17. FINANCIAL INSTRUMENTS (CONTINUED)

TABLE C Net Fair Values of Financial Assets and Liabilities

		2004		2003	
		Total Carrying Amount	Aggregate Net Fair Value	Total Carrying Amount	Aggregate Net Fair Value
	Note	\$'000	\$'000	\$'000	\$'000
Financial Assets					
Cash at bank	7A	93	93	137	137
Cash on hand	7A	5	5	5	5
Deposits at call	7A	-	-	50	50
Receivables for goods and services	7C	1,237	1,237	755	755
Term deposits	7B	16,909	16,909	10,647	10,647
Shares in listed company	7B	-	-	400	400
Accrued interest	7C	319	319	-	-
GST receivable	7C	7	7	9	9
Other receivables	7C	609	609	740	740
Loans		-	-	374	374
Total Financial Assets		19,179	19,179	13,117	13,117
Financial Liabilities (Recognised)					
Trade creditors	9B	1,795	1,795	1,151	1,151
Consultancies and grants	9C	4,891	4,891	1,315	1,315
Total Financial Liabilities		6,686	6,686	2,466	2,466

Financial Assets

The net fair values of cash, deposits on call and non-interest bearing monetary financial assets approximate their carrying amounts.

The net fair value of term deposits are based on discounted cash flows using current interest rates for assets with similar risk profiles.

Financial Liabilities

The net fair values for trade creditors, capital use charge, and consultancies and grants, which are short term in nature, approximate their carrying amounts.

Credit Risk Exposure

The Institute's maximum exposure to credit risk at the reporting date in relation to each class of recognised financial asset is the carrying amount of those assets as indicated in the Statement of Financial Position.

The Institute has no significant exposure to any concentrations of credit risk. All figures for credit risk referred to do not take into account the value of any collateral or other security.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

	Number	
	2004	2003
NOTE 18. EMPLOYEE EQUIVALENTS		
The number of full-time equivalents employed for the year	158	152

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

NOTE 19. REPORTING OF OUTCOMES

19A Outcome of the Institute

The Institute is structured to meet one outcome -

"Enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources".

Only one Output is identified for the one Outcome.

19B Net Cost of Outcome Delivery

	2004	2003
	\$'000	\$'000
Operating expenses	30,470	27,385
Total expenses	30,470	27,385
Cost recovered from provision of goods and services to the non-government sector		
Goods and services	5,368	5,576
Total cost recovered	5,368	5,576
Other external revenues		
Interest	790	674
Revenue from sale of assets	501	183
Revenue from sale of investments	456	-
Reversal of previous asset write down	-	163
Revenue from related entities	2,142	-
Other	107	318
Total other external revenues	3,996	1,338
Net cost/(contribution) of outcome	21,106	20,471

19C Institute Revenues and Expenses by Outcome

Operating expenses		
Employees	13,232	12,582
Suppliers	10,430	10,015
Depreciation	4,501	4,123
Grants	483	155
Value of assets sold	675	510
Value of investments sold	400	-
Write-down of assets	749	-
Total operating expenses	30,470	27,385
Funded by:		
Revenues from Government	22,134	26,094
Goods and services	5,368	5,576
Interest	790	674
Sale of assets	501	183
Sale of investments	456	-
Reversal of previous assets write off	-	163
Revenue from related entities	2,142	-
Other	107	318
Total operating revenue	31,498	33,008

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2004

Note 20. Appropriations

Particulars	Departmental Outputs		Equity		Total	
	2004	2003	2004	2003	2004	2003
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Year ended 30 June 2004						
Balance carried forward from previous year	-	-	-	-	-	-
Appropriation Acts 1 and 3	22,134	26,094	-	-	22,134	26,094
Appropriation Act 2	-	-	-	3,420	-	3,420
Available for payment of CRF	22,134	26,094	-	3,420	22,134	29,514
Payment made out of CRF	22,112	26,094	-	3,420	22,112	29,514
Balance carried forward to next year	22	-	-	-	22	-
Represented by:						
Appropriations Receivable	22	-	-	-	22	-

This table reports on appropriations made by the Parliament of the Consolidated Revenue Fund (CRF) for payment to the Australian Institute of Marine Science. When received by the Institute, the payments made are legally the money of the Institute and do not represent any balance remaining in the CRF.

