Australian Institute of Marine Science **2001-2002** Annual Report

AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

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

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ABOUT THIS REPORT

This Annual Report informs the Parliament, industry, other stakeholders, educational and research institutions, the media and the Australian community about the performance of the Australian Institute of Marine Science. In line with expectations of Government, it is a key reference document and a document for internal management.[1] It forms part of the historical record, and tells the story of a year of rejuvenation and positive change at AIMS. The Report covers the period from 1 July 2001 to 30 June 2002, the second year in the Institute's Research Plan 2000-2003. It describes progress towards objectives and planned outcomes listed in the Research Plan, highlighting science achievements that address national and international R&D priorities and the needs of customers. The Institute recognises that knowledge drives prosperity and that AIMS has an important role in generating knowledge products and services, as well as ensuring the sustainability of marine resources. An overview of operational performance is provided within an accrual-based outcomes and outputs framework, our ultimate agreed outcome being "enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources". In accordance with the current triennial funding agreement between the Institute and the Government, the Report gives details of performance against effectiveness indicators such as research and development, liaison and collaboration, technology transfer and commercialisation, and customer satisfaction. Finally, this report complies with requirements for authorities under the *Commonwealth Authorities and Companies Act* 1997, the *Commonwealth Authorities and Companies (Report of Operations) Orders* 2002 and the *Commonwealth Authorities and Companies (Financial Statements 2001-02) Orders.* Items required for departmental annual reports have been included where appropriate.

The *AIMS Annual Report 2001-2002* has been produced by the Institute's Science Communication Section. If you would like more copies, please contact the Manager on 07 4753 4250, email marketing@aims.gov.au, or write to the address on the back cover. The Report is also available on-line at **www.aims.gov.au**

[1] Department of the Prime Minister & Cabinet, *Requirements for Annual Reports,* June 2001

AUSTRALIAN INSTITUTE OF MARINE SCIENCE

Townsville • Darwin • Perth

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

9 September 2002

Dear Minister

On behalf of the Council of the Australian Institute of Marine Science, we have pleasure in presenting the Institute's 30th annual report for the year ended 30 June 2002. The report is forwarded in accordance with Section 9 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act).

This report provides information so that you, the Parliament, and users of the Institute's research output can make an informed judgement about AIMS' performance during the 2001-2002 financial year.

The report has been prepared in accordance with the *Commonwealth Authorities and Companies (Report of Operations) Orders 2002* and the *Commonwealth Authorities and Companies (Financial Statements 2001-2002) Orders.* The Council endorsed the content of the annual report by a resolution of its meeting of 9 September 2002.

Yours sincerely

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

Professor Stephen Hall
Director
Australian Institute of Marine Science

HIGHLIGHTS

- New coral bleaching response strategy delivered most comprehensive survey ever of coral bleaching, showing nearly 60% of reef areas in Great Barrier Reef Marine Park affected over the summer months of early 2002.
- AIMS researchers contributed to UNESCO initiative to have Banda Islands – Indonesia's Spice Islands – listed as a World Heritage site. AIMS team were first in characterising the island's rich coral communities largely intact.
- Fifteen years of AIMS data on river runoff formed basis of the Great Barrier Reef Marine Park Authority's *Water Quality Control Plan*, setting targets for reductions in enhanced runoff of sediments and nutrients.
- Cost-effective aquaculture technologies were introduced in Vietnam's Mekong Delta, causing survival of black tiger shrimps to jump from 5 per cent to 40 per cent, boosting harvests and farm income.
- Natural hydrocarbon seeps in Timor Sea and their relationship to biodiversity and *Halimeda* seaweed mounds prompted new research illuminating knowledge of ecological processes and potential impacts of oil and gas exploration.
- WA team, supported by industry, pioneered use of deep-sea video tools off North West Shelf to observe marine life on the seafloor at depths to 900 metres.
- Antarctica New Zealand funded research into human impacts on Antarctic sponges and their potential to assess the health of polar regions.
- Increased interpretive research was conducted into the response and adaptation of coral reefs to global climate change.
- AIMS' external earnings increased to $4.7 million, arresting a trend of declining external earnings. Income from contracted research rose 19%.
- Spin-off company ToxiTech Pty Ltd was incorporated and attracted private and public investment funds. It offers exciting prospects for new jobs and economic activity in regional Australia.
- Discoveries of novel herbicide advanced to glasshouse testing stage, achieving a milestone in the transfer of intellectual property to industry.
- The Institute's infrastructure refurbishment program on time and under budget, with $12.5 million being spent on construction of new wing and revamp of laboratories and offices.
- New bases established in Darwin and Fremantle, to supplement research undertaken at Cape Ferguson laboratories, in northern Queensland.
- Organisational Improvement Plan in full swing, with emphasis on workplace culture, business planning, and people/business systems delivering immediate gains.

CONTENTS

REPORT OF OPERATIONS

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 Report of Operations by a resolution of its meeting of 9 September 2002.

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

Professor Stephen Hall
Director
Australian Institute of Marine Science

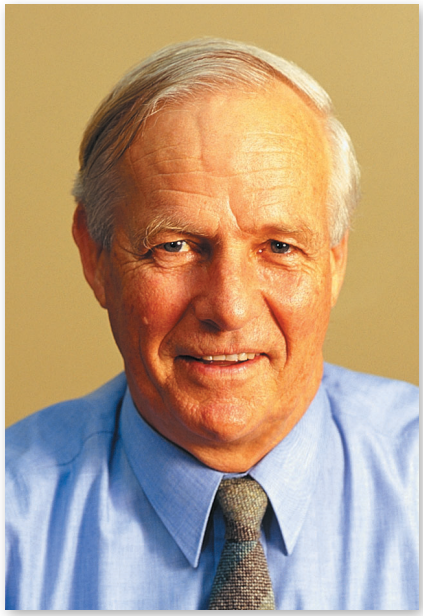
CHAIRMAN'S YEAR IN REVIEW

'The Institute worked to provide an integrative strategy for the ecologically sustainable use of marine natural resources.'

Norbury Rogers A.O.

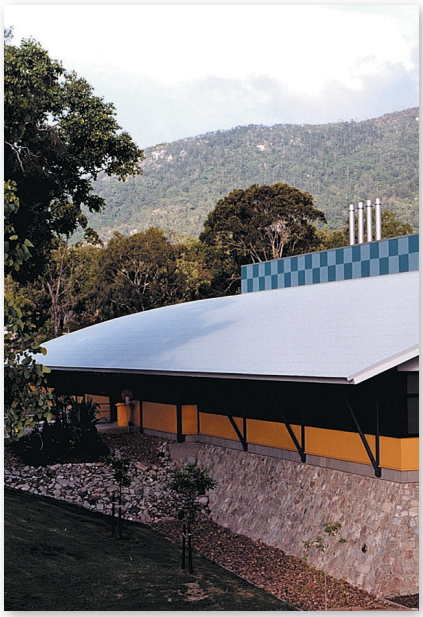
In 2001-2002, the Australian Institute of Marine Science continued its record of achievement, supported by the Commonwealth Government's framework for wise and beneficial use of Australia's Marine Jurisdiction. This policy framework is fundamental to Australia's national interest, given that our Marine Jurisdiction encompasses more seafloor than the country's entire land mass.

In particular, the Institute worked to provide an integrative strategy for the ecologically sustainable use of marine natural resources as detailed in Australia's Oceans Policy (1998), Australia's Marine Science and Technology Plan (1999), and more recently in the Review of Marine Research in Tropical Australia by Chief Scientist Dr Robin Battterham (final report published July 2001). In this effort, the Institute upheld the vision of "healthy oceans: cared for, understood and used wisely for the benefit of all, now and in the future".[2] It was pleasing to see Dr Batterham conclude in his Review that the Institute's main base at Cape Ferguson, near Townsville in northern Queensland, was comprehensive and 'ideal for marine research'. Furthermore, he noted that 'there is none better in the region'. One of his recommendations was that the Cape Ferguson site be considered for the further co-location of marine research capability and small marine R&D-intensive industry.



NORBURY ROGERS A.O.

[2] See 'A Vision for Australia's Oceans' in Australia's Marine Science and Technology Plan, *An Overview,* 1999, p.4



THE NEW BIOTECHNOLOGY WING

As Council chairman, I was also pleased to see that, in reviewing research output and collaboration, the Chief Scientist found the Townsville model of collaborative marine research "dynamic" and described the networks and relationships operating between AIMS, James Cook University, the Great Barrier Reef Marine Park Authority, CRC Reef and Queensland Government organisations as a 'virtual Centre of Excellence'. Dr Batterham said bibliometric reports of AIMS research output "showed a degree of excellence that would be expected only of research organisations of world standing".[3]

As well as doing contracted research, publishing science articles and books, and transferring technology through patents and licenses, AIMS scientists across all groups constantly advise and engage with industry bodies, environmental agencies, schools and community groups, as well as their scientific peers. Institute scientists believe knowledge transfer is as important as the discovery itself. In 2001-02, AIMS staff gave about 170 formal presentations and many more informal ones. Science publications increased from 125 to 142, and media coverage of AIMS research doubled. Altogether, this represents a substantial increase in science transfer and community outreach over the previous reporting year.

COMMERCIALISATION OF RESEARCH

The Institute achieved $4.7 million in external earnings in 2001-02, nearly $300,000 more than it earned in 2000-01. This puts the Institute close to the target set for external earnings by the Commonwealth (20% of total revenue). Of particular interest is the 19% increase in earnings from contracted research. Given our earlier projections, and the disruption caused by the biggest refurbishment program in the Institute's history, I congratulate AIMS scientists on achieving this result.

AIMS also fulfilled many of the policy objectives of the Government's $3 billion Innovation Statement, *Backing Australia's Ability*, in 2001-02. This five-year plan recognises that commercialisation of Australian research is crucial to national prosperity. The commercialisation of AIMS research is now a higher priority than it has ever been in the organisation's history. The incorporation of the spin-off company, ToxiTech Pty Ltd, in collaboration with James Cook University, and its attraction of funding from the Commonwealth Biotechnology Innovation Fund, Queensland's Innovation Start-up

[3] Review of Marine Research in Tropical Australia, July 2001, pp. 13-15.

Scheme and private investors, was an important shift in how AIMS can transfer its technology. This spin-off approach provides for more participation in the development of products of research, and greater return to AIMS in the long term.

The AIMS Council also commissioned an independent review in November 2001 of the Institute's approach to knowledge generation and the commercialisation of its discoveries. The Council considered this report at its Darwin meeting on June 26 and the implementation of many of the recommendations is now underway.

REFURBISHMENT HERALDS NEW ERA

The Chief Scientist's Review of Marine Research in Tropical Australia (officially reporting in July 2001, with conclusions and recommendations foreshadowed in the interim report of April 2000) resulted in the most significant refurbishment experienced by AIMS in nearly a quarter of a century. In the Review, Dr Batterham said the restoration to full operational capability and the ongoing maintenance of Australia's marine research infrastructure should be a high priority. The Government provided $17.1 million for the refurbishment of the Cape Ferguson laboratories, a new research vessel and general repairs. Senator the Hon. Nick Minchin, then Minister for Industry, Science and Resources, opened the new South Wing at the Cape Ferguson site on 6 November 2001. This was a celebratory moment for Council members as well as Institute staff. I think the fresh contemporary design of the new South Wing signals to everyone that AIMS is an exciting place to be.

The new building means that, for the first time, all AIMS staff specialising in marine biotechnology areas – including tropical aquaculture, bioactive molecule discovery, genetics research, and environmental biochemistry and chemical ecology – are together in the same allocated space. As expected, moving laboratories and experiments was a major logistical challenge. But the South Wing has already enhanced the Institute's research capability, with the Marine Biotechnology Group showing the way in meeting objectives set in the Institute's 2000-03 Research Plan. Phase 2 of the Infrastructure Refurbishment Program, now underway, includes the complete refurbishment of existing offices and laboratories and a major revamp of the Institute's library. This is due for completion in November 2002.

SUCCESS OF DARWIN WIN

Dr Batterham's report identified Australia's northern region as increasingly important to marine researchers. Last June, the AIMS Council made a strategic decision to focus more of the Institute's research in the "Top End". AIMS and the Australian National University were successful in gaining funding of $3.25 million under the Commonwealth's Major National Research Facilities Program for a Darwin-based research facility. Planning for this facility began in earnest in 2001-02 and the Arafura-Timor Research Facility is scheduled for completion in late 2003. Its mission will be to "facilitate the strategic commercialisation, sustainable management and appropriate conservation of the marine and coastal ecosystems of the Arafura and Timor Seas, for Australia and for our regional neighbours".

In the meantime, AIMS' scientists have begun research in the region and the Institute's newest research vessel, the *RV Cape Ferguson*, worked for many months of 2001-02 in the coastal waters across the top of Australia. It has supported work on seabed ecology, physical oceanography, microbiology and geochemistry at Northwest Cape (WA) and the Sahul Shoals region of the Timor Sea, and also supported work on sediment dynamics in the Ord River Estuary and Cambridge Gulf.

NEW BASE IN FREMANTLE

To further support the Institute's research activity in the West, AIMS also established a new base in Fremantle, Western Australia during 2001-02. Over the next five years, AIMS will use the WA base to build on scientific expertise in early life histories of corals as well as surveys of tropical marine ecosystems. AIMS WA will address major gaps in knowledge of the submerged reefs in the North West of Australia of which we know very little. AIMS WA is developing new technologies for reef rehabilitation and surveys of the deep ocean floor. Much of this research has resulted from co-investment with the petroleum industry and marine management agencies.

YEAR AHEAD

Both the new WA base and the success of our joint bid with the Australian National University for funding to build the Arafura Timor Research Facility (ATRF) in Darwin mark a significant commitment by AIMS to extending the level of research support we provide to northern and western Australia. This will be a major challenge for the Institute in the coming year. Building on the positive momentum created by organisational change and the refurbishment of the Institute's main base at Cape Ferguson will also attract our energy.

DIRECTOR'S REPORT

'A noteworthy event was the restructure of the Institute's science base into three Research Groups, across which interdisciplinary research projects are conducted.'

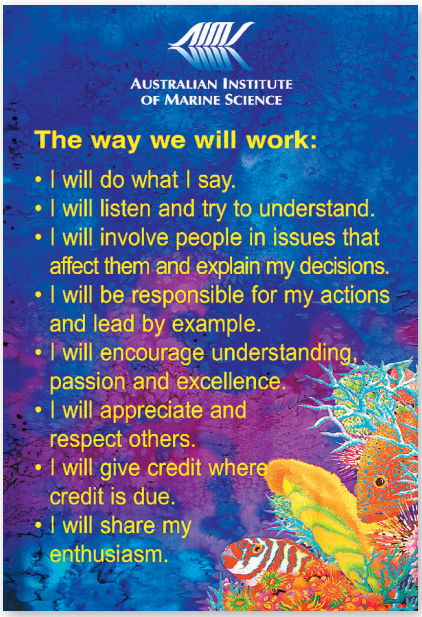
Professor Stephen Hall

This has been a challenging year for the Institute with a substantial program of change, both physical and cultural. The most notable physical change has been the construction and opening of the South Wing at the Cape Ferguson complex, to support activities in marine biotechnology, and the refurbishment of our main building, built in the 1970s. That we have managed to maintain the level of science output that one would expect for the middle year of our triennium, while living through the inevitable disruption that $12.5 million in construction brings, is a testament to the dedication and flexibility of AIMS staff. I am pleased to note that the refurbishment program has stayed on time and under budget throughout. We look forward to its completion in November 2002.

PROFESSOR STEPHEN HALL

THE WAY WE WORK

The Institute has also embarked on a substantial program of organisational



'WAY WE WILL WORK' CARD

improvement, informed in part by the results of a Culture Benchmarking Survey conducted in August 2001, for which we obtained a 98% return rate. The survey identified aspects of both our business and people systems that need attention and we have now prioritised a program of organisational improvement based on this and other information. A particular focus for 2001-02 was improving how we treat each other and work together. Noteworthy among these efforts was the development by a cross-functional staff team of a set of Way We Will Work principles (see above), which we are now using to guide our behaviour towards one another. To further address this important issue we have also increased the number and training of Workplace Harassment Contact Officers and have provided all staff with a greater awareness of workplace harassment issues. Almost all staff completed a three-hour awareness program by year's end.

SCIENCE RESTRUCTURE

While no significant events occurred that were required to be reported to the Minister, a noteworthy corporate event in 2001-02 was the restructure of the Institute's science base into three Research Groups, across which interdisciplinary research projects are conducted. The Research Group is now the fundamental unit for science strategy development, marketing, relationship management, co-ordination of science delivery and reporting by research projects. The Research Groups, Conservation and Biodiversity, Coastal Processes, and Marine Biotechnology were chosen to reflect core competencies (the "chosen fields" of our Vision). This choice also allows for a more empowered workforce where, guided by the strategic objectives set for the organisation as a whole, scientists can effectively develop strategy for their discipline area and develop inter-disciplinary synergy with others. We have already seen the benefits of this restructure with an increased focus on individual stakeholder consultation as part of the strategic planning process for the next triennium.

FUTURE PROSPECTS

Recently the Australian Science Capability Review, *The Chance to Change* (2000) and the Review of Marine Research in Tropical Australia (2001) have provided additional input to our thinking on the Institute's future. *The Chance to Change* and its implementation through *Backing Australia's Ability* recognises that innovation is the key driver of a modern economy and makes clear how expectations on

Commonwealth science agencies are changing. A key objective for AIMS must be new business and wealth creation. Our challenge is to balance this imperative with the continuing need to provide the underpinning knowledge to ensure the ecological sustainability of our seas and coasts.

Progress in achieving this balance is encouraging. For example, the large-scale assessment of coral bleaching on the Great Barrier Reef and investigation of its causes has provided important input into policy debate. Fifteen years of AIMS data on the enhanced runoff of sediments and nutrients into the Great Barrier Reef now forms the basis of the management authority's Water Quality Control Plan. We have also, in partnership with James Cook University, created the spin-off company ToxiTech Pty Ltd, which offers exciting prospects for new jobs and economic activity in regional Australia.

Notwithstanding such successes, with excellence and relevance as the essential priorities, considerable improvements are possible and necessary to maintain our position as a successful modern public-sector research institution. An independent review of the Institute's approach to knowledge generation and the commercialisation of its discoveries, which was commissioned by the AIMS Council in November 2001, has provided valuable input as we consider how to improve the Institute's performance and best organise ourselves to deliver value to our stakeholders.

DEVELOPMENTS SINCE JUNE 30

Our initial focus for 2002-03 is occupational health and safety, managing people and performance, strategic planning and improving business systems. Organisational improvement continues to be driven by volunteer teams who scope each issue and implement workable solutions. The Comcare OHS action plan was implemented in July-August, and the Institute's Key Performance Goals operationalised. New financial reporting software was also trialled and will make managing budgets easier. In addition, the relationship between the Executive Team and the Senior Management Group changed, with the SMG now the primary decision-making body for normal strategic and operational matters of the Institute. It meets monthly. Decisions relating to significant policy shifts or personnel and commercial issues will continue to be made by the Executive Team.

Another noteworthy development this year is the appointment of Dr Ian Gould to the AIMS Council, following the departure of Bruce McKay. Ian has over 25 years experience in the mining industry and is currently Deputy Chairman of Western Metals and Chairman of the South Australian Resources Industry Development Board. His five-year appointment to the AIMS Council will be invaluable to us, given his experience in management and his familiarity with environmental issues. The appointment was publicly welcomed by the Minister for Science, the Hon Peter McGauran MP in a press statement, where he pointed out that Dr Gould's industry experience would assist AIMS as it collaborates with stakeholders throughout Australia to better meet their research requirements.

OPERATIONAL PERFORMANCE

MEASURING PERFORMANCE

In 1999-2000 the Federal Government shifted to an accrual-based, outcomes and outputs framework. This second half of the Annual Report provides an overview of operational performance in 2001-02 linking our agreed output, "research products and services for users of marine resources", to our agreed final outcome, "enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources". Further, we report on science and technology generated by the Institute against performance measures and effectiveness indicators that gauge the quality and quantity of output.

Performance information for AIMS is included in the Portfolio Budget Statement and in the 2000-03 Triennium Resource Agreement signed between AIMS and the Government. The Institute's outcome is derived from the official functions of the Institute (AIMS Act, Section 9), with effectiveness indicators reflecting the relevance of AIMS' products and services to Government policy and its effort to encourage innovation (see *Backing Australia's Ability).* The Institute's outcome underwrites the sustainability initiative of Government, captures benefit from Australia's marine resources and meets community expectations.

Government support for marine R&D is based on recognition of the importance of research to national prosperity and, in particular, the need to encourage ecologically sustainable development of marine industries, including new industries such as aquaculture and fine chemicals. In line with national R&D priorities, the Institute has established five strategic directions:

- deriving benefits from marine biotechnology;
- exploring and conserving marine biodiversity;
- measuring human impacts in coastal marine ecosystems;
- predicting climate impacts upon marine ecosystems; and
- sustaining coral reef ecosystems.