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)*for the year ended 30 June 2004***REVENUE COMPARISON**

	2004	2003	2002	2001	2000
	\$'000	\$'000	\$'000	\$'000	\$'000
Non-Government revenue					
External revenue	5,368	5,576	4,707	4,401	4,623
Interest	790	674	629	860	626
Other revenue	158	318	161	179	91
Total Non-Government revenue	6,316	6,568	5,497	5,440	5,340
Appropriations					
Operating	17,841	17,202	16,797	16,788	16,703
Asset replacement	4,293	3,636	2,775	1,148	1,439
Capital and infrastructure	-	3,420	2,811	3,486	2,994
Capital use charge	-	5,256	4,965	4,635	3,817
Total appropriation revenue	22,134	29,514	27,348	26,057	24,953
Other Government revenue					
Revenue related entity	2,142	-	-	-	-
Total Other Government revenue	2,142	-	-	-	-
Total Revenue from Government	24,276	29,514	27,348	26,057	24,953
Total revenue	30,592	36,082	32,845	31,497	30,293
External revenue ratio %	20%	21%	19%	20%	20%

External revenue includes consultancies, grants and contract collaborations.

External revenue ratio is total external revenue in relation to external revenue plus operating and asset replacement appropriations.

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)

for the year ended 30 June 2004

SOURCE OF EXTERNAL EARNINGS BY INDUSTRY

	2004	2003	2002	2001	2000
	\$000	\$000	\$000	\$000	\$000
Australian government	486	278	430	427	458
Australian joint government/industry	2,298	2,065	2,350	1,925	2,200
International governments	765	986	476	744	489
Australian industry	1,173	1,195	1,009	612	895
International industry	528	828	328	155	581
Sale of goods	118	224	114	538	-
	5,368	5,576	4,707	4,401	4,623

COOPERATIVE RESEARCH CENTRE (CRC)

The Institute has agreements with two Cooperative Research Centres, Ecologically Sustainable Development in the Great Barrier Reef (known as CRC Reef Centre) and CRC Aquaculture. Comparison contributions with respective CRCs are:-

	2004	2003	2002	2001	2000
	\$'000	\$'000	\$'000	\$'000	\$'000
AIMS contribution in kind to the two CRCs were					
CRC Reef	3,261	2,881	2,765	2,885	2,147
CRC Aquaculture	-	-	-	141	499
Research income received from CRCs were -					
CRC Reef	2,002	1,458	1,790	1,189	1,090
CRC Aquaculture	-	13	30	74	336

EMPLOYEE STAFF YEARS

	2004	2003	2002	2001	2000
	No.	No.	No.	No.	No.
Science research staff	107.0	98.6	92.8	92.6	98.1
Research services	50.7	53.3	57.6	63.1	61.6
	157.7	151.9	150.4	155.7	159.7

Unaudited

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)
for the year ended 30 June 2004

COST OF OUTPUT BY RESEARCH GROUPS

	Variable	Salaries	Fixed	Overheads	2003-04 Total	2002-03 Total
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
The Coastal Processes Group						
Appropriation	502	1,590	601	2,476	5,169	7,911
External	324	157	378	244	1,103	1,264
	826	1,747	979	2,720	6,272	9,175
The Conservation and Biodiversity Group						
Appropriation	747	3,694	1,410	5,752	11,603	7,612
External	1,124	828	1,097	1,289	4,338	3,487
	1,871	4,522	2,507	7,041	15,941	11,099
The Marine Biotechnology Group						
Appropriation	539	2,122	874	3,305	6,840	5,419
External	448	173	526	270	1,417	1,769
	987	2,295	1,400	3,575	8,257	7,188
Total Summary						
Appropriation	1,788	7,406	2,885	11,533	23,612	20,942
External	1,896	1,158	2,001	1,803	6,858	6,520
Total	3,684	8,564	4,886	13,336	30,470	27,462