Within the three Research Groups – Conservation and Biodiversity, Coastal Processes, and Marine Biotechnology – an interdisciplinary approach is taken which creates synergies through collaborative research to provide new ideas and production efficiencies. This research environment means the Institute's 18 projects can address several strategic directions at once. The research program has developed from consultation with stakeholders and clients, including industries such as agriculture, aquaculture, fisheries, mining, petroleum and tourism; the educational sector; other research agencies; marine resource managers; government and the Australian community. In addition, the research

program is now underpinned by the Institute's Key Performance Goals, approved by Council. A breakdown of current research at AIMS is available at: http://www.aims.gov.au/pages/research.html

Performance indicators in the 2000-03 Triennium Resource Agreement are grouped into areas that reflect major objectives of government-funded research and development. Our progress towards these objectives is a measure of the effectiveness of AIMS activities during the reporting period. Below are the broad objectives, along with the measures of effectiveness agreed with the Government.

I. 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.

INDICATORS

1. Shift of resources to agreed priority areas.
2. Scientific publications:
   a. Publication level measured by number and categorised by types of publication.
   b. Retrospective citation analysis using Science Citation index (five yearly).
   c. Number of patents held reported by the number of separate technologies.
3. Other examples: distinguished awards, major prizes, and nomination as host agency by internationally recognised researchers.

II. 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).

INDICATORS

4. Contribution to Australia's research future through teaching and training:
   a. Number of postgraduate students supervised by AIMS.
   b. Number of conjoint teaching positions undertaken with universities.
5. Coordination of research and linkages with decision-making bodies:
   a. Number of collaborations.
   b. Input to policy-making and provision of advice.

III. 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.

INDICATORS

6. External earnings for research services, consistent with the Institute's mission.
7. Adoption by Users of Practices, Instruments and Processes Developed by AIMS.
8. Joint ventures and strategic alliances.
9. Spin-off businesses.

IV. CUSTOMER SATISFACTION

To ensure a high level of customer satisfaction.

INDICATORS

10. Contracts successfully completed.

RESEARCH OUTPUT AND COMMUNITY OUTCOMES

'Bibliometric reports of research outputs showed a degree of excellence that would be expected only of research organisations of world standing.'

Dr Robin Batterham

Australia's Marine Jurisdiction provides a unique platform to grow our international presence in science and technology, within an increasingly competitive economic environment. AIMS recognises the nature of competition has fundamentally changed and, through consultation with Government, industry, other stakeholders, educational and research institutions and the Australian community, it adjusts research priorities and remains alert on a global basis to new opportunities and emerging technologies. Projects are constantly reviewed to ensure they deliver the community outcomes and research output flagged in the three-year Research Plan which forms part of our triennium funding agreement with the Government. The cycle of science planning, reporting, review and adjustment underwrites the outcome of enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources.

This section of the Annual Report gives an account of the Institute's science achievements against performance information and effectiveness indicators provided in the 2000-03 Triennium Resource Agreement and the portfolio budget statements. For more detail on research output within the three research groups at AIMS – Conservation and Biodiversity, Coastal Processes, and Marine Biotechnology – turn to the *Science Reports.* Similarly, corporate clients should consult *Business Development.*

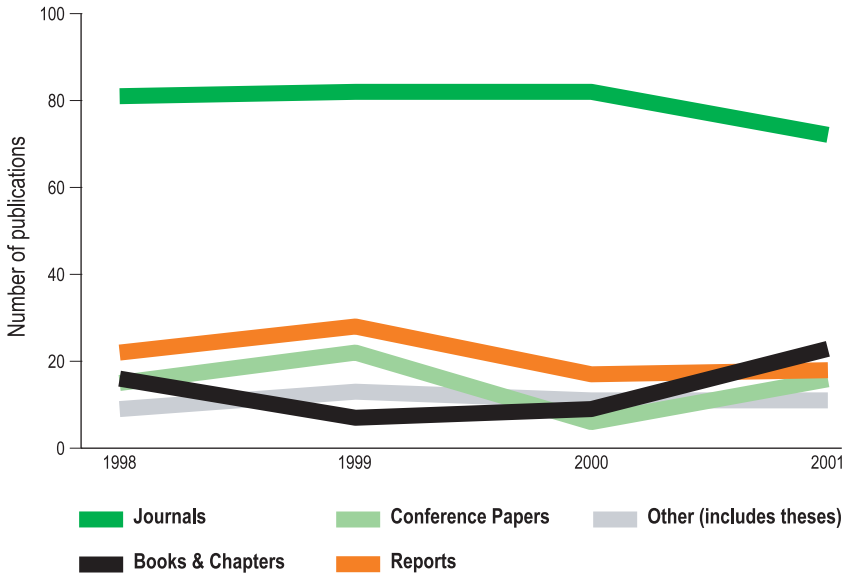
RESEARCH AND DEVELOPMENT

Shift of resources to agreed priority areas

The research program for the current triennium addresses Australian R&D priorities such as sustainability, oceans policy, regional development, global climate change, water quality in the Great Barrier Reef World Heritage Area, exploration of seafloor biodiversity in

OUTCOMES IN THE COMMUNITY – CONSERVATION AND BIODIVERSITY

- AIMS monitored and initiated the quick response to signs that significant areas of the Great Barrier Reef World Heritage Area were susceptible to bleaching over the 2001-02 summer. The bleaching event was monitored and documented in unprecedented detail, giving marine park managers an optimal level of data, as well as insights into the causes and consequences of corals bleaching. The extent and severity of coral bleaching was assessed using aerial surveys, scuba surveys and reef-user reports giving the community a comprehensive picture of a widespread coral bleaching event. Collaboration between science and management agencies on this issue was intensive.
- The AIMS Automatic Weather Station network provided near real-time seawater temperature data throughout the summer – crucial information needed to monitor and respond to the coral bleaching taking place on the Great Barrier Reef. As well as internal users, 22 requests for data were received from external users. These included researchers at CSIRO-Marine, James Cook University, Murdoch University, and University of Western Australia.
- Queensland marine industries, including tourism operators and fishers, were briefed on *Long-Term Monitoring of the Great Barrier Reef, Status Report No.5.* The report, published in December 2001, showed about 17% of the 98 reefs surveyed by AIMS scientists in 2000 were affected by crown-of-thorns starfish (COTS). This was equal to the highest levels since monitoring began in 1985, but was unchanged since 1999. See the long-term monitoring database on the AIMS website for the latest information: http://www.aims.gov.au/reef-monitoring
- Reports of the Global Coral Reef Monitoring Network on the *Status of Coral Reefs of the World,* were viewed as the authoritative source of information on the health of global reefs and cited frequently in government, non-government, scientific and popular literature.
- Improved management of reef resources resulted from collaboration in 80 countries forming operational nodes within the GCRMN. The publication *Coral Reefs, Mangroves and Seagrasses: A Sourcebook for Managers* was produced in-house at AIMS and launched in early 2002.
- Environment Australia used AIMS data from stock surveys of trochus and sea cucumbers (trepang) at Ashmore and Cartier Reefs, during international fisheries discussions with Indonesia regarding negotiations over the MOU74 region of north-west Australia.



support of regional marine planning, decision support for environmental managers, and a renewed focus on the resource-rich Arafura-Timor Seas. To maximise synergies and production efficiencies, the science base was restructured in late 2001 around the Institute's core capabilities of conservation and biodiversity, coastal processes and marine biotechnology. Likewise, the 18 interdisciplinary projects delivering research goods and services were adjusted in minor ways to improve delivery of the Research Plan.

Publications and Patents

In the breakdown of publications below and in the full *Publications List* provided at Appendix 3, it is clear that total published scientific output in 2001 increased from 125 to 142, with the production of books and book chapters more than doubling – from 9 in 2000 to 23 in 2001. The AIMS publication *Soft Corals and Sea Fans* by Drs Katharina Fabricius and Philip Alderslade, launched in July 2001, was reviewed favourably worldwide and sold well.

The three-volume colour book *Corals of the World*, by Drs John Veron and Mary Stafford-Smith, a guide to the identification of corals, performed well in its second year of sales, particularly in North American and European markets, with sales of $65,247.

A 12% fall in journal publications was related to the traditional mid-point in the Research Plan where the emphasis is on fieldwork, as well as disruption caused by decommissioning and refurbishment of laboratories and offices. An increase in journal publications is expected in the next reporting period. Noteworthy technical reports in 2001 included one produced for the GBRMPA entitled *Great Barrier Reef Catchment Water Quality Action Plan: A Report to Ministerial Council on targets for pollutant loads*, and several produced for Woodside Energy on groundbreaking deepwater sampling of biodiversity on the North West Shelf. *Long-term Monitoring of the Great Barrier Reef Status Report No. 5* was published in December 2001 and attracted wide community

SPECIAL REPORT: THE HEALTH OF THE GREAT BARRIER REEF

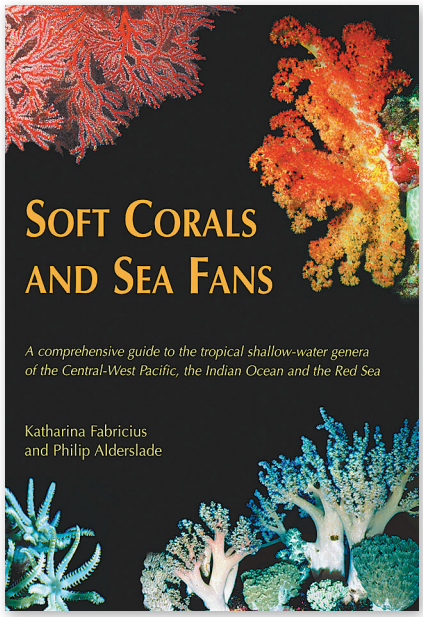
The Great Barrier Reef (GBR) is one of the best managed and healthiest coral reefs in the world – as assessed by the Global Coral Reef Monitoring Network led by AIMS scientist Dr Clive Wilkinson. Most of the world's corals reefs, however, are in relatively poor condition and many are in a state of rapid decline as a result of over-fishing, destructive fishing practices, sediment and nutrient runoff, and coral bleaching. Major threats to the health of the GBR are declining water quality in near-shore areas, coral bleaching as a result of global warming, crown-of-thorns starfish (COTS) outbreaks, and effects of fishing.

The effects of fishing are the most readily managed of these threats in the GBR. A management plan for the trawl fishery was recently put in place and a draft plan for the other major fishery, the reef line fishery, for which AIMS was a principal advisor, is about to be published.

Runoff of sediment and nutrients to the GBR has increased several-fold as a result of past and current land-use practices. While there is considerable debate and uncertainty about the impact to date of this runoff on the GBR, there is little question of the threat it presents to near-shore reefs and other habitats such as seagrasses. AIMS is playing a leadership role, in partnership with the Great Barrier Reef Marine Park Authority (GBRMPA) and CRC Reef in particular, on this issue. This includes critically reviewing the available evidence; preparing a consensus statement; being a key source of advice for GBRMPA, including the setting of catchment runoff targets; and running a large, experiment to compare near-shore reefs experiencing enhanced runoff with those that are not.

The AIMS long term monitoring program is the primary source of advice for GBRMPA on the health of coral reefs of the GBR. The program covers the length and breadth of the GBR, carrying out annual broad-scale surveys that include assessments of COTS since 1986 and detailed studies of fish, corals and other benthic fauna since 1992. The 2001 surveys suggest that, in terms of numbers of reefs experiencing outbreaks, the current outbreak may have peaked in 1999 and 2000 (outbreaks on17% of reefs surveyed compared to 11% in 2001). The percentage of reefs experiencing outbreaks in 1999 and 2000 was the same as that recorded at the peak of the last outbreak cycle (17% in 1987).

Coral bleaching, and subsequent mortality, as a result of unusually high seawater temperatures has recently loomed as a major threat to the GBR and coral reefs worldwide. While a number of significant bleaching events were documented on the GBR between 1980 and 1997, the extent of bleaching in 1998 was massive in comparison. Very extensive bleaching also occurred in the summer of 2001-02. With sea temperatures expected to continue to rise as a result of global warming, extensive coral bleaching and subsequent coral death is a major threat to coral reefs everywhere. The threat is not amenable to management in the short to medium term and affects pristine reefs. A major collaborative and international research response by AIMS to this threat is described elsewhere in this report.



AIMS BOOK LAUNCHED JULY 2001

attention, particularly as it documented infestations of the predator crown-of-thorns starfish equal to the highest levels recorded since monitoring began in 1985.

About 60% per cent of AIMS publications in peer-reviewed journals in 2001 were co-authored by researchers outside the Institute, illustrating the strength of collaborations underpinning interdisciplinary science done at AIMS (see *Coordination of Research* which follows). One-third of all scientific publications were co-authored with scientists from other countries. Another third included collaborations with scientists, academics and students from Australian organisations. One-quarter of the remainder involved cross-disciplinary collaborations among AIMS staff. The Marine Biotechnology Group performed particularly well this year, with 42 scientific articles published in professional journals in 2001.

AIMS holds 56 individual granted patents in five patent families. Forty-five of these relate to UV blocker sunscreen technology, nine relate to the WetPC™/KORD™ technologies, and two concern coral bone-substitute intellectual property. The provisional patents from the last reporting period (including those arising from the prawn biology discoveries and the herbicide and algal toxin work) are proceeding to examination.

PRIZES, AWARDS AND ASSOCIATIONS

In recognition of their professional standing, AIMS scientists served as editorial and/or board members for at least 15 international scientific journals in 2001-02 (see table).

Individual staff were also recognised through prizes, awards and associations. The following are noteworthy:

PUBLICATIONS AT 30 JUNE 2002

	1998	1999	2000	2001
Journal Articles	81	82	82	73
Books and Chapters	16	7	9	23
Conference Papers	15	22	6	16
Technical Reports	22	28	17	19
Other (includes theses)	9	15	11	11
Total	143	152	125	142

OUTCOMES IN THE COMMUNITY – COASTAL PROCESSES

- AIMS estimates of sediment and nutrient amounts in runoff formed the basis of the Great Barrier Reef Marine Park Authority's *Water Quality Action Plan,* setting targets for reducing pollution runoff into the Great Barrier Reef. A new book in production at AIMS, titled *Catchments and Corals,* will spotlight runoff issues and bring together data collected over 15 years.
- Biomarkers were used to build an early warning system for environmental degradation, helping resource managers to avoid crossing the threshold of lethal stress.
- Resource managers in the Great Barrier Reef World Heritage Area benefited from the development of real-time models of water circulation, a large-scale eco-hydrological model predicting reef degradation, and a coral bleaching risk-map.
- Aquaculture trials in the Mekong delta showed that low-cost changes to farm design and management can increase black tiger prawn survival from less than five per cent to up to 40 per cent. Technology transfer occurred through workshops and demonstrations to farmer groups and extension staff. A training manual in English and Vietnamese, was made available online at www.aims.gov.au, or at www.enaca.org
- The prawn industry in West Australia's Exmouth Gulf benefited from research confirming that deep-sea upwelling fuels the region's amazing biological productivity. This will help in predicting recruitment strength and food chains supporting prawn harvests.
- Environmental managers in WA were given forecasts of whale shark aggregation at Ningaloo Reef. These forecasts will help to regulate the growing eco-tourism industry based on the annual migration of whale sharks to WA waters.
- Northern communities in WA took a keen interest in the findings of an AIMS study showing dams and other human impacts have contributed to major siltation of the Ord River estuary. Newspapers in the region led public debate on this research. The data collected by AIMS scientists will be used to develop computer models predicting future changes in water currents and siltation trends in the Ord River-Cambridge Gulf system.
- The National Oceans Office was the main recipient of new information on hydrocarbon and groundwater seeps in the Timor Sea. This research is illuminating knowledge of ecological processes relating to the seepage and the potential impacts of oil and gas exploration.

AIMS REPRESENTATION – INTERNATIONAL JOURNALS:

Aquatic Conservation - Marine and Freshwater Ecosystems	Professor Stephen Hall (Editorial Board)
Coral Reefs	Dr David Barnes (Biological Editor), Dr Terry Done, Dr Janice Lough, Dr Dan Alongi (Associate Editor)
Deep-Sea Research	Dr Dan Alongi (Associate Editor)
Ecosystems	Dr Terry Done (Subject Editor)
Estuarine, Coastal and Shelf Science	Dr Eric Wolanski (Editor), Dr Dan Alongi (Editorial Board)
Fisheries Oceanography	Dr Peter Doherty (Editorial Board)
Fisheries Research	Professor Stephen Hall (Editorial Board)
Journal of Animal Ecology	Professor Stephen Hall (Editorial Board)
Journal of Plankton Research	Dr Miles Furnas (Editorial Board)
Marine and Freshwater Research	Dr Peter Doherty (Advisory Committee Member)
Marine Ecology Progress Series	Dr David Klumpp (Editorial Advisor)
Oecologia	Dr Peter Doherty (Editorial Board)
Organic Geochemistry	Dr Kathy Burns
Wetlands Ecology and Management	Dr Eric Wolanski (Editor), Dr Dan Alongi (Editorial Board)
UNESCO Encyclopedia of Life Supporting Systems, Theme 16	Dr Eric Wolanski (Chief Editor)

- In recognition of her scientific standing in oil pollution research, Dr Kathy Burns was invited by the Government of Saudi Arabia to take part in a 10-year re-assessment of oil pollution impacts in the Arabian Gulf resulting from the 1991 Gulf War.
- The US National Oceanic and Atmospheric Administration invited Dr William Skirving to be part of its sea-surface temperature calibration and validation team. Dr Skirving will be based in Washington for three years.
- Dr Eric Wolanski received a 'special mention' in the judging of the International Marine Environmental Award 2001 by the *Confederation Mondiale des Activities Subaquatiques*. He was also invited by UNESCO to lead an estuarine eco-hydrology project and to edit a section of the UNESCO Encyclopaedia of Life Supporting Systems.
- In recognition of his stature in marine toxin research, Dr Lyndon Llewellyn was appointed to the Scientific Advisory Committee for the 6th Asia Pacific Congress on Animal, Plant and Microbial Toxins.
- Dr Walt Dunlap was a visiting research fellow sponsored by the Australian Academy of Science and the Japan Society for the Promotion of Science in April-May 2002. He undertook collaboration at the University of Tokyo and the Osaka City University Medical School.
- Dr Dan Alongi was invited to assess the future of the world's mangrove ecosystems for the Foundation for Environmental Conservation, and provided the keynote presentation for the Foundation's website (http://www.icef.eawag.ch).

OUTCOMES IN THE COMMUNITY – MARINE BIOTECHNOLOGY

- The National Oceans Office used biogeographic information for various regions of Australian coastline provided by AIMS.
- The launch of a Cleveland Bay CD-ROM brought together North Queensland collaborators with a stake in region's marine resources. AIMS bioinformatics formed integral part of project.
- The prawn industry backed development of prawn broodstock management policy.
- AIMS helped to drive the biggest aquaculture collaboration in Australian history (four research agencies, industry body, fisheries body and three major farms) to overcome final barriers in breeding and rearing domestic black tiger prawns.
- The spin-off company ToxiTech raised investment from the Federal Biotechnology Innovation Fund, Queensland's Innovation Start-up Scheme, and private investors.
- The Australian Research Network for Algal Toxins, hosted by AIMS and constantly updated, proved a pivotal force in building collaborative links. The ARNAT website (www.aims.gov.au/arnat) became an information nexus for collaborators.
- A milestone was achieved in the transfer of intellectual property to industry, with novel herbicide discoveries advancing to glasshouse testing stage. Agrichemical company Nufarm reported "preliminary results are very encouraging".
- Scale-up research on sea-ranching of sponges demonstrated its potential as a future regional industry and source of employment.
- AIMS discovery of anti-ageing enzyme activity in marine bacteria attracted world attention and won support of the Australian Academy of Science and the Japan Society for the Promotion of Science.
- The provisional patent *Induction of spawning in Crustacea* progressed to national-phase application.
- The use of genetics research aided the design and management of Marine Protected Areas.
- Coral reef researchers and Reef managers showed great worldwide interest in the discovery that some corals could withstand heat stress better than others.
- Antarctica New Zealand agrees to second year of funding for research into human impacts on Antarctic sponges.

- In a similar vein, Professor Stephen Hall was invited to assess the future of the world's continental shelf benthic systems for the Foundation for Environmental Conservation. In addition, he was a Pew Fellow in Marine Conservation and a member of several prestigious advisory bodies, including the Marine Stewardship Council Technical Advisory Committee, the Antarctic Research Assessment Committee, and the US National Research Council Advisory Panel. As an assessor with the UK Ministry of Agriculture, Fisheries and Food, he reviewed a program on ecosystem effects of fishing.
- Dr Madeleine van Oppen, Dr Terry Done, Dr Katharina Fabricius and Craig Steinberg were appointed to the *Transforming Marine Conservation Initiative* of Nature Conservancy and Conservation International.
- Dr Andrew Heyward sat on two statutory committees in Western Australia, as well as a technical advisory committee for the WA Department of Environment Protection. He is an international committee member of the Research Institute of Subtropics in Japan.
- Dr Peter Doherty was appointed to the Queensland Government Irukandji Jellyfish Research Working Group. (Irukandji were responsible for two deaths in North Queensland waters over the 2001-02 summer.) He also provided advice to Harvest MAC (Harvest Fishery Management Advisory Committee).
- Dr Janice Lough advised the Great Barrier Reef Marine Park Authority about possible age and rarity of large *Porites* bommies found in the Nelly Bay harbour redevelopment.
- Dr Terry Done was president of the International Society for Reef Studies.
- Dr Miles Furnas was on the Expert Scientific Panel for the Queensland Reef Protection Task Force, the Water Quality and Coastal Development Research Advisory Committee, and a technical advisory group of the CRC for Catchment Hydrology.

LIAISON AND COLLABORATION

Contribution to Australia's research future through teaching and training

An extensive international network of research collaborations ensured a healthy throughput of visiting scientists in 2001-02, including a record 59 graduate and postgraduate students supervised by AIMS staff. About 50% of these students are Australian, and the other international students are drawn to AIMS by our scientific reputation. They come from all over the world, including the United States, United Kingdom, Europe and Asia. Many students were included in the supervisor's research team. In addition, 10 high school students received training in work experience programs.

The Institute has reintroduced a competitive funding award for postgraduate students who conduct most of their research at AIMS. Three PhD students have received awards from the Institute of $30,000 over three years for research expenses. Claire Bennett (University of Melbourne), Alison Robertson (James Cook University) and Carolyn Smith (University of

TEACHING / TRAINING TO JUNE 30

	99/00	00/01	01/02
Research students supervised by AIMS staff	55	52	59
Thesis completions during the year	14	10	4
Conjoint teaching positions undertaken with universities	6	5	12

Queensland) were in the second year of their award program in 2001-02.[4]

During the reporting period there were 12 conjoint/adjunct appointments of AIMS scientists at various universities. Staff members were involved mainly in the provision of special lectures and advisory work relating to student theses. Six appointments were at James Cook University and the others were at the University of Queensland, Central Queensland University, the University of Western Australia, Flinders University and the University of Manitoba (Canada).

The JCU School of Tropical Biology reported great satisfaction with AIMS teaching and training contribution. The Head commented:

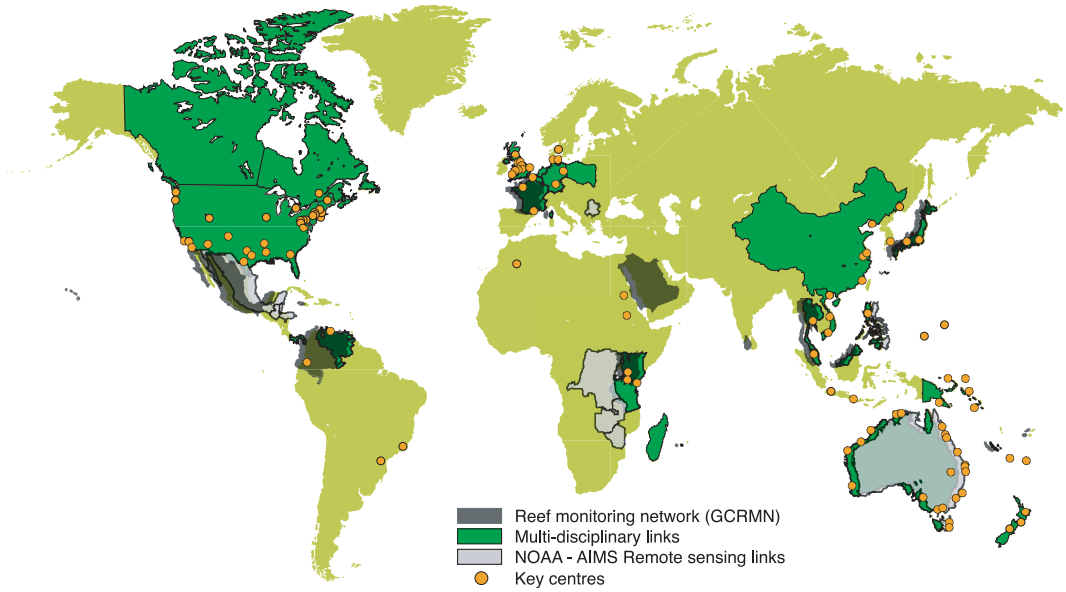
> In 2001 I instituted a new level-3 block-mode subject, *BZ3212 Tropical Wetlands Ecology and Management,* in the School of Tropical Biology at JCU. In it I sought expertise from a number of areas to allow students access to that expertise, and to provide them with a variety of approaches to problem solving. I naturally looked towards expertise at AIMS, particularly in relation to the ecology of coastal wetlands. Both Gregg Brunskill and Mike Cappo agreed to provide a lecture each. I am happy to say that both presentations were very well received, both by me, in that they provided exactly what I was after (excellent information otherwise not provided in the course, in an appropriate scientific context), and by the students, who were suitably impressed by the presenters and their presentations. Follow-up surveys of the students indicated high levels of satisfaction with the course and the AIMS content. Gregg and Mike were good enough to contribute again this year, and were

COLLABORATIONS TO JUNE 30

	99/00	00/01	01/02
National collaborations	81	93	112
International collaborations	81	110	110
Network of collaborating nations	28	27	80
Countries where collaborations took place	24	21	29

[4] Their projects are respectively titled: 'Measuring human impacts in coastal marine environments: Validation of laboratory biomarker research'; 'The biology and function of saxiphilin, a novel paralytic shellfish toxin binding protein'; and 'Heat stress response of scleractinian corals: Implications for bleaching susceptibility and thermal adaptation/acclimation'.

NATIONS COLLABORATING WITH AIMS



> similarly well received. I hope they will be able to continue their involvement in the future. The lectures were delivered at AIMS - I regard this important as it demonstrates links between organisations, between the different systems covered in the course, and between scientists with otherwise different research agendas.

Many staff also gave public lectures and community seminars during 2001-02 or raised public awareness of science through the Australian and international news media. For example, the Marine Biotechnology Group held 18 public lectures and engaged the media on a range of issues, including the development of technologies such as natural herbicides to protect crops and a test-kit to prevent paralytic shellfish poisoning; the discovery of an environmental adaptation in bacteria useful in anti-ageing research; and expeditions to Antarctica to examine human impacts on sponges. Likewise, researchers in the Coastal Processes Group were called on extensively to talk to public groups on the impacts of runoff on the Great Barrier Reef and water quality generally; they also gave private briefings to State and Federal Parliamentarians. In the Biodiversity and Conservation Group, worldwide awareness of coral bleaching on the Great Barrier Reef resulted from engagement with all forms of media, including the World Wide Web.

COORDINATION OF RESEARCH AND LINKAGES WITH DECISION-MAKING BODIES

Coordination of research through collaboration and research networks is the lifeblood of a science organisation like AIMS. Australia's Chief Scientist, Dr Robin Batterham commented in his Review of Marine Research in Tropical Australia on the high level of collaboration taking place across academic disciplines and often in conjunction with industry partners:

> The Townsville model itself is dynamic. Where the grouping does not have expertise in particular fields, this is brought into research projects through collaborative arrangements. Fisheries population modelling and statistical analysis are cases in point. The Townsville grouping has strong and clearly effective links to other centres of expertise.

This pooling of expertise results in quality research output. Dr Batterham said bibliometric reports of AIMS research output "showed a degree of excellence that would be expected only of research organisations of world standing".[5] A list of memberships in external committees and NGOs is provided at Appendix 2.

In all, there were 112 national research collaborations and 110 international collaborations. The Institute's network of collaborators crisscrossed more than 80 countries, with research taking place in at least 29 countries. The table below shows collaborative links gradually rising, a trend recorded for the past six years. The major rise from 27 to 80 in the network of collaborating nations is due to the inclusion, for the first time, of links formed by the Global Coral Reef Monitoring Network, hosted by AIMS. Noteworthy collaborations folllow:

- AIMS is the largest partner in the Cooperative Research Centre for the Great Barrier Reef World Heritage Area (CRC Reef). This is a knowledge-based partnership of coral reef managers, researchers and industry providing research solutions to protect and conserve the Great Barrier Reef. Senior AIMS scientists lead two of its four programs – Research Director Dr Peter Doherty leads Program C *Maintaining Ecosystem Quality*, and Senior Principal Research Scientist Dr Terry Done leads Program D *Information Systems and Synthesis*.
- The National Oceanic and Atmospheric Administration collaborates with both AIMS and the Great Barrier Reef Marine Park Authority to monitor and predict coral bleaching on the reef. In January 2002, a three-day workshop instigated by this collaboration brought together a group of 30 international scientists, satellite oceanographers, reef managers and representatives of world funding bodies (i.e. the World Bank) to discuss remote sensing techniques for measuring sea surface temperatures and water quality, both important to the health of corals.
- AIMS and the CSIRO collaborated in a range of areas in 2001-02, e.g. research into whale shark migrations at WA's Ningaloo Reef, modelling of water circulation and temperature, algal biotoxins, prawn domestication, impacts of global warming on the Great Barrier Reef, and the collaboration and validation of satellite data. The Institute's collaboration with CSIRO led

[5] Dr Robin Batterham, Review of Marine Research in Tropical Australia, p.15.

to a female whale shark being tagged with a satellite tracking device at Ningaloo Reef on April 22. It also led to advances in radiometer technology capturing infrared radiation given off by the sea surface. This is converted into temperatures and is useful in studying coral bleaching.

- Governments and research institutes in 80 countries are linked to AIMS through the Global Coral Reef Monitoring Network. This network is coordinated through AIMS and provides research solutions to ensure the world's coral reefs are managed and used in ways that are sustainable and protect ecosystem quality.
- AIMS and WA's Department of Conservation and Land Management (CALM) collaborated in monitoring surveys of Ningaloo and Rowley Shoals, and in oceanography studies and whale shark research at Ningaloo Reef.
- The largest collaborative prawn aquaculture research project in Australian history began in 2001-02 on the black tiger prawn. The project involves AIMS, two divisions of CSIRO and the Queensland Department of Primary Industries, and is being funded by the Fisheries Research and Development Corporation with support from the Australian Prawn Farmers Association and several major farms.
- Collaboration with Antarctica, New Zealand and the University of Canterbury has led to a three-year study on the use of marine sponges, and the bacteria that live on them, in monitoring the health of the planet's polar regions. Two scientific expeditions to Antarctica took place during the reporting period.
- AIMS coordinates the Australian Research Network for Algal Toxins (ARNAT), and the Australian Coral Records Research Group (AUSCORE), the latter bringing together scientists in the field of coral-based paleoclimatology.
- AIMS executives also met with their counterparts in other Australian science agencies to exchange ideas and coordinate research. These forums included the Heads of Marine Agencies, the Coordination Committee on Science and Technology, and meetings with CSIRO management.

POLICY INPUT

The Institute has provided major input to state, national and international forums, particularly on development of policy and regulatory guidelines and frameworks for access to biogenetic resources and benefit-sharing. The AIMS experience is useful because it represents a microcosm of the issues and perspectives impacting on policy-making. AIMS has the dual role of being a Commonwealth statutory authority and a biotechnology market player (with a major ex-situ collection of Australian marine biodiversity). The Institute's approach of separating the process of negotiating access permission from resource managers, away from that of negotiating monetary and non-monetary benefits with Governments and resource owners and providers, has been adopted by several legislative and regulatory regimes within Australia.

Examples of linkages with decision-making bodies in 2001-02 are listed below.

- In September 2001, the Report *Bioprospecting: Discoveries changing the future*, prepared by the House of Representatives Standing Committee on Primary Industries and Regional Services, was tabled in Parliament; known as the Bailey Inquiry, this report cites AIMS at least 40 times, drawing extensively on oral and written evidence presented by the Institute.
- In December 2001, the Institute provided a submission on the draft access and benefit-sharing regulations being drawn up for the Environmental Protection and Biodiversity Conservation Act (1999). This input was the culmination of our previous major input to the Voumard Inquiry on 'access to biological resources in Commonwealth areas'.
- In February 2002, AIMS provided a submission to inform revision of the Draft Ministerial Policy Guideline for the Grant of Approvals and Authorisations to Take or Handle Fish for Genetic or Chemical Extraction or Analysis, prepared by the Department of Fisheries, Western Australia.
- In March 2002, AIMS provided further input to the Federal Government's response to the recommendations of the Bailey Inquiry.
- Also in March, the *State of the Environment 2001* report was tabled in Parliament. AIMS scientists provided data and expert advice to the 'biodiversity' and 'coasts and oceans' sections of this major report.
- In April 2002, the Queensland Biodiscovery Policy Discussion Paper reported that the State's landmark biodiscovery benefit-sharing agreement with AIMS has "raised the profile of the Queensland biodiscovery industry and has resulted in the negotiation of further biodiscovery benefit-sharing agreements".
- In June 2002, a background paper prepared for the Genetic Resource Management Task Group within Environment Australia reinforced the Institute's relevance and contributions to policy debates in the following reference:

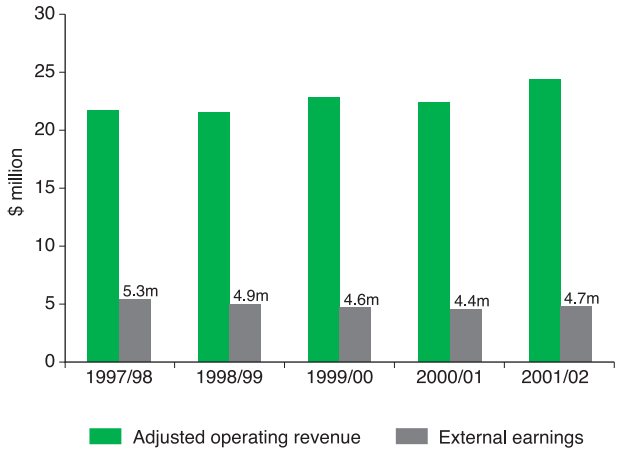
> The Australian Institute of Marine Science is a leader in the field of biotechnology research in Australia. Moreover, the unique nature of the Institute as collector, curator, steward, and developer of biodiversity, as a government agency and as a market player, means that a consideration of its experiences will provide a useful overview of current industry issues in microcosm.

TECHNOLOGY TRANSFER AND COMMERCIALISATION

External earnings for research services

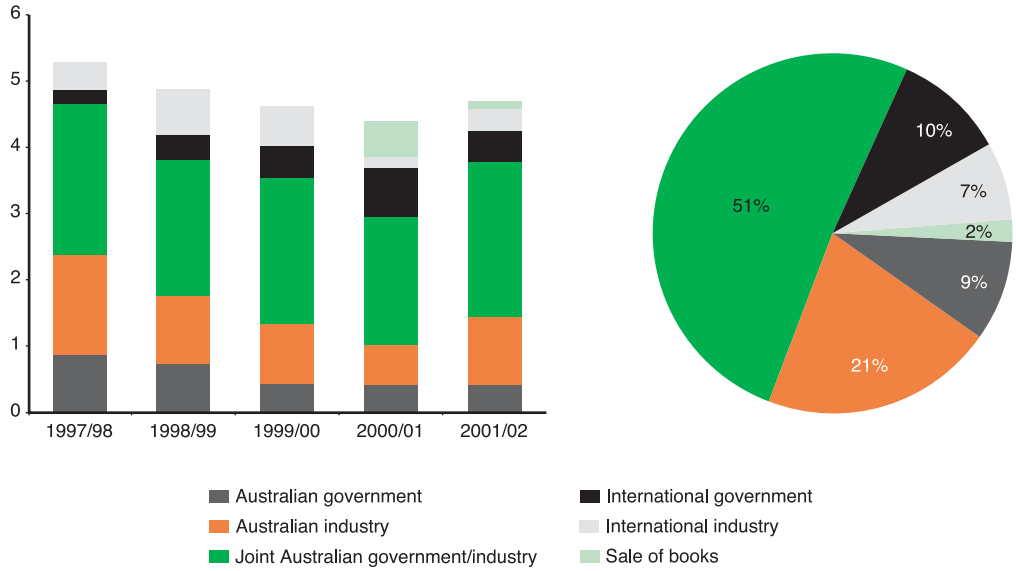
Total external earnings increased from $4.4 to $4.7 million between 2000-01 and 01-02, reversing a trend of declining external earnings since 1997. Excluding revenue from book sales, this increase is from $3.86m to $4.59m, indicating a rise in earnings from contracted research of 19%. The overall figure puts the Institute close to the 20% target set for external earnings by the Commonwealth Government. Given earlier projections, and the disruption caused by the biggest refurbishment program

EXTERNAL EARNINGS OVER LAST FIVE YEARS



AIMS EXTERNAL FUNDING SOURCES 2001/2002

Total External Funding of $4.707m



in the Institute's history, this is a good result. External funding sources included international industry partners and Australian business, international governments and government-backed agencies, joint government-industry contracts at both national and international level, and the sale of AIMS publications. The Australian Government is still the Institute's major client, providing the bulk of revenue to deliver the 2000-2003 Research Plan. In 2001-02 appropriation funding was $19.6 million providing a total operating revenue of $24.3 million.

Adoption by users of practices, instruments and processes

The Institute's protocols for monitoring the health of the Great Barrier Reef have been adopted by many other countries as a defacto global standard. AIMS scientists are often invited to give presentations on reef monitoring survey methods, data analyses and Web-reporting. For example, the Department of Marine and Wildlife Resources of American Samoa invited Dr Hugh Sweatman to give a workshop in Pago Pago in March 2002.

The database established by the Long Term Monitoring Program is accessible via the AIMS website (www.aims.gov.au). This Web tool is constantly upgraded by the monitoring team to ensure it delivers the latest data on the status of reefs in the Great Barrier Reef Marine Park, and the distribution and abundance of reef biota. In particular, it helps environmental managers to assess impacts of human activities within the marine park and make decisions aimed at ensuring sustainable use. The reef monitoring team add about 300 web pages per year to the database, or four pages for every reef surveyed. This is a massive effort but one that provides a trusted empirical context for reef managers and researchers alike.
In addition, the reef monitoring team published about 500 copies of *Status Report No.5* in December 2001.

In a similar way, AIMS data was used by GBRMPA in developing the Representative Areas Program, in assessing coral bleaching, and in setting water quality targets. Biomarkers were used in developing an early warning system for environmental degradation, helping resource managers to avoid crossing the threshold of lethal stress. Finally, scientists in the Conservation and Biodiversity Group have increased their efforts to transfer taxonomic and biogeographic data, particularly to key decision-makers guiding coral reef management, both in Australia and overseas. (See *Health of the Great Barrier Reef* and *Science Reports.*)

For the global market, AIMS produces the *Status of Coral Reefs of the World* series on behalf of the Global Coral Reef Monitoring Network. In 2001-02, the Institute also produced a guide for the network entitled *Coral Reefs, Mangroves and Seagrasses: A Sourcebook for Managers* (co-authored by Frank Talbot and Clive Wilkinson). It was written "for the practising resource manager in developing countries, who may have limited training in science but is still required to manage complex ecosystems". AIMS also produced training manuals in English and Vietnamese for the Australian Centre for International Agricultural Research. These are designed to improve production on aquaculture farms in the Mekong delta.

Increasingly, technology transfer at AIMS occurs within a commercial paradigm. AIMS

engineering services staff frequently develop innovative tools for AIMS researchers that have wider commercial applicability. During the reporting year, they completed the documentation of a river logger system for commercial licensing. These automated loggers measure water quality, fundamental to the health and function of coastal ecosystems. They overcome the logistic challenge of simultaneously sampling many river mouths during tropical summer downpours, and once activated by rising water levels, they record sediment load by measuring light penetration through the water. Calibrated by cross-reference with direct measurements of many water samples collected by hand, the light measurements can be converted into estimates of the tonnes of nutrients flowing into coastal receiving waters. An Australian company is now evaluating this unique instrumentation for commercialisation.