Appendices

- Appendix 1 Legislative Foundation and Ministerial Powers
- Appendix 2 Performance Indicators
- Appendix 3 Freedom of Information Statement
- Appendix 4 Science Publications List 2003
- Appendix 5 Membership of External Committees
and Non-government organisations

Appendices

1. *Legislative Foundation and Ministerial Powers*

ENABLING LEGISLATION

The Australian Institute of Marine Science is a Statutory Authority established on 9 June 1972 by the *Australian Institute of Marine Science Act 1972* (AIMS Act).

FUNCTIONS OF INSTITUTE

(1) The functions of the Institute are:

- (a) to carry out research and development in relation to:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and
- (b) to encourage and facilitate the application and use of the results of research and development of that kind; and
- (c) to arrange for carrying out research and development of that kind; and
- (d) to co-operate with other institutions and persons in carrying out research and development of that kind; and
- (e) to provide any other institution or person with facilities for carrying out research and development of that kind; and
- (f) to collect and disseminate information relating to:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and, in particular, to publish reports and other papers; and
- (g) to produce, acquire, provide and sell goods, and to provide services, in connection with:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology; and

- (h) to make available to other persons, on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Institute; and
- (i) to do anything incidental or conducive to the performance of any of the functions in paragraphs (a) to (h).

POWERS OF THE INSTITUTE

Subject to the AIMS Act, the Institute is empowered under Section 10 of the Act to do all things necessary or convenient to be done for, or in connection with, the performance of its functions, including power to:

- (a) Enter into contracts;
- (b) Acquire, hold and dispose of personal property;
 - (ba) to take on hire, or to accept on loan, equipment (including vessels) or other goods needed for the purposes of the Institute;
 - (bb) to lend or to hire out equipment (including vessels) or other goods that are the property of the Institute;
- (c) Purchase or take on lease land or buildings, and to erect buildings, necessary for the purposes of the Institute;
- (d) Dispose of, or grant leases of, land or buildings vested in the Institute;
- (e) Occupy, use and control any land or building owned or held under lease by the Commonwealth and made available for the purposes of the Institute;
- (f) Participate in partnerships, trusts, unincorporated joint ventures and other arrangements for sharing profits;
- (g) Subscribe for and to purchase shares in, and debentures and other securities of, companies;
- (h) Form, and to participate in the formation of, companies; and
- (i) Appoint agents and attorneys, and to act as agents for other persons;
- (j) Accept anything given or transmitted to the Institute whether on trust or otherwise, and to act as trustee of money or other property vested in the Institute on trust;
- (k) Arrange for displaying material and giving lectures, to the public or otherwise, in respect of matters relating to marine science and marine science technology; and the application and use of marine science and marine technology.

MINISTERIAL POWERS OF DIRECTION

Under Section 10 (1) of the *Australian Institute of Marine Science Act 1972*, the Minister has power to direct the Institute in matters of a general or specific nature. These powers pertain particularly to the following:

1. Granting leave of absence to Council members (Section 13, 16(b));
2. Appointing (and terminating such appointment) a person to act as Chairperson (Section 17(1) and (3));
3. Appointing (and terminating such appointment) a person to act as a member of Council (Section 17(2) and (3));
4. Convening a meeting of Council (Section 20(2));
5. Determining terms and conditions of Director's leave of absence (Section 25(2));
6. Approving the Director to undertake paid employment outside the duties of his or her office (Section 29(1) and (2));
7. Appointing a person to act as Director and determining his or her terms and conditions of appointment (Section 30);
8. Approving the Institute to enter into a contract involving the payment of Institute funds of an amount exceeding \$1 million, or higher amount if specified in the regulations (Section 42); and
9. Appointing a Committee to assist Council and approving the terms and conditions of members (Section 45).
10. Under Section 42 of the *Australian Institute of Marine Science Act 1972*, the Finance Minister has power to:
11. Out of money appropriated by the Parliament for the purpose, lend money to the Institute (Section 42A);
12. Provide written approval for the Institute to borrow money from persons other than the Commonwealth (Section 42B); and
13. Guarantee borrowings of the Institute (Section 42C).