As well as technology transfer through patents, licenses and royalty income, AIMS scientists across all groups advise and engage constantly with industry bodies, environmental agencies, schools and community groups, and/or their scientific peers. The sharing of knowledge is seen as important as the discovery itself, and the dialogue is ongoing. During the year AIMS scientists gave more than 170 formal presentations as well as many informal talks on their work to diverse audiences. This represents a 37% increase in science transfer and community outreach over the previous reporting year. The diversity of presentations is illustrated by these examples:

- Nufarm executives visited AIMS in February for briefings and update on herbicide discovery project.
- AIMS organised the third workshop of Australian Research Network for Algal Toxins, held after the 5th International Toxic Cyanobacteria Conference.
- Briefings and presentations were given to Queensland Ministers for Innovation and Information Economy, Environment, and State Development;
- Briefings and presentations were given to Palm Island Aboriginal community officials and traditional owners.
- Young Farmers in Ingham heard a lecture on Herbert/Hinchinbrook carbon mass balance.
- A presentation was given to the Australian Prawn Farmers Association in Cairns on water column processes in mangrove creeks receiving aquaculture effluent.
- AIMS staff led a range of workshops and seminars at the Great Barrier Reef Marine Park Authority, transferring latest findings to reef managers.
- The Third International Billfish Symposium in Cairns was informed of environmental factors influencing the activity of black marlin.
- The National Greenhouse Office was given the latest data on AIMS climate change research.
- Presentations were provided to American Geophysical Union Ocean Sciences meeting in Honolulu.

Dr Clive Wilkinson, who coordinates the Global Coral Reef Monitoring Network, attended more

than a dozen international forums, including the Global International Waters Assessment assembly in Sweden, a meeting of the International Coral Reef Action Network in Mozambique in November, and the World Heritage Site selection workshop in Hanoi in February.

JOINT VENTURES AND STRATEGIC ALLIANCES

The Institute has benefited from strategic alliances with other research agencies and universities in taking forward joint discoveries and transferring the results of joint research to industry and government.

The Institute's underwater computing technology, licensed to WetPC Pty Ltd, is being sub-licensed to manufacturers in several applications. The coral sunscreen, licensed to Sunscreen Technologies Pty Ltd, is being tested for a range of uses by industrial partners.

In a joint venture with James Cook University, AIMS has formed an equity-building vehicle, ToxiTech Pty Ltd, designed to attract capital to build an enterprise around algal-derived toxin testing technology. ToxiTech has begun its first round of capital- raising.

The co-developed (with James Cook) selective herbicide discovery continues to make good progress towards final development through an alliance with the world's ninth largest agrichemical corporation, NuFarm Australia Limited.

Likewise, AIMS has entered into a collaborative research agreement with Australian and international agribusiness and investment companies (Westernhigh Pty. Ltd., Greenfields Resources Holdings and Pennington Seeds Inc.) for the purpose of jointly developing environment and agriculture business opportunities in China. This strategic alliance, supported also by an AusIndustry (DITR) grant, is founded on a research and development project entitled "Solving pollution in waterways of China".

SPIN-OFF BUSINESS

AIMS entered a joint venture with James Cook University to spin off ToxiTech Pty Ltd during the reporting period. ToxiTech was incorporated to market a test kit for preventing paralytic shellfish poisoning. It has raised investment from the Commonwealth Biotechnology Innovation Fund, Queensland's Innovation Start-up Scheme and private investors. This venture is consistent with *Backing Australia's Ability* and Objective 10 of Australia's *Marine Science and Technology Plan,* "to promote the potential of new and emerging industries, services and technologies".[6] (See *Business Development* and the science report, *Marine Biotechnology*.)

CUSTOMER SATISFACTION

AIMS registered 18 contracts for scientific research services (including grants and consultancies) during the reporting period. A total of 55 reports were submitted as a result of AIMS' externally funded research. Five more reports were in the process of being finalised at June 30, with the contractor's consent. All of this work came from repeat customers. For example, Woodside Energy has sought AIMS expertise and funded collaborative research relevant to a number of locations in the North West offshore environment continuously since 1993. In the reporting year, this included research into both deep-sea benthic (seafloor) environments, biological oceanography, coral reef monitoring and studies into the behaviour of whale sharks at Ningaloo Reef. Another

[6] Australia's Marine Science and Technology Plan, pp. 87-89.

collaborator in this project, the Western Australian Museum, commented that: "the AIMS survey has provided the first material available for these groups and is a significant contribution to our knowledge of the fauna of the region".

In a similar vein, the Institute's commercial partners provide excellent feedback. For example, the agrichemical company Nufarm commented in its 2001 Annual Report that "preliminary results are very encouraging" from collaborative research with AIMS and JCU aimed at commercialising new natural herbicides. The "most promising candidate molecules" are now in synthesis development at Nufarm's French laboratories.
Publications by AIMS scientists, including *Soft Corals and Sea Fans*, *Corals of the World* and *Oceanographic Processes of Coral Reefs* received many favourable reviews in the reporting year. In May 2002, the *Advanced Aquarist's Online Magazine* described the former publication in the following terms:

> "This well illustrated field and laboratory guide significantly adds to the project of solving the problems associated with improving specimen viability by providing the information necessary for reliable identification of 90 genera known from the Central and Western Pacific, the Indian Ocean and the Red Sea, along with some information on their natural habitats."

In the conservation area, AIMS scientists were commended for their research on Banda Island coral reefs. The Nature Conservancy's *Coastal and Marine Program – Indonesia* commented:

> "Thank you very much for the excellent Banda report. I will send one to UNESCO and post the soft copy on the e-project site for the others. This has been a very enjoyable experience and I am looking forward to other projects with AIMS in the future".

Likewise the University of Washington expressed thanks to the AIMS Coastal Processes Group for its scientific ability and leadership. The School of Oceanography reported:

> "From fieldwork, to laboratory analyses to technical discussions, your research group has once again demonstrated their leadership in coastal sedimentary geochemistry. Myself and the other US scientists in MARGINS, TROPICS, and RiOMar look forward to continued interactions during the coming years. The capabilities and competence of your group significantly add to the professionalism of these international programs."

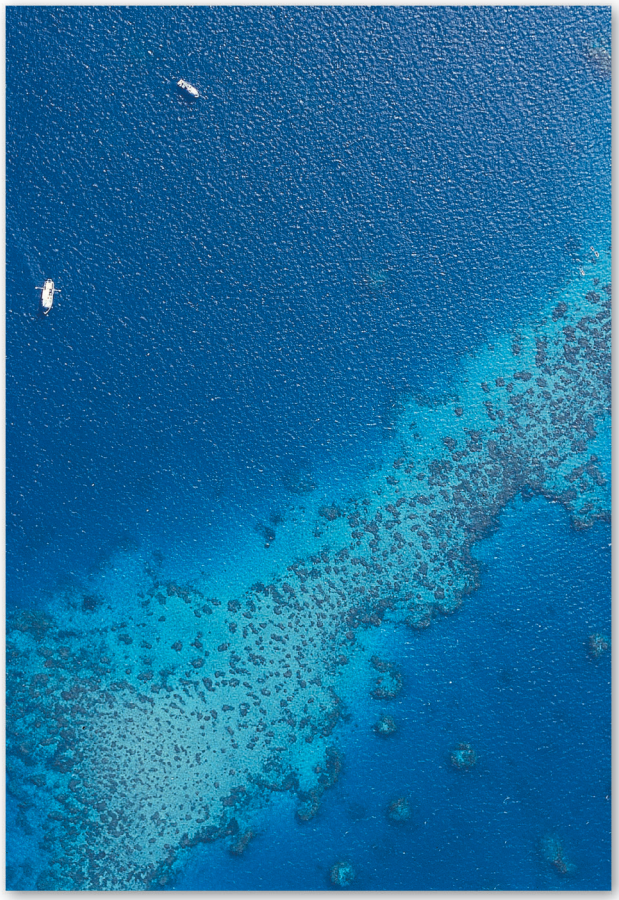
SCIENCE REPORTS

Performance Against Agreed Targets

1.1 Conservation and Biodiversity Group

1.2 Coastal Processes Group

1.3 Marine Biotechnology Group



CONSERVATION & BIODIVERSITY

Research conducted over 2001-02 by the Conservation and Biodiversity Group has continued to improve knowledge of marine biodiversity in northern Australia. Successful transfer of this information, both nationally and internationally, is providing a foundation for conservation and use of these resources (a high national[7] and international[8] priority), which is fundamental to future wealth generation. This is evident from recent estimates of the economic value of environmental services at nearly twice the value of more traditional measures of economic growth such as gross national product.[9]

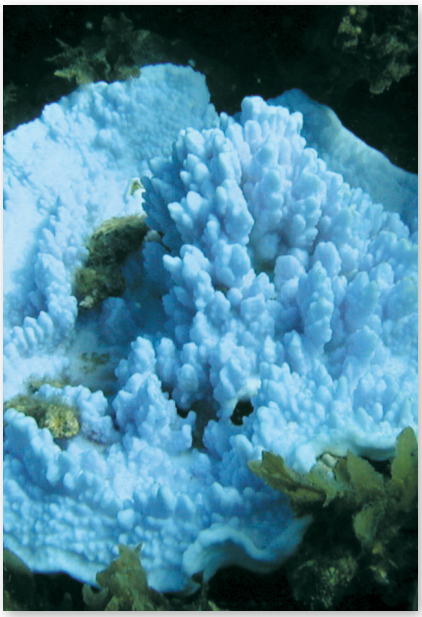
In addition, ongoing programs to monitor coral reef communities on the Great Barrier Reef and in the north of Western Australia, as well as surveys of biodiversity in both State and Commonwealth waters in northern Australia and farther north, have provided new information improving the ability of agencies to create management plans for marine protected areas. Researchers have made advances in the development of non-destructive sampling tools to assess biodiversity in depths out of diving range and in areas where use of conventional techniques is now deemed inappropriate.

A priority in 2001-02 was to improve access to information by users of marine resources. In addition to providing up-to-the-minute data collected by monitoring teams on the status of coral reefs over large geographic areas of the Great Barrier Reef, researchers (supported by CRC Reef) further developed tools for the visualisation of complex data sets and scenario modelling. These tools support natural resource management and have already provided valuable input to managers (e.g. GBRMPA Representatives Areas Program), conservation agencies (e.g. The Nature Conservancy) and other researchers.

STOCKS OF REEF SPECIES IN NW UNDER THREAT

Concern that overfishing, by traditional fishers from Indonesia, was occurring in populations of reef species of trochus and trepang prompted Environment Australia (EA) to support a survey by AIMS of stocks of these species at the newly declared Marine Protected Area of Cartier Reef. The survey found extremely low stocks of the targeted species and supports a previous survey for EA at Ashmore Reef that was requested to provide an update on earlier work at the reef that indicated over-exploitation. The surveys of these northern reefs showed their stocks are several orders of magnitude less than those in equivalent areas of the Great Barrier Reef. The data from both the Ashmore and Cartier Reef surveys has provided timely

7 EPBC Act and Australia's Ocean Policy.
8 The Convention on Biological Diversity.
9 The World Resource Institute (1998) reported a study by Constanza et al in 1997 that valued services generated by healthy natural ecosystems at US$33 trillion a year, nearly twice the value of the global gross national product.



MONTIPORA CORAL BLEACHED PALE BLUE

and extremely useful baselines for future monitoring of these stocks, and may be of particular use in international negotiations to improve sustainable management of the fisheries in Australia's North West.

IMPROVED KNOWLEDGE OF MARINE RESOURCES IN NW AUSTRALIA

Ongoing efforts to assess and describe seabed biodiversity in the North West have provided information on the region's biodiversity previously not available. This information was extended well beyond normal coral reef depths during the past year, with the WA team collecting biota across the North West Shelf and down the continental slope to depths of 900m. In a series of studies of seabed biodiversity offshore from North West Cape, supported by Woodside Energy, the biological communities were investigated using a combination of traditional extractive sampling devices to capture live specimens for taxonomic reference, and modern deep-sea video tools to directly observe the habitats and distribution of life forms on the seafloor. These studies have generated a significant increase in knowledge of biodiversity, particularly of non-fisheries related invertebrate groups, in the deeper waters of Australia's North West.

DATA TRANSFER AIDS CONSERVATION EFFORT

In addition to providing taxonomic and biogeographic data in support of about research projects during the year, scientists have increased efforts to transfer this knowledge through a range of useful products designed to improve knowledge of coral biodiversity and provide information for key decision-makers, guiding coral reef management, both in Australia and overseas. This includes detailed descriptions of coral species that occur in each coral bioregion with species density maps providing enhanced functionality to this vast knowledge base. Maps generated from this data have been used extensively by The Nature Conservancy in support of reef conservation.

The research group's efforts to improve tools, systems and information for key decision-makers also led to the development of powerful decision support methods and software to support the integration of 20 years of research by AIMS into the Representative Areas Program being implemented by the GBRMPA. The group also developed a prototype model of ocean water heating and mixing that predicted the geographic pattern of the 2002 coral bleaching event.

ARMY HELPS TO RETRIEVE CORALS FROM NELLY BAY

ANCIENT CORALS BROUGHT TO AIMS

New collaboration provided a unique contribution to our knowledge of tropical weather patterns. Excavation of material for the Nelly Bay Harbour Redevelopment on Magnetic Island exposed several large *Porites* colonies that were buried under about 0.5m of compacted sediment. Consultation with geologists at JCU suggests the corals could be 4,000 to 7,000 years old. Some special skills were required to collect the corals and bring them back to AIMS for analysis. The 10 Force Support Battalion, Ross Island, successfully retrieved eight of the largest colonies on behalf of the Institute. Carbon dating of two of the corals at the Australian National University indicating the corals died about 6,000 years ago. While analysis is yet to be completed, it is clear from the size of the corals they will each contain about 150-250 years of annual coral (weather) records. They will thus provide a unique "snapshot" of mid-Holocene coral growth, river runoff and other climatic parameters in the vicinity of Townsville, for comparison with future climate and environmental changes. AIMS is grateful for community support in this collaborative effort.

UNESCO INITIATIVE

AIMS researchers made an important contribution to a UNESCO initiative to have the Banda Islands – Indonesia's famed 'spice islands' – listed as a World Heritage Site, based on both their cultural and natural history heritage. These tiny volcanic islands between Darwin and Ambon are fringed mainly with narrow wave-exposed fringing reefs. Working with Indonesian counterparts and support from The Nature Conservancy, Diversitas and the French Total Foundation, the AIMS team was the first to characterise the islands' rich coral communities, and to assess human impacts on the coral reefs. They found there was little damage to the reefs, unlike many other parts of Indonesia where reefs can be badly polluted, blanketed in silt, or destructively over-fished using nets, lines, bombs or poisons.

SATELLITE TAG HELPS SCIENTISTS TRACK WHALE SHARK

Understanding the biology of the world's largest fish was taken to a new level, as AIMS scientists undertook a study of biological oceanography and the behaviour of whale sharks near Ningaloo, Western Australia. The research, supported by Woodside Energy and involving collaboration with CSIRO and the WA Department of Conservation and Land Management (CALM), sought to extend

BRUVS – A NEW RESEARCH TOOL

previous AIMS work on productivity in the region and establish what links, if any, might exist between patches of high productivity food aggregations and the presence of whale sharks. Using various tagging devices provided by CSIRO, the study tracked daily movement and feeding behaviour of sharks from AIMS and CALM vessels, with results indicating the regular diving and surfacing movements which were likely to provide the sharks with an optimum searching pattern to home in on schools of plankton or baitfish. In addition to developing new insights into the ecology of the whale shark, the team successfully tagged one female shark with a satellite transponder that tracked the animal from WA waters to Christmas Island and beyond. The large, international scale movements of this species have clear implications for its long-term protection and conservation. See http://www.aims.gov.au/news/pages/media-release-20020708.html for more information.

NEW TOOLS TO ASSESS BIODIVERSITY

Developing methods to study fish populations provides challenges in sensitive areas where deep-water habitats are inaccessible to divers. The Conservation and Biodiversity Group has been developing and evaluating video tools, most notably Baited Remote Underwater Video Systems (BRUVs), that have potential to complement traditional trawling, trapping and hooking methods. The BRUVs can provide an effective yet non-destructive approach in areas, such as no-take zones of MPAs, where extractive sampling is unsuitable. Traditional fisheries research relies on size-frequency data, based on measuring the catch to reconstruct the dynamics of populations. These have, in the past, been unavailable from video records. In 2001-02, AIMS scientists and collaborators have made advances in refining stereo video algorithms to overcome this problem. AIMS, through collaborative research with University of Western Australia and others, tested the techniques in both tropical and temperate waters, and will use the tools in biodiversity surveys in the coming year.

COLLABORATIVE EFFORT DEVELOPS A 'BLEACHING' RESPONSE

Coral bleaching poses a threat to coral reefs as temperatures rise due to the enhanced greenhouse effect. Mass coral bleaching again affected large parts of the Great Barrier Reef in early 2002. Our knowledge of this event was greatly improved by experience gained from the 1998 mass bleaching event and extensive collaboration between organisations with

BLEACHED CORAL

complementary capabilities, which provided the basis for a more effective response to the latest bleaching event. The response incorporated regular monitoring of conditions on the GBR (from the Institute's Automatic Weather Station network and remote sensing unit); application of bleaching thresholds determined from experimental work; field observations; and knowledge of the 1998 event. Products such as 'hotspot' maps provided through collaboration between AIMS, GBRMPA and NOAA, were critical to this effort.

A draft Coral Bleaching Response Strategy provided to GBRMPA in late 2001 was almost immediately activated. From early December, daily updates of seawater temperatures (recorded by the weather station network) were compared with average daily water temperatures and were monitored against bleaching thresholds. Conditions conducive to coral 'bleaching' became apparent in early January and the response strategy was set in motion. This involved a request to researchers and the community to provide observations of bleaching back to the Authority and ongoing updates of water temperatures and bleaching thresholds by AIMS. Once several sectors appeared to be affected, a new methodology involving aerial and in-water surveys was used for the first time. As a result, the 2002 bleaching event on the GBR was monitored and documented in unprecedented detail. This helped to provide insights into the causes and consequences of mass coral bleaching.

LEARNING TO FORESEE CORAL BLEACHING

The Conservation and Biodiversity Group has started a study of the signals emitted when corals bleach. The project – supported by The Nature Conservancy and Packard Foundation – draws on AIMS research strengths. Daily satellite records of sea-surface temperatures for the heat-wave summer of 2002 were computed for the entire Great Barrier Reef and used to map hotter and cooler parts of the Great Barrier Reef. An ecological team used the maps to systematically determine the locations, species composition and local topographic settings of coral communities that were impacted to varying levels by coral bleaching. Samples of corals and their symbiotic algae were systematically collected to investigate the extent of any genetic basis for resistance to coral bleaching. Preliminary results are promising, with implications for zoning within the Great Barrier Reef and coral reef areas elsewhere to be investigated.

RESEARCH OUTPUT AT A GLANCE – CONSERVATION AND BIODIVERSITY

- The largest-ever survey of coral bleaching on the Great Barrier Reef was conducted over the summer in early 2002 (incorporating both aerial and underwater observations). This followed implementation of the Coral Bleaching Response Strategy.
- The Conservation and Biodiversity Group convened an international workshop on satellite oceanography and coral bleaching on Magnetic Island in January 2002.
- A model to explain patchy sea surface temperatures found on satellite imagery was successfully tested and forms the basis of the world's first coral bleaching risk map.
- *Long-Term Monitoring of the Great Barrier Reef Status Report No.5* was published in December 2001 and showed increased outbreaks of crown-of-thorns starfish on reefs in the Cairns, Innisfail and Townsville regions. There were also outbreaks in the Swains.
- Specimens of deep-water marine life were collected from seabed biodiversity exploration on the continental slope in north-west Australia, as part of a collaboration on biodiversity with Woodside Energy.
- A variety of video tools were developed for use in both habitat-mapping and fish community studies. Trials of Baited Remote Underwater Videos (BRUVs) demonstrated their use as research tools in sensitive habitats, in both tropical and temperate waters.
- Funding from FRDC, CALM, Esperance Port Authority and a host of other community organisations supported a project characterising fish habitats of the Recherche Archipelago. The project documented juvenile gummy shark nurseries, as well as extensive deep reef and sponge gardens, and again showed the utility of the BRUVs technique in temperate habitats.
- Long-term monitoring surveys continued at the Rowley Shoals and Scott Reef, and extended the database over 7-8 years. During this period, the Rowley Shoals monitoring sites revealed disturbance from tropical cyclones, while Scott Reef was evidently affected severely by coral bleaching in 1998.
- Several large *Porites* colonies were excavated from the Nelly Bay harbour redevelopment on Magnetic Island. These were retrieved for AIMS by 10 Force Support Batallion. They will provide a unique "snapshot" of mid-Holocene coral growth, river runoff and other climatic parameters in the vicinity of Townsville, for comparison with current and projected future climate and environmental changes.
- The World Atlas of Coral Reefs, drawing on AIMS data, was launched in Sydney.
- A plain-language manual (entitled *Coral Reefs, Mangroves and Seagrasses: A Sourcebook for Managers)* was published to assist in integrated coastal management and is in high demand for training courses in developing countries (Talbot F, Wilkinson C (2001).

COASTAL PROCESSES

Output from the Coastal Processes Group in 2001-02 stemmed from research undertaken around the tropical coast of Australia and the Asia-Pacific region. The complexity of physical and ecological processes in these coastal ecosystems requires a multidisciplinary approach and the Institute has strategically developed its capability to address problems in the coastal zone and their extension to ecosystems offshore. A synergistic merging of biology, chemistry, and physics underpins this knowledge base, directed towards the needs of stakeholders, particularly coastal industries and marine resource managers. Economic viability can only be maintained if development is sustainable; therefore changes in coastal ecosystems need to be understood to differentiate natural from human-induced impacts.

LEADING DEBATE ON WATER QUALITY

In 2001-02, the Group invested substantially in research on the enhanced runoff of sediment and nutrients from agriculture and coastal development, and its impact on water quality and marine food webs. AIMS is at the forefront of the water quality debate, with an AIMS publication *Catchments and Corals* in production. The potential impact of enhanced runoff beyond the coast is being gauged by development of practical models that predict sediment loads and identify bioindicators of excess nutrients. The unique data underpinning this work has informed the Great Barrier Reef Marine Park Authority in the development of its *Water Quality Plan,* which sets targets for reducing runoff into the reef. The crucial role of mangroves in absorbing carbon, nitrogen, phosphorus and other elements, thereby acting as "pollutant" filters, is also a core interest of the Group. Mangroves may act as carbon sinks.

A complementary research strand has been the development of real-time models of water circulation for the area between the Whitsundays and Lizard Island. Obtaining real-time data using oceanographic buoys has proven more difficult than expected, with redesign required to overcome failures in the data collection system. When linked with computer models determining the flow of water-borne materials on the Great Barrier Reef, the inter-connectivity between fish populations and sediment, wind and wave dynamics becomes apparent. The impact of fine sediment layers on ecosystems, coupled with the migration of particles from coastline to offshore, is a relatively unexplored phenomenon that helps explain the forces shaping marine ecosystems. Slow currents from the Coral Sea are a major transport mechanism on the Great Barrier Reef. Likewise, AIMS scientists have developed particle transport models for the Exmouth Gulf to explain enhanced productivity of fisheries

PLUME FROM THE DAINTREE RIVER
[PHOTO: GBRMPA]

larvae and plant and animal colonisation. The predictive ability of these models will assist resource managers and policymakers to develop the economy in our coastal regions.

IDENTIFYING INDICATORS OF ENVIRONMENTAL STRESS

Public debate on water quality in the Great Barrier Reef World Heritage Area has prompted the Group to search for problem zones along the Queensland coast and early indicators of harm to marine communities. Preliminary results indicate that estuarine communities close to catchments with significant agricultural development (i.e. in the Johnstone and Herbert Rivers) may be more stressed compared with those in remote areas (i.e. Cape York). Biomarkers are now being sought to build an early warning system for environmental degradation, ensuring that resource managers can avoid crossing the threshold of lethal stress. Barramundi appears to be a sensitive indicator species. Monitoring of changes using chemical signals emitted by marine organisms, whether due to natural or human-induced effects, helps managers to make proactive decisions. AIMS petroleum and plant-oil eco-toxicology research has revealed differences in the toxicity of these compounds to reef and coastal organisms. This is significant given marine traffic and growth in tourism on the Australian and SE Asian coasts.

Complementary to this research into biomarkers is work on active compounds and constituents in mangroves and fish. Studies on fish scales and ear bones have identified "chemical tags" useful in determining historical fish habitats and migratory patterns of fishes living in coastal creeks and lagoons, important in gauging influences on their life cycles.

FOLLOWING OIL IN THE TIMOR SEA

Studies on hydrocarbon and groundwater seafloor seeps in the Timor Sea, around huge algal mounds known as *Halimeda*, represent an exciting new direction for the Group. The first exploratory cruise was conducted in June 2002, funded by the National Oceans Office. The rich hydrocarbon reserves of the Timor Sea are the subject of much public discussion as their development is of great economic value. Natural seepage of these hydrocarbons and their relationship to biodiversity and *Halimeda* formations will illuminate our knowledge of ecological processes, potential impacts of oil and gas exploration, and marine carbon sources and sinks.

MAINTAINING A STRONG PRESENCE IN WA

The high biological productivity of the Exmouth Gulf region was investigated in an ongoing study by the Group, given the importance of the prawn industry to the area. AIMS has developed an improved understanding of food chains supporting these fisheries. The influence of the Leewin Current and aggregations of whale sharks near Ningaloo Reef have been key factors in identifying areas of high productivity. This information is crucial to guide and manage regional eco-tourism, prawn harvesting and coastal development. Also in northern WA, the proposed development of the Ord Dam stage 2 prompted AIMS research into possible impacts on the Ord-Bonaparte and Cambridge Gulf ecosystems. Studies showed major siltation of the Ord River estuary as a result of human impact. Scientists have now established mangrove plots in the Cambridge Gulf to detect long-term changes from dams.

PROMOTING SUSTAINABLE DEVELOPMENT

Because it is often necessary to encompass upland freshwater ecosystems and offshore environments when investigating coastal processes, the geographical reach of the Group's activities is extensive. Most human settlement in Australia and Asia occurs within 50 kilometres of the coast, thus research priorities have been influenced by issues such as income security and food production as well as greenhouse gas emissions and sea level rise, all acutely felt in the coastal zone. External funding has enabled the Group to use its knowledge base to help build more sustainable coastal industries (e.g. aquaculture, food production) in southern China and Vietnam. China's rural regions are contributing to pollution of waterways and coastal areas through reliance on agricultural chemicals. AIMS scientists, backed by industry and government partners, gained initial funding of $213,400 to develop a program demonstrating how to manage resources (water and wastes) in a sustainable way, leading to better economic returns. AIMS scientists aim to develop a model for sustainable production in Asia that can be sold to the World Bank and national governments. Technology arising from the project (i.e. recycling wastes) will have wide commercial applicability.

In Vietnam, AIMS scientists are investigating factors controlling yields of shrimp and wood from shrimp farming-mangrove forestry systems in Ca Mau Province, evaluating cost-effective technologies to improve production and farm income. In this way, they are enhancing Vietnam's capacity to address research and development issues in land use, aquaculture and mangrove forestry in coastal areas. Aquaculture farm trials show that simple, low-cost changes to farm and pond designs, better techniques for selecting good-quality seed and improved pond management can increase black tiger shrimps survival from less than five per cent to up to 40 per cent.

AIMS scientists are also doing research in the Gulf of Papua, particularly through an international collaboration known as Tropical River/Ocean Process in Coastal Settings (TROPICS).This group integrates physical, geological, chemical and biological oceanography, and involves scientists from Papua New Guinea, Indonesia, Australia and the United States. In 2001-02, TROPICS investigated how the mangroves and inshore zone of the south and west coast of PNG manage to trap most of country's river runoff. The amount of water and sediments delivered annually by New Guinea rivers ranks among the top 20 in the world.

RESEARCH OUTPUT AT A GLANCE – COASTAL PROCESSES

- The impact of runoff beyond the coast was gauged by developing practical models that predict sediment loads and identify bioindicators of excess nutrients.
- Soft coral diversity and changes in coral recruitment were identified as indicators of stress in marine communities in the Great Barrier Reef World Heritage Area. These community indices help to build an early warning system for environmental degradation.
- A novel method was developed to estimate limits to sustainable wood production and ecosystem support for harvesting of mangrove forests in SE Asia.
- Aquaculture farm trials in southern Mekong Delta improved production of black tiger prawns. Training manuals were produced in English and Vietnamese.
- Real-time models of water circulation were developed for the Great Barrier Reef continental shelf between Whitsunday and Lizard Islands.
- A large-scale eco-hydrological computer model was developed to predict reef degradation.
- Tidal motion studies identified localised regions of enhanced water-column mixing in the Exmouth Gulf, Western Australia. This confirmed the role of deep-sea upwelling in delivering nutrient-rich water that fuels biological productivity.
- A study of siltation the macro-tidal Ord River estuary in WA was completed and showed the level of human impact.
- Indicator signals for sub-lethal physical and chemical stress in test organisms were validated.
- Degradation studies of plant-based and petroleum-based lubricating oils in reef and mangrove organisms indicated plant-based lubricants are more degradable. However, plant-based 2-stroke oil was found to be significantly more toxic to the mangrove, *Avicennia marina*, than its mineral-based counterpart.
- A new automated analyser was commissioned to determine low-level nitrogen concentrations in water-borne suspended matter and coral reef sediments.
- A habitat restoration study showed weed-clearing in a coastal lagoon was followed by rapid colonisation by freshwater fish.
- Work on using chemical signals in fish ear-bones and fish scales to determine historical fish habitats and migratory patterns, was greatly advanced.
- New research began on relationships between hydrocarbon seeps in the Timor Sea and huge mounds of seaweed known as *Halimeda*. The focus is on geochemical processes, potential impacts of oil and gas exploration, and climate change.
- New externally funded research begins in China on managing resources in a sustainable manner leading to better environment and economic return.

MARINE BIOTECHNOLOGY

The Marine Biotechnology Group leads in the adoption of integrative strategies for the sustainable use and protection of marine resources, detailed most recently in the Review of Marine Research in Tropical Australia (July 2001). Priorities in 2001-02 were improving production and culturing new targets for global markets, tapping genetic resources for new pharmaceutical and healthcare products, trialing marine compounds effective as agrichemicals for crop protection, and developing bioremediation agents for environmental protection.

The Group strives to achieve a balance between applied research geared toward commercial applications, and basic research centred on preserving marine biodiversity and the environment. In this capacity, it contributed to international forums and the national agenda to develop Commonwealth and State policies on access to biodiversity and benefit-sharing. In September 2001, the Group also provided habitat information and collection inventories from southern Australian sites to the National Oceans Office *Uses Assessment* for the development of the Southeast Regional Marine Plan. The Institute's ability to generate industry from biodiversity was recognised in the *Queensland Biodiscovery Policy Discussion Paper* (April 2002). See *Policy Input* on p. 58 for more information.

DEVELOPING AQUACULTURE TECHNOLOGIES

Tropical aquaculture output focused on prawn domestication and genetics, the culturing of new targets including lobsters and sponges, and advising industry on production. The Tropical Aquaculture Project succeeded in a consortium bid with two divisions of CSIRO and the Queensland Department of Primary Industries for a $5.5 million project funded by the Fisheries Research and Development Corporation (FRDC) and Industry, looking at *Understanding and removing the barriers to Penaeus monodon domestication*. AIMS benefits by $378,000 for infrastructure and operating costs over three years. This collaborative research program is the largest of its kind in history and brings together industry partners and the four major agencies conducting research in tropical aquaculture. It is receiving major support from the Australian Prawn Farmers Association (APFA) and leading farm enterprises.

The Institute's contribution in developing a prawn broodstock management policy has also gained industry backing from the APFA and Queensland Fishing Industry Development Council, and the provisional patent *Induction of spawning in Crustacea* has progressed to a national-phase application.

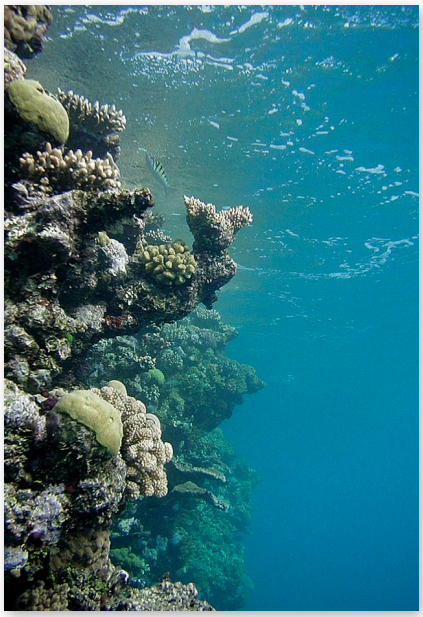
DRS CHERIE MOTTI AND DIANNE TAPIOLAS CHECK FOR ANTIBIOTIC ACTIVITY

The sea-ranching of sponges for fine chemicals and fibres (e.g. collagen for bone and wound healing, cosmetics, bath sponges) attracted community interest in 2001-02. Scale-up research was undertaken with support from FRDC and the Queensland and Western Australian Governments. Outcomes indicate production technologies are sustainable and economic. Queensland-based research was successful, moving to full external funding with $80,000 confirmed from the Department of Aboriginal and Torres Strait Islander Policy and the Great Barrier Reef Research Foundation. Research on sponge aquaculture in Western Australia funded by FRDC ($352,000 over two years) was completed with two species identified as aquaculture targets. The compounds from these species have been placed on the U.S. Food and Drug Administration register for clinical trials with the National Cancer Institute. AIMS is positioned to capitalise on this development, but lack of a biodiversity access agreement with Western Australia has hindered efforts to develop a viable aquaculture industry for the supply of these drug leads in that State.

SCIENTISTS LOOK FOR USEFUL COMPOUNDS

The search for bioactive molecules from the marine environment continues to bear fruit. The Institute maintains a comprehensive and diverse collection of Australasian marine biota curated with a growing informatics database; this provides the framework for the discovery of active compounds with commercial application and scientific value. In 2001-02, more than 8,000 marine macro-organisms were tested for antibiotic activity against *E. coli*, and the search is being extended to screen for anti-infectives against *Staphylococcus aureus* and *Candida albicans*. Additionally, a project with James Cook University funded by Nufarm Limited, the world's ninth largest agrichemical company, advanced discoveries of a novel herbicide to the glasshouse testing stage, thus achieving a milestone in the transfer of Intellectual Property to industry. Nufarm reported in 2001: "Preliminary results are very encouraging. The most promising candidate molecules so far identified are in synthesis development at Nufarm's French laboratories and indicate that these organisms could be a rich source of novel crop protection products."

AIMS continues to host the Australian Research Network for Algal Toxins (ARNAT) which brings together more than 100 researchers in Australia, New Zealand, Canada and the US.



CORALS' GENE FLOW INVESTIGATED

GENETICS RESEARCH AIDS RESOURCE MANAGEMENT

Genetics is used at AIMS to understand the evolution and maintenance of marine biodiversity. In the project *Genetics for Bioresource Management and Ecology*, a range of DNA traits were studied in 2001-02 to understand reproductive connections between populations, genetic diversity within marine populations, and the processes leading to this diversity. The use of biotechnology in this manner aids the design and management of Marine Protected Areas. For example, genetic data reveals that cross-fertilisation between coral species is important on an evolutionary timescale, but occurs infrequently in common corals of the genus *Acropora*. Hence, the effects of this cross-fertilisation are negligible and most species are distinct genetic entities. Population studies on commercially fished holothurians (sea cucumbers or *bêche-de-mer*) highlighted the need to consider gene flow (genetic exchange between populations) in planning biodiversity protection. Research found that one species with unrestricted gene flow between populations can be managed over large scales, whereas another species with a restricted gene flow requires protection of local populations. A forensic method was developed for identification of specimens to determine growth and migration rates, and this technique is amenable to other species for future conservation planning.

Scientists at AIMS are also using molecular indicators to quantify variations in heat stress responses of coral species during bleaching episodes on the Great Barrier Reef. Like other organisms, corals produce heat shock proteins for protection, and these proteins indicate to scientists the degree of heat stress experienced. In 2001-02, scientists discovered that *Acropora millepora* coral from an inshore reef was more able to produce these protective proteins and can withstand heat stress more than specimens living on an offshore reef. This thermal tolerance is also correlated with the strain of symbiotic algae or *zooxanthellae* living in the coral tissue. Results suggest the ability of corals to associate with different strains of symbiotic algae may contribute to their susceptibility to coral bleaching.

DR ANDREW NEGRI IN ANTARCTICA

NATURE'S DEFENCES OFFER NEW POSSIBILITIES

The search for new biochemicals is complemented by examining adaptations of marine organisms to harmful or aggressive environments resulting in the production of biotoxins and venoms, antifoulants, signalling agents, and other molecular defences. Understanding the functioning of these agents provides a strategy for the discovery of new and useful products.

In 2001-02, the discovery of a novel response by marine bacteria to ultraviolet radiation prompted new research aimed at shedding insight into celllular processes of human ageing and the design of therapeutic controls to retard degenerative processes. Marine bacteria isolated from the mucus of shallow-water corals have a biochemical adaptation that enhances the recycling of coenzyme Q (CoQ) in their metabolism. In human health, CoQ is vital to energy production and antioxidant balance. AIMS research into CoQ production by marine bacteria won support from the Australian Academy of Science and the Japan Society for the Promotion of Science. The Institute is now collaborating with the University of Tokyo and the Osaka City University Medical School to take this research to the next level.

In a similar vein, collaboration with the University of Canterbury and logistic support from Antarctica New Zealand underpinned AIMS research into human impacts on Antarctic sponges. The seabed environment of the Antarctic shelf under ice is dominated by sponges which filter hundreds of litres of seawater per hour, making them ideal bio-indicators of pollution near areas of human occupation. Additionally, these animals harbour bacteria with potential to act as indicators of metabolic stress. AIMS researchers examined the effects of pollution on the sponges' biochemistry and the bacteria they host. This collaboration succeeded in gaining second-year funding from Antarctica New Zealand and is now attracting the interest of environmental management agencies. It provides a novel opportunity to examine tropical-polar extremes in comparative physiology, environmental biochemistry and the functional ecology of marine sponges.

RESEARCH OUTPUT AT A GLANCE – MARINE BIOTECHNOLOGY

- Start-up company ToxiTech Pty Ltd established with major focus on biotechnological solutions for quality management of seafood toxins and drinking water.
- Discoveries of novel marine herbicides advanced to glasshouse testing stage.
- Major consortium bid succeeded in launching $5.5 million project looking at *Understanding and removing the barriers to Penaeus monodon domestication*.
- Discovery of a novel response by marine bacteria to ultraviolet radiation prompted new research aimed at shedding light on human ageing and design of therapeutic controls to retard degenerative processes. International collaboration will help take this discovery to next level.
- AIMS contributed to bioinformatics database for new CD-ROM on Cleveland Bay, Townsville.
- 8,000 marine macro-organisms tested for antibiotic activity against *E.coli*. This was the largest discovery effort in Australasia for such biological activity. Leads are now under investigation.
- DNA traits of marine organisms examined to inform design of Marine Protected Areas. Scientists shed insight on reproductive connections between populations, genetic diversity within marine communities, and the processes leading to their evolution.
- Population studies on commercially fished holothurians (sea cucumbers) highlighted need to consider gene flow in planning biodiversity protection.
- Molecular indicators showed heat stress responses differ among coral specimens. Scientists discovered adaptations of algae living in coral tissue to environmental change may be critical to coral bleaching.
- Scale-up research shows viability of developing sponge aquaculture for the extraction of fine chemicals and fibres.
- Research into human impacts on Antarctic sponges gained second-year external funding from Antarctica New Zealand and attracted interest of environment management agencies.
- Habitat information and collection inventories from Southern Australian sites were given to National Oceans Office.
- Group continued to provide major input to Commonwealth and State Policies on access to biodiversity and benefit-sharing.

RESEARCH SUPPORT

VESSEL CRUISES 'TOP END'

The Institute's vessel management contract was advertised nationally in January. A new contract with the preferred tenderer is scheduled to start in September 2002. The Institute's newest research vessel, the *RV Cape Ferguson,* was used on 22 expeditions in the Great Barrier Reef World Heritage Area during 2001-02, spending a total of 267 days at sea. From January to June 2002, the vessel cruised off the north coast of Western Australia, working in the Timor Sea, Indian Ocean and Exmouth Gulf. It steamed for a total of 18,955 nautical miles.

The *RV Lady Basten* was used on 27 research expeditions conducted in the Great Barrier Reef World Heritage Area. This research vessel spent 268 days at sea during 2001-02 and steamed for a total of 14,854 nautical miles. The smaller seacraft *RV Dorado* was relocated from Karratha to Townsville.

REVIEW OF DIVING PROCEDURES

The publication of new Australian/New Zealand Scientific Diving Standards in April 2002 resulted in a review of the Institute's current Diving Procedures.

In total, 106 dive plans were approved in 2001-02, with no incidents reported.

RV CAPE FERGUSON

IT DEVELOPMENTS

A new telephone system was installed in 2001-02 combining voice and data transmission over the same infrastructure, thus allowing the roll-out of services such as voice mail. This upgrade prompted improvements to the network, done in conjunction with the building's refurbishment. A new central server was installed, along with a back-up tape library.

CORAL BLEACHING NEWS CONFERENCE

The IT Section implemented secure high-speed connections to the AIMS Perth office using the Internet and encryption devices, to provide a service similar to that offered at Cape Ferguson. To compensate, the Internet link was upgraded to 2 megabits per second – a ten-fold increase in speed. The Institute also moved to outsource the supply and maintenance of personal computers, to allow more resources for supporting science. Security was a focus in 2001-02, with improved intrusion detection and virus protection procedures put in place.