2. *Performance Indicators*

The performance management framework at AIMS is established by the indicators agreed between AIMS and the Ministers for Science and Finance in the Triennium Funding Agreement (tabulated below), the Outcome-Output Structure described in the Portfolio Budget Statement (see p. 41) and performance goals set by Council each year. Research implementation plans identify key review points where changes in resource allocation may occur.

Ongoing programs of evaluation at AIMS include:

- The assessment and reporting of performance against performance indicators;
- The regular submission of research findings to external review by scientific peers;
- The critical assessment of patent applications; and,
- The annual staff performance review cycle.

	Goal	Indicator
Research and development	To maintain and encourage the highest level of research (both at national and international levels) that will meet the future needs of industry and other users, and ensure the effective and efficient use of resources to conduct that research	<ul style="list-style-type: none"> ■ Shift of resources to agreed priority areas. ■ Scientific publications: <ul style="list-style-type: none"> ■ Publication level measured by number and categorised by types of publication. ■ Retrospective citation analysis using Science Citation index (five yearly). ■ Number of patents held reported by the number of separate technologies. ■ Other examples: distinguished awards, major prizes, and nomination as host agency by internationally recognised researchers.
Liaison and collaboration	To encourage the transfer of research output through liaison and collaboration with industry, government and other users (including scientific and general communities)	<ul style="list-style-type: none"> ■ Contribution to Australia's research future through teaching and training: <ul style="list-style-type: none"> ■ Number of postgraduate students supervised by AIMS. ■ Number of conjoint teaching positions undertaken with universities. ■ Coordination of research and linkages with decision-making bodies: <ul style="list-style-type: none"> ■ Number of collaborations. ■ Input to policy-making and provision of advice.
Technology transfer and commercialisation	To encourage and facilitate the application of knowledge and technology developed by the agency and by industry and other users, for the maximum long-term benefit to Australia	<ul style="list-style-type: none"> ■ External earnings for research services, consistent with the Institute's mission. ■ Adoption by users of practices, instruments and processes developed by AIMS. ■ Joint ventures and strategic alliances. ■ Spin-off businesses.
Customer satisfaction	To ensure a high level of customer satisfaction	<ul style="list-style-type: none"> ■ Contracts successfully completed

3. *Freedom of Information Statement*

The *Freedom of Information Act 1982* (FOI Act) requires each Australian Government agency to publish a statement setting out its role, structure and functions, the documents available for public inspection, and access to such documents. Section 8 of the FOI Act requires each agency to publish information on the way it is organised, its powers, decisions made and arrangements for public involvement in its work.

This statement, in conjunction with information contained in this annual report, is intended to meet the requirements of Section 8 of the FOI Act.

ROLE, STRUCTURE AND FUNCTIONS

The Institute's role, structure and functions are described at pages 57, 60 and 119 of this Annual Report.

DOCUMENTS AVAILABLE FOR INSPECTION

Copies of the Institute's publications and reports available on request are listed below. With the exception of final project reports, they are generally free of charge. Other information may be available, subject to assessment on the grounds of, for example, commercial confidentiality or personal privacy.

Facilities for reviewing documents are provided at AIMS. The Institute's publications are on display for the public and may be purchased through the AIMS Bookshop.