DATA CENTRE CREATED

The AIMS Data Centre was created in July 2001 to ensure integrated data management. In its first year, it worked on improving administrative systems, including systems for managing financial reporting and staff publications. The Institute uses the World Wide Web to promote research output through this new publications database, searchable externally. The Data Centre also helped to develop a sea surface temperature atlas and a search tool for web-based identification of corals.

REFERENCE COLLECTION

Researchers at AIMS have access to reference material provided in electronic and printed form. Inflation and currency fluctuations have impacted on the buying power for scientific, technological and medical journals, leaving little margin for growth or changes in the Institute's core collection. The Institute took advantage of domestic and international library networks to procure research documents requested but not held. Document requests have fluctuated with the introduction of full-text electronic journals, but about 1000 requests were still recorded in 2001-02.

MEDIA COVERAGE DOUBLES

A stronger focus on marketing principles, relationship-building with media, and strategic alliances with other research agencies (e.g. CRC Reef, James Cook University and CSIRO Marine Research) helped the Institute to double its news coverage in 2001-02, with airtime and space valued at more than $400,000. Improved technology and in-house video capture and editing skills are also helping to overcome the challenge of being located so far from the main metropolitan media outlets.

A joint news conference in May 2002, announcing the results of coral bleaching surveys in the Great Barrier Reef World Heritage Area over the recent summer, proved the most successful news event of the year, attracting intense

RIVER LOGGER SYSTEM MEASURES WATER QUALITY

worldwide coverage. Other AIMS activities to attract media attention included climate change research, the discovery of bacteria with anti-ageing properties, new AIMS bases in Fremantle and Darwin, a research expedition to the North West Shelf, the conclusion of a study of sea cucumbers on the Great Barrier Reef, toxic tropical crabs, and the tagging of a whale shark at Ningaloo Reef. A forum on irukandji jellyfish at CRC Reef also led to exposure of AIMS toxins expertise. Film crews went to sea with AIMS scientists to shoot footage for documentaries on the runoff of nutrients and sediments into the Great Barrier Reef lagoon and Australian research into whale sharks.

DISPLAYS, TOURS AND WEBSITE

New AIMS exhibition panels were mounted at the 2002 North Queensland Field Days. Attendance by two scientists throughout the event ensured its success, with a story and photograph about the AIMS display appearing in the Townsville newspaper. In addition, 66 public tours were held at the Cape Ferguson laboratories – eight more than the previous year. Nearly a quarter of a million visitors have toured the Institute since 1988.

The AIMS website continues to gain popularity and is used increasingly by teachers, students and journalists as a common point of reference on marine issues. The webpage *ProjectNET for Schools* has had 149,102 hits since May 1998 and, in a similar vein, the *AIMS News* webpage attracted 22,880 visitors from January 2001 to June 2002. The Institute produced a special five-minute 'reality science' video featuring one of its oceanographers, after a request via the internet from a school in the United States.

INNOVATIVE RESEARCH TOOLS

AIMS engineering services staff have developed a computerised board for recording underwater observations, enabling faster, more accurate monitoring of reef communities. Dubbed the "bat board", this prototype manta logger underwent sea trials in 2001-02 with research divers from the AIMS reef monitoring team. The manta logger is designed to allow an overlay of ecological information on Geographic Information Systems (GIS), tying broad-scale reef surveys to information gained from remote sensing, depth sounders and global positioning systems.

PAUL MILLERS WORKS ON THE NEW RADIOMETER

In the reporting year AIMS staff also completed the documentation of a river logger system for commercial licensing. This system measures water quality, fundamental to the health and function of coastal ecosystems.

Finally, AIMS engineers are helping Australian scientists lead in high-accuracy climate research. In 2001-02 they designed and built a radiometer which upgraded equipment previously installed on a Townsville tourist ferry; it captures infrared radiation given off by the sea. This information is converted into sea surface temperatures and the data fed via mobile phone to the Institute's Cape Ferguson laboratories.

The radiometer calibrates similar data recorded by orbiting satellites and is useful to organisations such as the National Oceanic and Atmospheric Administration in the United States, as well as Australian scientists studying coral bleaching.

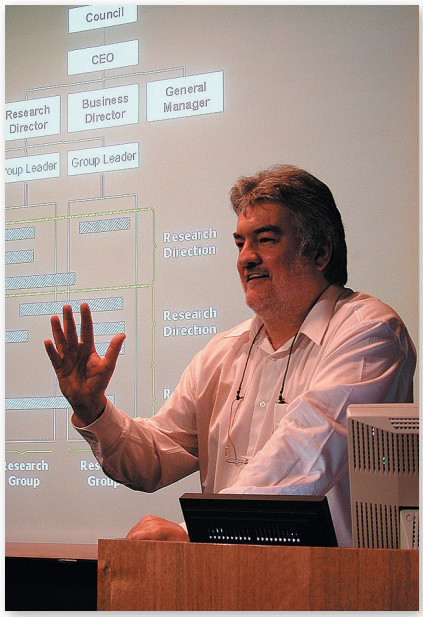
BUSINESS DEVELOPMENT

'The Institute has embarked on a significant new direction in the transfer of AIMS technologies via equity-building vehicles.'

Dr Peter Isdale

The Institute's commercial activity includes contracts, consulting, licensing and business spin-offs, within the broad field of marine and coastal applications. It acknowledges the growing importance of science and innovation in national wealth creation, particularly regional development. In the year under review, the Institute proved an incubator of new business and a significant contributor to the regional economy. In particular, through collaboration with industry and government partners, we provided new opportunities for North Queenslanders to gain competitive advantage in developing new technologies.

Business Director, Dr Peter Isdale reported a significant new direction in the transfer of AIMS technologies via equity-building vehicles (or spin off companies). In 2001-02, AIMS collaborated with James Cook University in the establishment of a spin-off company called ToxiTech Pty Ltd (A C N 096 646 310) to capitalise on a joint development by the two institutions relating to a unique technology for measuring the content of harmful algal-derived toxins in seafood and drinking water.



DR PETER ISDALE

The Institute's use of this spin-off method contrasts with previous technology transfer arrangements, which were generally achieved through licensing AIMS' inventions to non-

subsidiary vehicles. AIMS has previously invented, protected and licensed technology to others for long-term but modest return. The development of spin-off enterprises that manufacture and sell products derived from research provides employment and (usually) high value exportable commodities. For example, ToxiTech, which commenced its first round of capital-raising prior to 30 June 2002, is a Townsville-based company now establishing a local production and distribution facility.

REVIEW OF COMMERCIALISATION

During 2001-02, the Institute contracted Julian Clark Consulting Pty Ltd to undertake a review of AIMS commercialisation policies and practice. The report was considered by the AIMS Council at its Darwin meeting on 26 June 2002.

The report concluded that, while AIMS was maintaining its competitiveness in the Australian context, there was room for improvement in managing and transferring intellectual property, and enhancing the recognition of commercialisation as a desirable outcome of research. The implementation of many Clark recommendations is underway.

CHANGES TO AIMS ACT

During the reporting year, significant amendments were proposed to the AIMS statute in the form of the *Research Agencies Legislation Amendment Bill 2002,* introduced to the Parliament.[10]

These amendments were sought in order to provide the Institute with statutory clarity on the powers that it requires to use new models of technology transfer in its activities. For example, under the proposed amendment, AIMS will have the power to borrow and the power to lend to its significant subsidiaries, subject to the appropriate Ministerial approvals. This will enable the Institute to seed its own significantly-held spin-off companies, and to enable those entities to undertake normal commercial transactions.

The Institute's powers and functions currently extend only to those matters classified as marine science and marine technology. Under the proposed amendments, AIMS will be permitted to develop non-marine applications from marine discoveries and *vice versa.* This will allow the search to be undertaken for non-marine applications, such as the development of terrestrial herbicides from marine extracts, without limitation to our commercial interests.

For information on patents and technology transfer see *Research Output and Community Outcomes.*

[10] *Hansard, House of Representatives*, 27 June 2002, pp. 3797-3810

CORPORATE OVERVIEW

Role, Legislation and Minister

Mission, Vision and Values

Organisation and Staffing

Output and Outcome Structure

Corporate Governance

Public Accountability

Key Management Events

Infrastructure Development

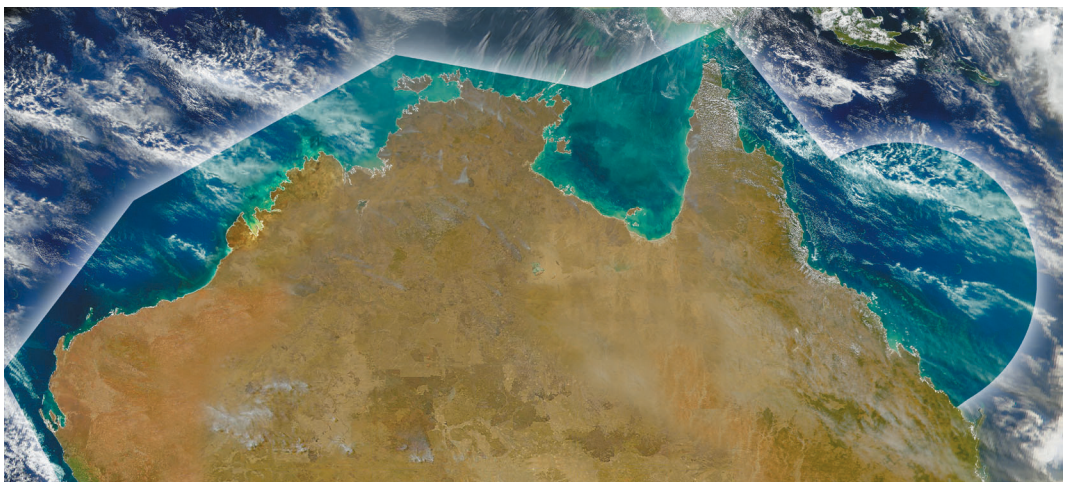
ROLE, LEGISLATION AND MINISTER

The Australian Institute of Marine Science (AIMS) is a Commonwealth statutory authority established by the *Australian Institute of Marine Science Act (1972).* Its primary role 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 marine research and development. (See Appendix 1 to learn more about the Institute's legislative foundation, functions and powers.)

On 27 June 2002, significant amendments were proposed to the AIMS statute, in the form of the *Research Agencies Legislation Amendment Bill 2002,* introduced to the Parliament. See 'Business Development'.

LOCATION

The Institute's main facility is at Cape Ferguson, 50 kilometres from Townsville. This location puts AIMS near the geographic centre of Australia's most treasured marine resource, the Great Barrier Reef. In 2001-02, the Institute established new bases in Darwin and Fremantle to support research in the north-west and north of Australia, and supplement research undertaken at Cape Ferguson.



GEOGRAPHIC RANGE OF CRUISES BY AIMS VESSELS

THE MINISTER FOR SCIENCE, THE HON PETER Mc GAURAN

Since the main laboratories opened in 1977, AIMS researchers have built international reputations in three broad areas of science – marine biodiversity and conservation, coastal processes, and marine biotechnology.

Two research vessels *RV Cape Ferguson* and *RV Lady Basten* log an average of 250 days at sea each year, plying the tropical waters off Queensland, the Northern Territory and Western Australia. A range of smaller vessels supports fieldwork near-shore and offshore.

The Institute falls within the Department of Education Science and Training, and reports to the Minister for Science, the Hon Peter McGauran MP. In the previous Parliament (first half of year in review), the Institute reported to the then Minister for Industry, Science and Resources, Senator the Hon Nick Minchin.

MISSION, VISION AND VALUES

During the reporting year, the Institute's Mission, Vision and Values Statements were reviewed and revised, with input from staff. This was completed in November 2001 and approved by Council.

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.

VISION

To lead marine research in our chosen fields and to deliver greater benefits and value to Government, our partners, our customers and the general public than they can obtain from others.

- "To lead" connotes excellence and pre-eminence in marine science.
- "Chosen fields" tempers that ambition with a dose of realism by recognising the need for us to be focused in our choice of research directions.
- The second part of the statement ties into our mission and stresses our intention to ensure that the knowledge we generate leads to beneficial outcomes and is viewed as having high value, in terms of both cost-effectiveness and quality.
- Mention of "partners" identifies us as an organisation that values collaboration, while using the words "customer" and "general public" recognises us as a provider of both targeted and public good research.

MISSION STATEMENT IN AIMS FOYER

TEAMWORK FOSTERED

VALUES

1. Our talents and creativity are the foundations for excellence.
2. The behavioural values we adopt and the way we work together is a key to high achievement.
3. Excellence requires a technically superior, supportive workplace that fosters personal development, teamwork and professionalism.
4. We must continually strive to be at the leading edge of scientific inquiry, generating new knowledge to solve both fundamental and applied problems.
5. Our commitment to the effective transfer of knowledge, benefits and value must be total and we shall use the judgement of Government, our partners, our peers, our customers and the general public to measure our performance.

ORGANISATION AND STAFFING

The Institute's science base was reorganised in 2001-2002 into three Research Groups, across which 18 interdisciplinary research projects were conducted. The Research Group is now the fundamental unit for science strategy development, marketing, relationship management, co-ordination of science delivery and reporting.

The total staff employed by AIMS during the 2001-2002 reporting period was an equivalent full-time value (ie staff years) of 150.4 which includes casuals.

Compared with 154.7 for 2000-2001, this represents a further reduction in staff numbers which have fallen by 14.06% since the 1996-1997 reporting period.

All members of staff are employed under the *Australian Institute of Marine Science Act 1972* (amended 1992). In addition to those paid from appropriation funding received from the Federal Government, the Institute employs staff periodically on projects funded by external sources, such as industry.

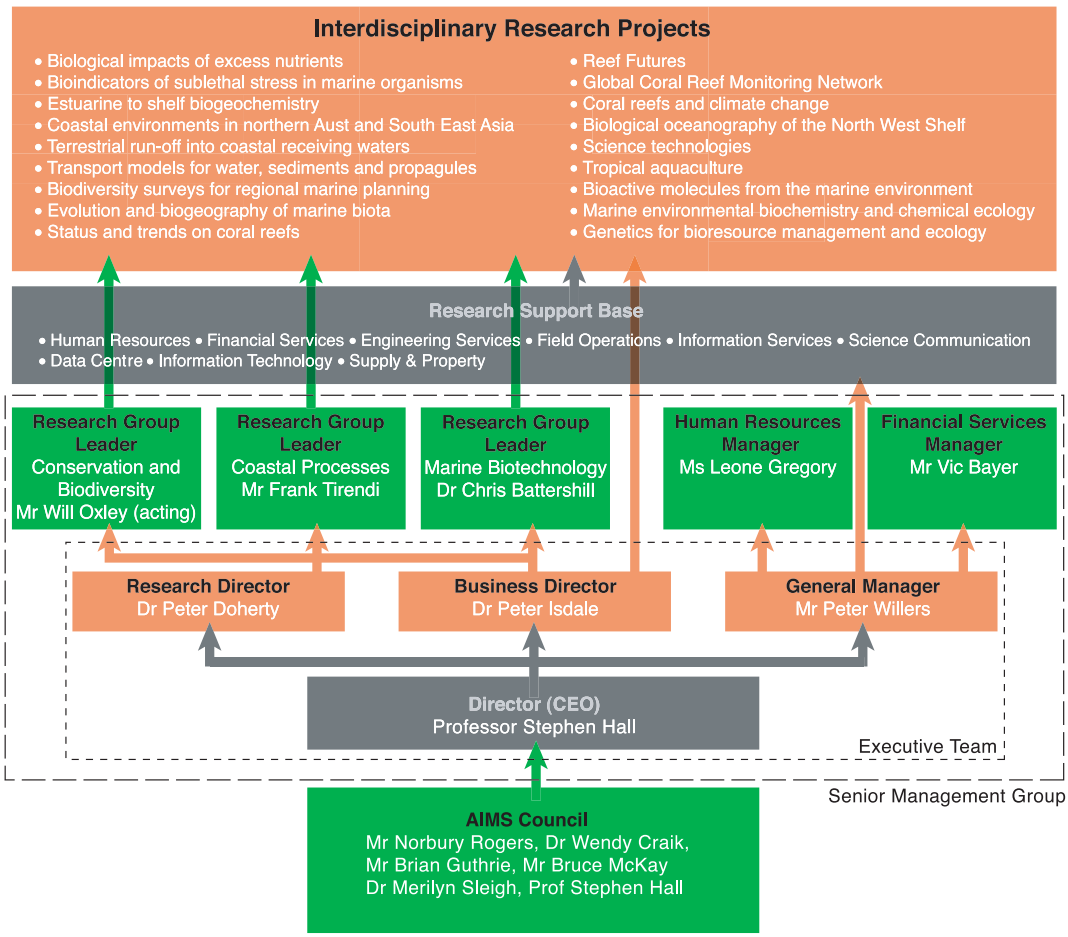
The following chart provides a breakdown of staff numbers.

STAFFING OVERVIEW AT 30 JUNE 2002

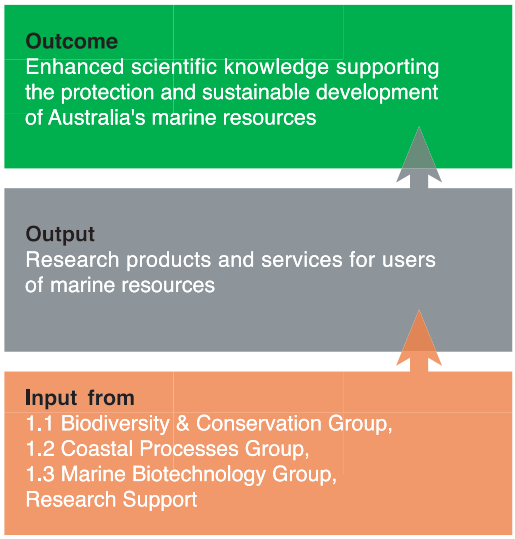
	Female	Male	Total
Science	28	64.7	92.8
Corporate	11.0	8.0	19.0
Support	9.9	28.8	38.6
Total Staff	48.9	101.5	150.4

Aboriginal & Torres Strait Islander	0.6%
Non English speaking background	6.0%
Staff with a disability	7.0%
Women	36%

ORGANISATIONAL STRUCTURE AT 30 JUNE 2002



OUTCOME AND OUTPUT STRUCTURE



EXPLANATORY NOTE:

Output is defined as "the goods or services produced by agencies on behalf of Government for external organisations or individuals. Output include goods and services produced for other areas of Government external to an agency". Outcomes are defined as "the results, impacts or consequence of actions by the Commonwealth on the Australian community [which must be] consistent with those listed in agencies' portfolio budget statements and portfolio additional estimates statements". (Source: Department of Prime Minister and Cabinet, *Requirements for Annual Reports,* June 2001)

CORPORATE GOVERNANCE

The corporate governance of AIMS is the primary framework underpinning the organisation's structures and processes. Through this governance framework, the Institute meets its responsibilities to the Minister for Science, the Hon Peter McGauran MP and to the Government and people of Australia, ensuring that it develops knowledge for the management of Australia's vast coastal and marine resources. Over the past year, the Institute has reviewed the implementation of principles of corporate governance through its Organisational Improvement Plan. This effort has been designed to promote better performance, accountability, transparency and behaviour. It has involved the AIMS Council, management and staff, who are committed to fulfilling the Commonwealth's policy of caring for Australia's ocean territory and assisting stakeholders to use marine resources wisely.

COUNCIL

AIMS is a Commonwealth Statutory Authority formed by the *Australian Institute of Marine Science Act 1972.* Its strategic priorities are determined by the AIMS Council and by Government policies and decisions. Council Members are Mr Norbury Rogers A.O. (Chairman), Mr Bruce McKay (retired 30 June 2002), Dr Wendy Craik, Dr Merilyn Sleigh, Mr Brian Guthrie and AIMS Director and CEO, Professor Stephen Hall. Non-voting observers at meetings include Research Director Dr Peter Doherty, Business Director Dr Peter Isdale, and General Manager Mr Peter Willers. The Council meets four times a year.

MEMBERS

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

Term 30/7/98 to 30/6/2003

Mr Norbury Rogers A.O. is a Chartered Accountant and Company Director and is a Senior Consultant to Ernst and Young. He spent many years as Managing Partner and Senior Partner in Ernst and Young (and its predecessors). Mr Rogers holds a number of directorships. He is Chairman of Golden Casket Lottery Corporation Limited and UniQuest Pty Limited, and is a member of the Board of Business Management Limited. He has just completed a five year term as a member of the CSIRO Board. He has been a long-standing, active member and officer bearer of the Institute of Chartered Accountants in Australia and is also a member of the Senate of The University of Queensland and many associated committees.

Mr Bruce G McKay BSc (Hons), FIEAust, FAICD

Term 1/7/1997 - 30/6/2002

Mr Bruce McKay is a geologist with more than 30 years experience in exploration, production and management in the resources industry,

primarily oil and gas. He worked for Esso Australia and internationally with Exxon affiliates from 1968 to 1992. He is an Honorary Life Member of the Australian Petroleum Production and Exploration Association (APPEA) and was its Chairman in 1991-92. He was Director of Personnel at Telstra from 1992 to 1994 then Chief Executive of the Australian Graduate School of Engineering Innovation from 1994 to 1997. Currently, Mr McKay is the Non-Executive Chairman of Australian Worldwide Exploration Ltd and Omega Oil NL and a Non-Executive Director of Sydney Gas Company NL. He is also an executive coach with The Stephenson Partnership, an adjunct lecturer at the Macquarie University Graduate School of Management, and Chairman of the Management Board of the School of Petroleum Engineering and Management at the University of Adelaide.

Dr Wendy Craik BSc (Hons), PhD, Grad Dip M'ment, FTSE, FAICD
Term 1/7/1997 - 30/6/2004
Dr Wendy Craik brings to AIMS experience in public policy, environmental planning, executive management and research. She is Chair of the Australian Fisheries Management Authority. Previous roles have included Chief Executive Officer of Earth Sanctuaries Ltd (a publicly listed company specialising in conservation and ecotourism) and Chief Executive Officer of the National Farmers' Federation for five years. A fisheries biologist, she worked at the Great Barrier Reef Marine Park Authority for 17 years to 1995, the last three as the Executive Officer responsible to the Chair of the Authority. Dr Craik was responsible for coordinating the development and implementation of the 25 Year Strategic Plan for the Great Barrier Reef World Heritage Area. Currently, she is a councillor on the National Competition Council and a board member of the Foundation for Rural and Regional Renewal.

Dr Merilyn Sleigh BSc(Hons), PhD, Dip Corp M'ment, FTSE, FAICD
Term 30/7/1988 – 30/6/2003
Dr Merilyn Sleigh is Managing Director of the start-up 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, as well as 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 and a scientific adviser to investment group SciCapital. She is Deputy Chair of the Panel responsible for awarding $45 million under the Government' biotechnology Centre of Excellence scheme. Previously she held board positions with two CRCs, Unisearch Limited, and Food Science Australia. Prior to joining EvoGenix, Dr Sleigh was Dean of the Faculty of Life Sciences at the University of New South Wales.

Mr Brian Guthrie BEng, BEcon, MEng
Term 30/7/1998 - 30/6/2003
Mr Brian Guthrie brings to AIMS many years of experience in executive management in both the public and private sectors. He started his career at the Townsville City Council as an assistant engineer and gained experience in all facets of local government engineering. His last 10 years with the City Council were spent as

AIMS COUNCIL MEETING IN PROGRESS

Works Engineer. Mr Guthrie then moved to private enterprise with a major subsidiary of Brambles Pty Ltd and 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 taking up the appointment of Deputy Town Clerk and Director, Corporate Services with the Townsville City Council. For the past seven years Mr Guthrie has been the Townsville City Council's Chief Executive Officer.

Professor Stephen Hall BSc, PhD, GAICD (Director and CEO)
Professor Hall was Head of Fish Biology at the Scottish Office Agriculture, Environment and Fisheries Dept Marine Laboratory in Aberdeen, before taking up a position as Professor of Marine Biology at Flinders University of South Australia and Director of the Lincoln Marine Science Centre. In 2000 he took up his current position as Director and CEO of AIMS. He has published extensively on the structure and functioning of marine ecological systems, focusing on the effects of natural and human disturbance. This work culminated recently in 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. Previously, he was chairman of the International Council for the Exploration of the Seas (ICES) Working Group on the Ecosystem Effects of Fishing Activities. This group provides advice on fishing effects and other aspects of coastal zone management. Professor Hall has also acted as a consultant to the United Arab Emirates and the European Commission, and is a recent recipient of a Pew Fellowship in Marine Conservation.

Conflicts of interest

Members of the Council disclose their connections to other commercial entities such as boards and adhere to a policy of declaring actual or potential conflicts of interest as part of Council operations. This policy is consistent with the CAC Act (Section 21). In keeping with this Act and Institute policy, a Council member who considers that he or she has a material personal interest (direct pecuniary or indirect pecuniary) in a matter to be discussed by the Council, must declare the existence and nature of the interest, and then leave the meeting. The Council decides when to invite the absent Council Member back to the meeting. In the case of Council Members with a direct pecuniary interest, this is not until discussion on the matter is completed. Likewise, the

Council Attendance

COUNCILLOR	MEETINGS ATTENDED			
	10 Sept 2001 Townsville	19 Nov 2001 Townsville	11-12 March 02 Townsville	19 June 2002 Darwin
Norbury Rogers A.O.	√	√	√	√
Bruce McKay	√	√	√	√
Brian Guthrie	√	x	√	√
Wendy Craik	√	√	√	√
Merilyn Sleigh	√	√	√	√
Stephen Hall	√	√	√	√

Executive is obliged to declare actual or potential conflicts of interest in its deliberations.

AUDIT COMMITTEE

The Audit Committee is a committee of the AIMS Council whose role is to provide advice to the Council on the Institute's finances and governance. It comprises three Council members and one independent member, who oversee the Institute's audit strategy as well as reviewing and reporting to the Council on the Institute's accounting records. During 2001-02, the Audit Committee reviewed:

- Monthly reports
- Annual budgets
- Annual Financial Statement

Members of the Audit Committee in 2001-02 were Mr Bruce McKay (Chairman), Mr Norbury Rogers A.O., Mr Brian Guthrie, and Mr Robert Tardiani (CE Smith and Co, Townsville). The Institute's Finance Manager Mr Vic Bayer is Secretary to the Committee. General Manager Mr Peter Willers and Mr Mark Hayward from Ernst and Young act as non-voting observers.

INTERNAL AUDIT

The Council appointed Ernst and Young to carry out internal audits four times during 2001-02. The auditor's role is to monitor the procedures outlined by management and to make recommendations. The auditor reports to the Audit Committee four times a year.

EXTERNAL AUDIT

The Institute is subject to the *Commonwealth Authorities and Companies Act 1997*, whereby the Auditor-General inspects and audits the accounts and records of the Institute's financial transactions and assets. The Auditor-General then reports to the Minister and Parliament through the AIMS Council.

AUDIT COMMITTEE ATTENDANCE

COMMITTEE MEMBER	MEETINGS ATTENDED		
	30 August 2001 Townsville	27 February 2002 Brisbane	4 June 2002 Townsville
Bruce McKay	√	√	√
Norbury Rogers A.O.	√	√	√
Brian Guthrie	x	√	√
Robert Tardiani	√	√	√

SENIOR MANAGEMENT GROUP MEETING IN PROGRESS

EXECUTIVE TEAM

The Institute's Executive Team has four voting members and oversees all research and administration. It includes the Director and CEO Professor Stephen Hall; the Research Director Dr Peter Doherty; the Business Director Dr Peter Isdale; and the General Manager Mr Peter Willers. During 2001-02, the Executive Team was joined by five non-voting members – the Human Resources Manager Mrs Leone Gregory, the Finance Manager Mr Vic Bayer, and Research Group Leaders Dr Chris Battershill, Mr Frank Tirendi and (Acting) Mr Will Oxley. This larger body is called the Senior Management Group and meets on a monthly basis.

CORPORATE PLANNING FRAMEWORK

To ensure AIMS fulfils its mission and vision and thus delivers to the Commonwealth the agreed outcome, the Council defined a series of key performance goals during 2001-02 to be worked towards in the coming year. These goals will be met through the Organisational Strategy which outlines top-level strategic decisions such as the:

- Institute's geographic sphere of operations;
- Broad areas of research capability as reflected in the Research Groups (Biodiversity and Conservation, Coastal Processes and Marine Biotechnology); and
- Targets for the mix of appropriation, co-investment, commercialisation and contract research appropriate for the Research Groups.

The Corporate Strategy then defines the structure of people systems, the delegation of authority, and business systems that allow research output to be achieved.

PERFORMANCE MANAGEMENT

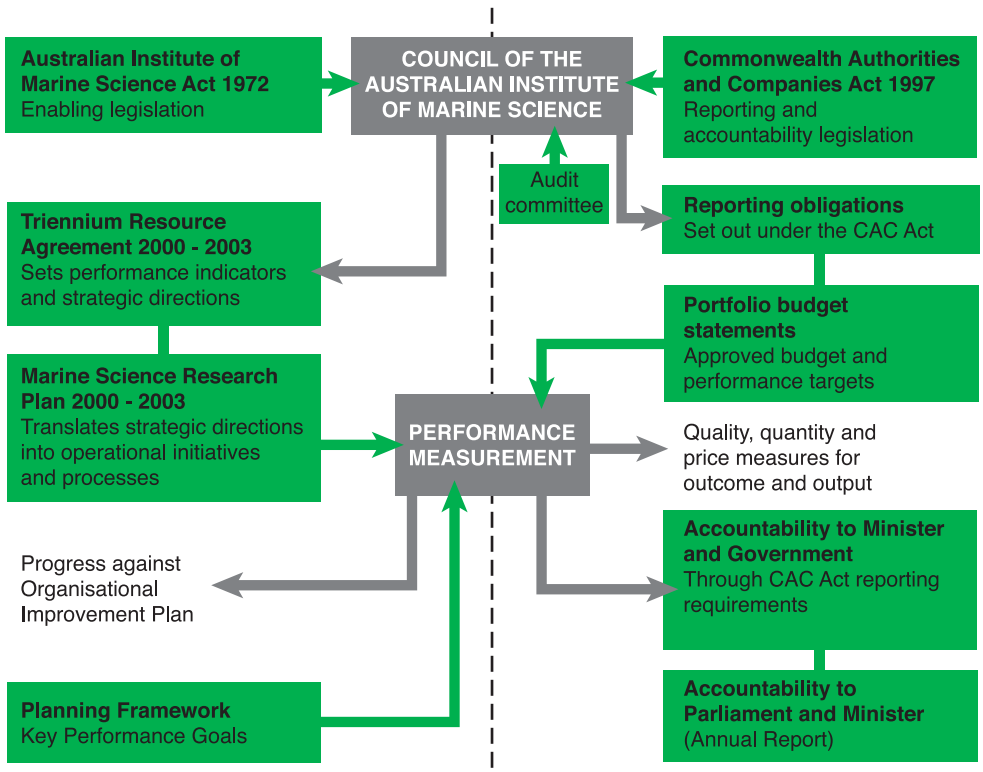
Two teams were formed in 2001-02 to address how 'Managing People and Performance' can be improved at AIMS. Staff volunteered to join the teams. The teams are to 1) develop a Position Classification System and 2) develop a Performance Management System. The teams first met in June 2002 to scope issues and define workplans.

The AIMS Council is expected to set policy and provide review, advice and direction to management. It undertakes a formal review of its performance each year, with each Councillor providing an independent evaluation on a range of criteria. In the light of this analysis, revisions to Council's communications strategy and an alternative approach to focusing on strategic issues were adopted during this reporting period. During the year, Professor Hall successfully completed the Australian Institute of Company Directors residential course, bringing to five the number of Councillors who are graduates or fellows of the AICD. Like AIMS staff, Council members undergo a comprehensive induction process at the time of appointment. This includes a briefing on the requirements of the CAC Act.

The Institute also has an ongoing program of evaluation which includes:

- The assessment and reporting of performance against objectives, performance measures and effectiveness indicators;
- The regular submission of research findings to external review by scientific peers;
- The critical assessment of patent applications; and

CORPORATE GOVERNANCE



- The annual cycle of staff performance planning and evaluation.

RISK MANAGEMENT

The Audit Committee of Council has responsibility for overseeing an integrated risk management framework. It takes into consideration: strategic/commercial risk and operational/compliance risk. A more explicit approach to identifying and managing significant business risks is now being achieved. For instance, Council commissioned Price Waterhouse Coopers to complete an *Organisation-wide Risk Assessment of AIMS* in May 2002. This also involved a Fraud Risk Assessment Questionnaire. This went to a broad range of staff, and was used to assess the current fraud control plan, and check effectiveness of current controls and address. The Assessment was preceded by a workshop for key staff, where risk management concepts and benefits were discussed. A risk-reporting mechanism is being developed and will be monitored. It is being aligned with business and personnel planning and performance processes.

FRAUD CONTROL

The Institute has a comprehensive fraud control plan that complies with the *Fraud Control Policy of the Commonwealth – Best Practice Guide for Fraud Control.*

This plan is integrated into the Institute's management system and internal audit process. It is reviewed and updated annually by the Audit Committee to ensure it remains relevant to the Institute's business.

INDEMNITIES AND INSURANCE PREMIUMS FOR OFFICERS

There were no known liabilities to any current or former officers. During the reporting period, no premium was paid (or was agreed to be paid) against a current or former officer's liability for legal costs. AIMS paid premiums for the Directors and Officers Insurances required under the CAC Act.

BEHAVIOUR

A number of organisational changes resulted from the Culture Benchmarking Survey undertaken in August 2001. These included:

- Training and handbook for all staff on "Bullying in the Workplace". This training provided information and examples on how to conduct workplace business in a non-bullying manner, and also how to apply assertive behaviour in the workplace if needed.
- Eight *Way We Will Work* principles were introduced. These principles outline how employees are expected to conduct themselves and relate to co-workers (see *Director's Report*).

Staff were also informed about workplace behaviour considered acceptable and not acceptable. New employees are given this information on commencement.

ETHICAL CONDUCT

AIMS has a Code of Conduct to which the Council, Management and staff are required to adhere. The Code complies with Division 4 of the CAC Act and includes relevant sections of the Terms and Conditions of Service for staff. New Council members and staff are briefed on the Code during induction training. Council members also abide by the code of conduct for

directors published by the Australian Institute of Company Directors.

STAFF CONSULTATION

AIMS has a Certified Agreement negotiated between staff and management representatives. Staff consultation occurs through a range of fora. The Joint Consultative Committee met six times in 2001-02. This committee provides a forum for discussion and consultation between management and staff representatives. The Committee reviewed its charter this year with a re-commitment to achieve its purpose. The organisational improvement process has also involved staff in a range of team processes to achieve organisational improvement. Further, regular organisation-wide briefings were held and information made available on the AIMS intranet.

CONSULTANCY ADVICE

The main procedures by which Council members can seek independent professional advice at the Institute's expense, in order to carry out their duties, are largely through the use of consultants and sub-contractors. During 2001-02, the Council consulted with

- Julian Clark Consulting Pty Ltd, which undertook a review of commercialisation at AIMS (See *Key Management Events* and *Business Development*);
- Price Waterhouse Coopers, which completed an organisation-wide risk assessment; and
- Ernst and Young (see *Internal Audit* above).

USE OF SUB-CONTRACTORS

The Institute sometimes engages sub-contractors to provide a service or product that it needs to deliver agreed output. Sub-contractors are selected on quality, value for money, and availability. When the purchase exceeds $30,000, tenders are invited. 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 an immediate family member.

PUBLIC ACCOUNTABILITY

MINISTERIAL DIRECTIONS

- Minister signed three approvals for expenditure over the amount of $100,000.
- Approval for Joint Venture Agreement for management of MNRF Darwin research facility.
- Letter from Minister dated 10 April 2002 re Council remuneration.
- Letter from Minister dated 16 April 2002 re IT outsourcing.
- Minister noted shareholding arrangement in spin-off company ToxiTech.

JUDICIAL DECISIONS AND REVIEWS BY OUTSIDE BODIES

- The Chief Scientist Dr Robin Batterham undertook a review of the Institute's infrastructure and output as part of the wider Review of Marine Research in Tropical Australia. His interim report of April 2000 contained key findings and conclusions concerning infrastructure for marine science in the Townsville region. It recommended that the Institute remain at its Cape Ferguson location, and that the refurbishment program should proceed to completion, as originally approved by Cabinet. The final report of July 2001 also recommended that the Cape Ferguson site be considered for further co-location of marine research capability and small marine R&D-intensive industry. To this end, Dr Batterham recommended that the Commonwealth's lease arrangement for the site be reviewed, to facilitate all such possibilities. The Chief Scientist also found that there were no compelling reasons for folding AIMS into CSIRO Marine Research, or *vice versa*, commenting that there were "advantages to Australian science in a plurality of approaches to research issues, and a plurality of research providers"[11] For example, regionally located organisations are able to respond independently and flexibly to regional needs. Other broader recommendations addressed the development and purpose of national capability in marine science research, infrastructure and technologies.
- No judicial decisions had a significant impact on the operations of AIMS in 2001-02.

OMBUDSMAN

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

[11] See Recommendation 7, Review of Marine Research in Tropical Australia, p. 14.

OH & S INDUCTION ON VESSEL

INVESTING AND FINANCING ACTIVITIES

The Institute invests its funds in commercial bank bills in accordance with Treasury guidelines.

OCCUPATIONAL HEALTH AND SAFETY

The Institute's health and safety management systems were examined by Comcare during a formal investigation conducted under Section 41 (3) of the OH&S Act (Commonwealth Employment) Act 1991. The Institute is addressing the 17 recommendations made by Comcare as a result of the investigation. The Institute reviewed its designated work group structure following the Comcare investigation. The new structure comprises four designated groups, each covered by an elected Health and Safety Representative. Training for these Representatives is currently being organised.

The AIMS OH&S Committee structure was also reviewed during the year. Following this review, the Committee divided into five smaller Committees, each with a specialised function. These Committees will focus on laboratory safety, environment management, people safety, field safety, and dive safety.

Finally, the system for reporting and recording workplace accidents and incidents was reviewed during 2001-02, with records moving from a paper-based system to a computerised database. Twenty-five incidents were reported during the year, with three of these resulting in time lost from the workplace.

There were no formal reactive investigations conducted by Comcare under Section 29 of the OH&S Act. No provisional improvement notices were issued by Health and Safety Representatives, nor were any notices issued by Comcare under Section 45, 46 or 47 of the OH&S Act.

OH&S TRAINING

Twenty-five staff and contractors and a further 131 visitors attended OH&S induction courses, covering general induction, field safety induction and dive induction, throughout the year. A further 162 people attended OH&S related training including first aid, CPR and Oxygen resuscitation, dive rescue, manual handling and radiation safety.

RADIATION SAFETY

The Institute's new radiation laboratory was certified as meeting the requirements of the Australian Radiation Protection and Nuclear Safety Agency.

DR BARRY CLOUGH: SAFETY IN THE FIELD

GENE TECHNOLOGY

During the year the Institute's new PC2 laboratory was formally certified as a facility under the Gene Technology Act 2000. This facility replaced the two deemed facilities previously used for gene technology research. The Institute Biosafety Committee met during the year and assessed all proposed research projects to determine whether the research needed to be registered with OGTR. All research projects were deemed to fall under the Exempt category.

EEO AND WORKPLACE DIVERSITY

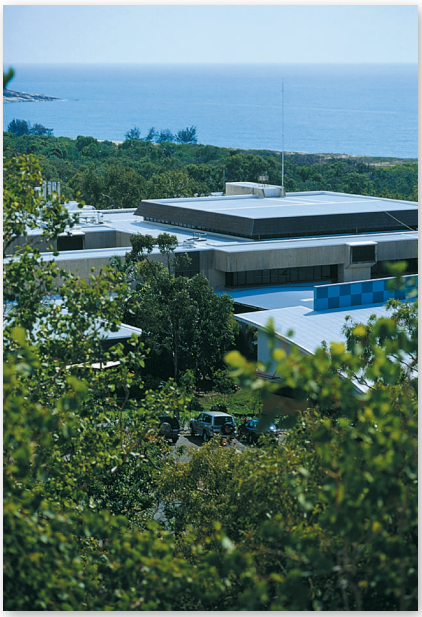
AIMS has a policy of Equal Employment Opportunity. Staff are recruited and promoted on a merit-based system. The statistics in *Organisation and Staffing* show a breakdown by gender and funding source. Diversity is valued, with work practices accommodating the full range of employment options, nationality and ethnic groups, and people with disability. The Institute also has a visitor program that attracted collaborating scientists and students from about 30 countries during the reporting year.

In 2001-02, the organisation reviewed the selection process, number and skill sets of its Workplace Harassment Contact Officers. All members of the organisation participated in Harassment Awareness Training, designed by a staff group and provided by a sub-contractor. In 2001-02 the Institute had no reported cases of harassment, although Harassment Contact Officers gave advice on several occasions.

DISABILITY STRATEGY

The Institute is committed to widening the opportunities for independence, access and full participation by people with disabilities. Progress has been made in implementing the Commonwealth's Disability Strategy, particularly in improving communication and consultation mechanisms, staff recruitment and development, and management protocols.