General inquiries concerning access to documents, or other matters relating to FOI, should be directed to:

Human Resources Manager
 Australian Institute of Marine Science
 PMB No 3, Townsville Mail Centre MC Qld 4810
 Telephone: (07) 4753 4319
 Facsimile: (07) 4772 5852

Strategic Directions	Files, publications*
Research Plan	Files, publications*
Annual Operational Plan	Files, unpublished documents
Project details	Databases, files
Final project reports	Publications
Non-technical summaries of final project reports	Publications*
R&D funding applications	Files, Annual Report file, publications*
Administration	Files, unpublished documents
Mailing lists	Databases

* These documents are also available on the Institute's website (www.aims.gov.au).

4. Science Publications 2003

JOURNALS

- Alibert C, Kinsley L, Fallon SJ, McCulloch MT, Berkelmans R, McAllister F (2003) Source of trace element variability in Great Barrier Reef corals affected by the Burdekin flood plumes. *Geochimica et Cosmochimica Acta* 67: 231-246.
- Alongi D, Clough BF, Dixon P, Tirendi F (2003) Nutrient partitioning and storage in arid-zone forests of the mangroves *Rhizophora stylosa* and *Avicennia marina*. *Trees* 17: 51-60.
- Alongi D, Chong VC, Dixon P, Sasekumar A, Tirendi F (2003) The influence of fish cage aquaculture on pelagic carbon flow and water chemistry in tidally dominated mangrove estuaries of Peninsular Malaysia. *Marine Environmental Research* 55: 313-333.
- Barnes DJ, Taylor RB, Lough JM (2003) Measurement of luminescence in coral skeletons. *Journal of Experimental Marine Biology and Ecology* 295: 91-106.
- Benzie JAH, Smith C, Sugama K (2003) Mitochondrial DNA reveals genetic differentiation between Australian and Indonesian pearl oyster *Pinctada maxima* (Jameson 1901) populations. *Journal of Shellfish Research* 22: 781-787.
- Brinkworth CS, Carver JA, Wegener KL, Doyle J, Llewellyn LE, Bowie JH (2003) The solution structure of frenatin 3, an nNOS inhibitor from the giant tree frog *Litoria infrafrenata*. *Biopolymers* 70: 424-434.
- Brunskill GJ, Zagorskis I, Pfitzner J (2003) Geochemical mass balance for lithium, boron, and strontium in the Gulf of Papua, Papua New Guinea (Project TROPICS). *Geochimica et Cosmochimica Acta* 67: 3365-3383.
- Burford M, Costanzo SD, Dennison WC, Jackson CJ, Jones AB, McKinnon AD, Preston N, Trott LA (2003) A synthesis of dominant ecological processes in intensive shrimp ponds and adjacent coastal environments in NE Australia. *Marine Pollution Bulletin* 46:1456-1469.

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5. *Membership of External Committees and Non-government Organisations*

INTERNATIONAL FORA

Arafura Timor Seas Expert Forum (ATSEF) – Steering Committee
 Convention on Biological Diversity's Panel of Experts on Access and Benefit Sharing
 Coral Reef Degradation in the Indian Ocean (CORDIO) Project, Steering Committee
 Coral Reef Research Advisory Committee, RIS Japan
 Diversitas – Scientific Steering Committee
 Global International Waters Assessment (GIWA) - Advisory Committee
 Great Barrier Reef Research Foundation – International Scientific Advisory Committee
 (GBRRF – ISAC)
 IGBP Continental Margin Task Team (JGOFS, LOICZ)
 International Atomic Energy Agency (Expert Consultant to United Nations Development
 Project 'Transfer of Receptor Binding Assay for Harmful Algal Toxins')
 International Coral Reef Initiative - Co-ordination and Planning Committee
 International Coral Reef Action Network – Steering Committee
 International Ocean Institute (Australia) Coordination Centre for Asia Pacific
 International Society for Reef Studies
 MARGINS Oceanographic Consortium
 Palau International Coral Reef Centre Scientific Advisory Committee
 Stratos/IISD/Swiss Government's Access and Benefit Sharing Tool Project Advisory Committee
 Tropical River-Ocean Processes in the Coastal Settings (TROPICS)
 UNESCO International Hydrological Program: Estuarine Ecohydrology subproject
 World Bank Coral Reef Restoration and Remediation Working Group

DOMESTIC FORA

Australian Marine Sciences Association (NT)
 Australian Marine Sciences Association
 Australian Academy of Technological Sciences and Engineering
 (CAETS 2005: Organising Committee):
 Australian Census of Marine Life National Steering Committee
 Australian National Sportfishing Association (ANSA), Scientific Research Foundation
 Australian Ocean Colour Working Group
 Australian Research Council – Expert Review Committee
 Burdekin River Water Allocation Management Plan Technical Advisory Panel (TAP)
 Charles Darwin University, School of Science, Visiting Committee
 Cleveland Bay Consortium
 Commonwealth Inter-departmental Committee on Access to Genetic Resources
 Commonwealth Marine Protected Areas Committee
 CRC Reef Board
 CRC Reef Scientific Advisory Committee
 CRC Reef Task Review Committee
 Darwin Harbour Advisory Committee
 Dampier Archipelago/Cape Preston Advisory Committee
 FRDC Prawn Domestication Steering Committee
 GBR Reef Protection Inter-Departmental Committee - Expert Scientific Committee
 GBRMPA Fisheries Research Advisory Committee
 GBRMPA Water Quality and Coastal Research Advisory Committee
 Milner Bay Marine Environmental Advisory Group
 National Centre for Tropical Wetlands Management
 National Facilities - Ship Scientific Advisory Committee
 National Oceans Office – National Bioregionalisation Working Group
 National Low Level Nutrient Collaborative Trial Committee
 Oceans Policy Science Advisory Group
 QDNRM Water Allocation Management Plan, Technical Advisory Panel
 Queensland Department of Primary Industries and Fisheries – HarvestMac
 Queensland Department of Primary Industries and Fisheries – ReefMac
 Regional Consultative Group for the Wet Tropics Region Coastal Management Plan
 Standards Australia Committee EV-008 – Examination of waters
 Torres Strait Fisheries Research Advisory Committee
 Twin Cities Fish Stocking Society
 WA Department of Environmental Protection - NW Shelf Environmental Management Project
 (Technical Advisory Committee)
 WA Department of Environmental Protection-CSIRO Marine,
 NWS JEMS Technical Advisory Committee
 WA Marine Parks and Reserves Scientific Advisory Committee
 WA Physical Oceanographic Coordinating Group (WAPOCG)
 Western Rock Lobster Fishery Effects of Fishing on the Ecosystem – Scientific Reference Group

Glossary

ACRONYMS AND ABBREVIATIONS

AIMS	Australian Institute of Marine Science
AIMS Act	<i>Australian Institute of Marine Science Act 1972</i>
ANU	Australian National University
ANZECC	Australian and New Zealand Environment and Conservation Council
APEC	Asia-Pacific Economic Cooperation
APRA	Australian Prudential Regulation Authority
ATRF	Arafura-Timor Research Facility
CAC Act	<i>Commonwealth Authorities and Companies Act 1997</i>
CALM	Western Australian Department of Conservation and Land Management
CBPL	Cleveland Biosensors Pty Ltd
COTS	Crown-of-thorns Starfish
CRC	Cooperative Research Centre
CRC Reef	Cooperative Research Centre for the Great Barrier Reef World Heritage Area
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Australian Government Department of Agriculture, Fisheries and Forestry
DEH	Australian Government Department of the Environment and Heritage
DIPE	Northern Territory Department of Infrastructure, Planning and Environment
EAP	Employee Assistance Program
EASNQ	Employee Assistance Services of North Queensland
EEO	Equal Employment Opportunity
EMP	Environment Management Plan

FOI	Freedom of Information
FRDC	Fisheries Research and Development Corporation
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GCRMN	Global Coral Reef Monitoring Network
GIWA	Global International Waters Assessment
HOME	Hydrology, Oceanography, Meteorology and Ecology model
ILC	Indigenous Land Council
IMPAC	International Marine Project Activities Centre
IP	Intellectual property
ISRS	International Society for Reef Studies
JCU	James Cook University
MPA	Marine Protected Area
NCI	United States National Cancer Institute
NGO	Non-Governmental Organisation
NLC	Northern Lands Council
NOAA	United States National Oceanic and Atmospheric Administration
NRP	National Research Priorities
OGTR	Office of the Gene Technology Regulator
OH&S	Occupational health and safety
OH&S Act	<i>Occupational Health and Safety (Commonwealth Employment) Act 1991</i>
PAHs	Polycyclic aromatic hydrocarbons
PPDK	pyruvate Pi dikinase (an enzyme found in weeds)
QEPA	Queensland Environmental Protection Agency
QDNRM	Queensland Department of Natural Resources and Mines
QDPIF	Queensland Department of Primary Industries and Fisheries
Rainforest CRC	Cooperative Research Centre for Tropical Rainforest Ecology and Management
R&D	Research and development
SPMDs	Semi-permeable membrane devices
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UQ	University of Queensland
UV	Ultra-violet
UWA	University of Western Australia
WTWHA	Wet Tropics World Heritage Area

TERMS

Archaeal – a member of the Archaea, a domain of prokaryotic micro-organisms.

Bacterioplankton – planktonic bacteria.

Benthic – located on the bottom of a body of water or in the bottom sediments, or pertaining to bottom-dwelling organisms

Bio-active – biochemical isolated from an organism with useful activity (eg. Anti-tumour, anti-viral or herbicidal activity).

Biochemicals – chemicals that are either naturally occurring or identical to naturally occurring substances.

Biocides – chemical agents with the capacity to kill biological life forms.

Bio-indicators – biological indicators that can be used to assess environmental quality or physiological stress.

Bio-innovation – innovative biotechnologies

Bio-oils – lubricants made from plant materials such as rape seed. They are more biodegradable and cause less harm to the environment than traditional mineral oils.

Biosensors – any organism, microorganism, enzyme system or other biological structure used for measurement or identification or as an indicator.

Carbon budget – a balance sheet of carbon in an area or a system. Normally a carbon budget will include rates of various inputs and outputs of carbon, as well as information on the relative abundance of various forms of carbon.

Coastal shelf – the marine zone adjacent to the land that is subject to land processes, most commonly rivers and their runoff.

Cyanobacterial – relating to or caused by photosynthetic bacteria of the class Cyanobacteria

Ecohydrology – an environmental problem-solving concept which is based upon the assumption that sustainable development of water resources is dependent on the ability to maintain evolutionarily established processes of water and nutrient circulation and energy flows at the basin scale.

Epidemiological methods – methods of dealing with the scientific study of the incidence, control, and spread of disease in a population.

Eukaryotic – belonging to the large group of organisms that have nuclei enclosed by a membrane within their cells.

Hydrodynamic – macrobenthic – Benthic animals larger than 1.0mm.

Microbes – minute living organisms, usually one-celled organisms, which include bacteria, protozoa, and fungi.

Mitochondria – the principal energy source of the cell. Mitochondria convert nutrients into energy as well as doing many other specialized tasks.

Pelagic – of the open sea; not associated with the ocean bottom.

Scleractinian – a member of the order Scleractinia, distinguished by

Sedimentation – the deposition or settling of soil particles suspended in water.

Substrate – the material making up the base upon which an organism lives or to which it is attached

Zooxanthellae – tiny plants that live in a symbiotic relationship with certain corals, clams, and some sponges. They receive nutrients from their host and provide a food source in return. It is the zooxanthellae that are responsible for the brilliant green, yellow, and blue colors in corals and clams.

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