On a practical level, external and internal access ramps were redesigned in 2001-02 as part of the Institute's Infrastructure Refurbishment Program, to remove physical barriers to access identified by people with disabilities. The internal ramp leading to the lecture theatre, library and general public area of the main building (built in the 1970s) was modified to include hand and floor-level rails, and was also adjusted so the slope could be negotiated more easily by unassisted people in wheelchairs. A new toilet was also installed in



AIMS BUSH SETTING AT CAPE FERGUSON

this public area to give people with disabilities full access and convenience.

In recruitment, the focus at AIMS is on the person's ability to carry out activities fulfilling the inherent requirements of the vacant position. These essential activities form part of the selection and recruitment package. Having said that, all vacancy advertisements placed in the print media and on the World Wide Web state clearly that AIMS is an Equal Opportunity Employer. A range of contact points are advertised for people wanting more information and selection material, and these cater for diverse communication needs, e.g. the Institute provides telephone numbers, email addresses, Webpage references, and the Institute's postal address. People are asked to lodge their applications by email or through the post. In addition, information about the Institute's visitor scheme and specialists' register is provided on the AIMS website, and applications to participate in either of these can be lodged online.

In terms of staff training and development, people with disability are encouraged and supported in their endeavours to gain training and attend courses and workshops that help them advance in the workplace. This aspect of the Institute's performance in relation to the Commonwealth Disability Strategy is under review.

Considerable progress has been made in removing barriers to information about AIMS, its services and the opportunities it provides. The Institute is in the process of implementing an Online Action Plan. Among other things, it seeks to make information on the Web made available in a range of accessible formats. For example, where possible, the Webmaster converts pdf files to html text because the latter can be picked up by Braille readers. The Online Action Plan also provides information or links about the organisation, including the AIMS Client Service Charter.

An area of substantive progress in implementing the Commonwealth Disability Strategy is that of increased consultation with staff about issues that affect them. Through its ongoing program of organisational improvement, the Institute has increased the availability of mechanisms through which all staff, including people with disabilities, can raise concerns. As a consequence of a Culture Benchmarking Survey conducted in August 2001, it was decided to focus on improving the

way staff treated each other and worked together. A set of *Way We Will Work* principles were developed, one of which is "I will involve people in issues that affect them and explain my decisions". Finally, a general feedback form is provided online for members of the public wishing to comment on the Institute's policies, services and facilities, or wanting to lodge complaints or notify the Institute of grievances. Once received, these are investigated by the Human Resources Manager and those involved, and feedback promptly given to the person lodging the complaint.

EMPLOYEE ASSISTANCE PROGRAM

During the year the Institute changed the provider of its employee assistance service. The service is now provided by Employee Assistance Services of North Queensland, who reported steady use of the service by employees throughout the year. Approximately 8.5 percent of staff accessed the counselling service in 2001-2002 compared with 7 percent of staff accessing the services in the previous financial year.

ENVIRONMENT

The Australian Institute of Marine Science is a Commonwealth Government statutory authority involved in marine research. As an organisation whose mission is to generate the knowledge to support the sustainable use and protection of the marine environment, AIMS is strongly committed to protection of this environment.

It is the Institute's policy to achieve and maintain high standards of environmental care in all aspects of its research and operations and to comply with all relevant legislation, including the *Environment Protection and Biodiversity Conservation Act.*

ENVIRONMENT MANAGEMENT PLAN

Work continued on implementing the Institute's Environmental Management Plan during the year. As part of the EMP, the Institute is in the process of implementing an integrated recycling and waste management strategy.

ENVIRONMENTAL MANAGEMENT SYSTEM

The Environmental Management Plan is part of the Institute's overall Environmental Management system (EMS). The EMS, which accords with the principles laid down in the *International Standards on Environmental Management,* the ISO14000 series, is currently being developed.

Through the EMS, the Institute reviews all practices and procedures to reduce or eliminate negative environmental impacts; develops and implements relevant environmental procedures such as waste management and recycling procedures; and conducts regular environmental audits.

NATIONAL ENVIRONMENTAL PROTECTION MEASURES

The Institute uses a number of scheduled substances declared under the National Pollution Inventory of the National Environmental Protection Measures Act, in quantities significantly below the current declared threshold levels. The Institute has met the current reporting requirements of the NPI NEPM.

FREEDOM OF INFORMATION

No requests were received in 2001-02 under provisions of the *Freedom of Information Act 1982.* The statement required under Section 8 of the FOI Act, setting out documents available for inspection, is at Appendix 2.

ADVERTISING AND MARKET RESEARCH

The Institute undertook targeted display advertising in the vicinity of $15,000 in 2001-02. Advertisements related to the promotion of AIMS biotechnology capability and opportunities for co-investment, the Institute's attendance at the North Queensland Field Days, and the public tour program. A small amount of market analysis related to commercialisation of AIMS technologies.

CUSTOMER SERVICE CHARTER

The AIMS Service Charter for dealing with clients is posted to our website, along with a feedback form, and can be viewed at: www.aims.gov.au/pages/about/corporate/csc-01.html

KEY MANAGEMENT EVENTS

ORGANISATIONAL CHANGE

Scoping Processes

Executive, Research Leader and Support Manager Retreats were held in July 2001 to establish the issues and actions required to meet AIMS Future Directions, as foreshadowed in an earlier presentation to all staff by the Director.

A Culture Benchmarking Survey was completed by 98% of staff in August 2001. A group of 16 staff volunteered to develop the issues and questions in the survey. Results from the survey were presented to staff in September 2001. The Executive and the staff group made Action Recommendations to improve the organisation.

An Organisational Improvement Plan was finalised by the Senior Management Group in October 2001.

Progress on the Organisational Improvement Plan is as follows:

MISSION, VISION AND VALUES

Behavioural

Some behavioural issues were highlighted in the Culture Benchmarking Survey. A team of 11 volunteers from across the Institute developed a set of Way We Work Principles in October 2001. The principles are provided in the *Director's Report.*

Organisational

The Director reviewed and finalised the Institute's Mission, Vision and Values Statements with input from all staff. This was completed in November 2001, with approval from Council.

ORGANISATIONAL GOALS

The AIMS Council and the Senior Management Group developed Key Performance Goals for the Institute for the 2002/03 research year. The goals were approved by the AIMS Council, and presented and discussed with all staff in June 2002.

ORGANISATIONAL STRATEGY

- The Research Groups began Strategic Planning for the 2003 – 2006 triennium in February 2002.
- The AIMS Council received a progress report at the June 2002 Council meeting.
- In July 2001, people and resources from Dampier WA were relocated to Fremantle WA and Darwin NT.
- AIMS, in partnership with ANU, received $3.25m from the Major National Research Fund to build infrastructure for the Arafura Timor Research Facility (ATRF) in August 2001. The Agreement with the Commonwealth Government for the ATRF was to be signed in July 2002.

RESEARCH LAUNCHED FROM NEW SCIENCE BASE

ORGANISATIONAL STRUCTURE

The AIMS research base was restructured in November 2001 to three capability-focused Research Groups.

The Senior Management Group was broadened in December 2001 to include the Executive Team, Research Group Leaders, the Human Resources Manager and the Finance Manager.

SYSTEMS

People

The number of Workplace Harassment Contact Officers (WHCOs) was increased from one to seven in October 2001. The WHCOs either volunteered or were nominated by colleagues. The WHCOs attended a workshop in November 2001.

Workplace Harassment Awareness Training was available to all staff in May and June 2002. All staff were encouraged to attend.

A team of 17 staff was formed in March 2002 to improve the system to invite and host visitors and volunteers to AIMS. The team report to the Executive in August 2002.

Two teams were formed to address how Managing People and Performance can be improved at AIMS. Staff volunteered to join the teams. The teams are to 1) develop a Position Classification System and 2) develop a Performance Management System. The teams met in June 2002 to scope issues and define workplans.

An Occupational Health and Safety Audit was completed by ComCare in October 2001. An action plan has been drawn up to address the recommendations.

Business

- Julian Clark Consulting Pty Ltd completed a *Review of Commercialisation at AIMS* in May 2002. The recommendations from the review are being incorporated into Organisational Improvement projects. The recommendations will inform improvements to Business Services, Marketing and Managing and Exploiting Intellectual Property.
- Price Waterhouse Coopers completed an *Organisation-wide Risk Assessment of AIMS* in May 2002. The recommendations from the assessment are being incorporated into Organisational Improvement projects.

INFRASTRUCTURE DEVELOPMENT

'The AIMS buildings at Cape Ferguson provide a comprehensive base for the efficient conduct of a range of marine research activities … the site is ideal for marine research, and there is none better in the region.'

Dr Robin Batterham

The Institute continued its Infrastructure Refurbishment Program (IRP) in 2001-02, with the opening in November of the South Wing by Senator the Hon Nick Minchin, then Minister for Industry, Science and Resources.

The opening of the South Wing marked the end of phase one of the IRP and the start of the new building's commissioning stage. Marine Biotechnology staff began to move in on December 3. It was a moment they had keenly anticipated because, for the first time in the Institute's history, all Biotechnology staff would work together in the same allocated space.

The South Wing offices and laboratories cover 2,500 square metres of floorspace and feature state-of-the-art facilities for research such as DNA analysis, cell culture, microbiology, chemical preparation and fermentation. In addition, there is a centrifuge room and radioisotope laboratory, as well as nuclear magnetic resonance and mass-spectrometer

SENATOR THE HON NICK MINCHIN OPENS NEW WING

CAPE FERGUSON 'AN IDEAL SITE'

facilities, freezers and darkrooms. Aquaculture facilities are nearby.

Laboratory users participated in the design process, contributing their experience and advice as well as reviewing laboratory models used elsewhere. A major decision was to tilt the South Wing eight degrees to the east-west axis of the existing complex. This minimised the bridge link between buildings, freed up space between them, and lessened the impact of the western sun in mid-summer. It also gave architects more leeway to depart from the existing building's design rigours. The building cost about $6 million and was constructed in 11 months.

PHASE 2 UNDERWAY

Phase two of the IRP, costing $6.5 million, started in December 2001 and involves a major upgrade of the original Institute complex, built in the 1970s. By the time it is complete in October 2002, every staff member at AIMS will have been progressively moved to a new location. Most researchers have had to move to temporary space before being able to relocate permanently to a refurbished office or laboratory.

Phase two has concentrated on refurbishment of the central library, office space, laboratories and fixed plant and equipment supporting those laboratories.

As part of the IRP, a new front entrance and public foyer has been created, which showcases AIMS research via a 46-inch DVD plasma screen set against a backdrop of original silkscreen paintings by North Queensland artist Maria Watson. The new foyer reflects the Institute's fresh contemporary upgrade with many innovative design features, including a high-ceiling entry spine. A new boardroom and refurbished conference rooms complete the building makeover.

LOCAL FIRMS USED

In all, the Government provided a funding package of $17.1 million over three years for the Institute's infrastructure refurbishment, with $12.5 million spent on the Cape Ferguson site, $3.8 million on the RV *Cape Ferguson* (launched in December 2000), $500,000 on refurbishment of the existing vessel, RV *Lady Basten,* and $300,000 on general repairs. The whole program has employed about 150 people and has been designed, built and managed by North Queensland firms. In the first phase, 23 trade packages were tendered for earthworks, construction, fit-out and landscaping.

IDEAL SITE

Already, the infrastructure refurbishment has greatly enhanced the Institute's research

capabilities, cementing Cape Ferguson as an ideal location for marine research. The advantages of the AIMS' site and infrastructure were highlighted in the Government's Review of Marine Research in Tropical Australia (released August 2001), in which Dr Batterham commented:

> "The AIMS buildings at Cape Ferguson provide a comprehensive base for the efficient conduct of a range of marine research activities. The 200-hectare site has a jetty for research vessels, easy access to clean seawater, and has ample room for expansion of research capability through co-location of further Federal and State research capacity, and private small-scale R&D-intensive commercial facilities (for example through application of the "incubator" concept). The Review concluded that the Cape Ferguson site is ideal for marine research, and there is none better in the region."

FINANCIAL STATEMENTS

- Statement by Directors
- Independent Audit Report
- Statement of Financial Performance for the year ended 30 June 2002
- Statement of Financial Position as at 30 June 2002
- Statement of Cash Flows for the year ended 30 June 2002
- Schedule of Commitments as at 30 June 2002
- Schedule of Contingencies as at 30 June 2002
- Notes to and Forming Part of the Financial Statements
- Supplementary Financial Information (unaudited) for the year ended 30 June 2002

STATEMENT BY DIRECTORS (COUNCIL MEMBERS)

In our opinion, the attached financial statements give a true and fair view of the matters required by Schedule 1 to the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997* for the year ended 30 June 2002.

Signed 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
9 September 2002

Professor S Hall
Director and Member of Council
9 September 2002

Australian National
Audit Office

INDEPENDENT AUDIT REPORT

To the Minister for Education, Science and Training

Scope

I have audited the financial statements of the Australian Institute of Marine Science for the year ended 30 June 2002. The financial statements comprise:

- Statement by Directors;
- Statements of Financial Performance, Financial Position and Cash Flows;
- Schedules of Commitments and Contingencies; and
- Notes to and forming part of the Financial Statements.

The Directors of the Institute are responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to you.

The audit has been conducted in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Audit procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards and other mandatory professional reporting requirements in Australia and statutory requirements so as to present a view which is consistent with my understanding of the Institute's financial position, its financial performance and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

GPO Box 707 CANBERRA ACT 2601
Centenary House 19 National Circuit
BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

Audit Opinion

In my opinion the financial statements:

(i) have been prepared in accordance with Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997*; and

(ii) give a true and fair view, in accordance with 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 2002, and its financial performance and cash flows for the year then ended.

Australian National Audit Office

Mashelle Parrett
Executive Director

Delegate of the Auditor-General

Canberra
13 September 2002

Statement of Financial Performance

for the year ended 30 June 2002

	Notes	2002 $'000	2001 $'000
Revenues from ordinary activities			
Revenues from Government	5A	24,537	22,571
Sales of goods and services	5B	4,707	4,401
Interest	5C	629	860
Net gains from sale of assets	5D	17	—
Other		161	179
Total revenues from ordinary activities		30,051	28,011
Expenses from ordinary activities			
Employees	6A	11,653	11,540
Suppliers	6B	8,858	9,211
Grants	6D	157	162
Depreciation	6C	3,063	2,038
Net losses from sale of assets	5D	—	284
Write off of assets	5E	693	58
Total expenses from ordinary activities		24,424	23,293
Net operating surplus from ordinary activities		5,627	4,718
Net surplus attributable to the Commonwealth		5,627	4,718
Net credit to asset revaluation reserve	10B	487	—
Total revenues, expenses and valuation adjustments attributable to the Commonwealth and recognised directly in equity.		487	—
Total changes in equity other than those resulting from transactions with owners as owners		6,114	4,718

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

STATEMENT OF FINANCIAL POSITION

as at 30 June 2002

	Notes	2002 $'000	2001 $'000
ASSETS			
Financial assets			
Cash	7A	67	505
Investments	7B	8,161	8,519
Receivables	7C	1,516	1,552
Total financial assets		9,744	10,576
Non-financial assets			
Land and buildings	8A	30,638	25,174
Plant and equipment	8B	11,998	12,062
Inventories	8C	225	253
Other	8D	310	215
Total non-financial assets		43,171	37,704
Total assets		52,915	48,280
LIABILITIES			
Provisions			
Capital use charge		71	17
Employees	9A	5,174	4,872
Total provisions		5,245	4,889
Payables			
Suppliers		1,284	1,202
Consultancies and grants	9B	948	640
Total payables		2,232	1,842
Total liabilities		7,477	6,731
EQUITY			
Contributed equity	10	28,187	25,376
Reserves	10A,10B	14,871	14,384
Accumulated surplus	10	2,380	1,789
Total equity interest		45,438	41,549
Total liabilities and equity		52,915	48,280
Current liabilities		3,788	3,215
Non-current liabilities		3,689	3,516
Current assets		6,079	11,044
Non-current assets		46,836	37,236

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

Statement of Cash Flows

for the year ended 30 June 2002

	Notes	2002 $'000	2001 $'000
OPERATING ACTIVITIES			
Cash received			
Appropriations		24,537	22,571
Sales of goods and services		5,041	4,257
Interest		1,049	557
GST recovered from taxation authority		1,263	969
Other		160	179
Total cash received		32,050	28,533
Cash used			
Grants		158	163
Employees		11,351	11,233
Suppliers		10,515	10,374
Total cash used		22,024	21,770
Net cash from operating activities	11	10,026	6,763
INVESTING ACTIVITIES			
Cash received			
Proceeds from sale of property, plant and equipment		181	336
Total cash received		181	336
Cash used			
Purchase of property, plant and equipment		8,832	6,437
Total cash used		8,832	6,437
Net cash used by investing activities		8,651	6,101
FINANCING ACTIVITIES			
Cash received			
Equity Appropriation		2,811	3,486
Total cash received		2,811	3,486
Cash used			
Capital use charge paid		4,982	8,484
Total cash used		4,982	8,484
Net cash used by financing activities		2,171	4,998
Net decrease in cash held		796	4,336
Cash at beginning of the reporting period		9,024	13,360
Cash at the end of the reporting period	7B	8,228	9,024

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

SCHEDULE OF COMMITMENTS

as at 30 June 2002

	2002 $'000	2001 $'000
BY TYPE		
Capital commitments		
Buildings [1]	2,303	9,293
Plant and equipment [2]	631	158
Total capital commitments	2,934	9,451
Other commitments		
Operating leases[3]	443	538
CRC Reef	9,832	12,750
Contracts	1,801	4,365
Other [4]	2,177	2,038
Total other commitments	14,253	19,691
Commitments receivable	(1,605)	(2,650)
Net commitments	15,582	26,492
BY MATURITY		
All net commitments		
One year or less	7,624	13,179
From one to five years	7,958	13,063
Over five years	—	250
Net commitments	15,582	26,492
Operating lease commitments		
One year or less	267	320
From one to five years	176	218
Over five years	—	—
Net operating lease commitments	443	538

Commitments are GST inclusive where relevant.

[1] Outstanding contractual payments for building under refurbishment.

[2] Plant and equipment commitments include contracts for plant and equipment for existing and new buildings.

[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] As at 30 June 2002, other commitments comprise amounts payable under grants agreements in respect of which the recipient is yet to perform the services required.

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

Schedule of Contingencies

as at 30 June 2002

UNQUANTIFIABLE CONTINGENCIES

At 30 June 2002, 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 statement should be read in conjunction with the accompanying notes.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

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 2001-2002) Orders);
- Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Boards;
- Other authoritative pronouncements of the Board; and
- Consensus Views of the Urgent Issues Group.

The Statements have been prepared having regard to:

- The Explanatory Notes to Schedule 1 issued by the Department of Finance and Administration; and
- Finance Briefs issued by the Department of Finance and Administration.

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 on 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 agreement equally proportionately unperformed are however not recognised unless required by an Accounting Standard. Liabilities and assets which are unrecognised are reported in the Schedule of Commitments and Schedule of Contingencies.

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

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

1.2 Changes in Accounting Policies

The Institute has capitalised workshop jobs which met the asset criteria (refer note 1.14) in the financial year 2001-02. In previous years these costs would have been expensed.

1.3 Reporting by Outcomes

A comparison of Budget and Actual figures by outcomes specified in the Appropriation Acts relevant to the Institute is presented in Note 19. Any intra-government costs included in the figure 'net cost to Budget outcomes' are eliminated in calculating the actual budget outcome for the Government overall.

1.4 Revenue

- The revenues described in this Note are revenue 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 proportional basis taking into account the interest rates applicable to the financial assets.
- Dividend revenue is recognised when the right to receive a dividend has been established.
- Revenues 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 or agreements to provide services to Commonwealth bodies. The stage of completion is determined according to the proportion that costs incurred to date bear to the estimated total costs of the transactions.

Revenues from Government – Output Appropriations

Appropriations for outputs are recognised as revenue to the extent they have been received into the Institute's bank account or are entitled to be received by the Institute at the year end.

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 are 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.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

1.5 Transactions by the Government as Owner

Appropriations to the Institute designated as 'capital-equity injections' are recognised directly in equity, to the extent that the appropriations have been received into the Institute's bank account or are entitled to be received by the Institute at year end.

1.6 Employee Entitlements

(a) Leave

The liability for employee entitlements 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 by the Institute's employees in the future years is estimated to be less than the annual entitlement for sick leave.

The provision for annual leave reflects the value of total annual leave entitlements of all employees at 30 June 2002 and is recognised at its nominal value.

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 2002. In determining the present value of the liability, the Institute has taken into account attrition rates and pay increases through promotion and inflation.

(b) Superannuation

Employees contribute to the Commonwealth Superannuation Scheme and the Public Sector Superannuation Scheme. Employer contributions amounting to $1,142,062 (2000-01: $1,171,295) for the Institute in relation to these schemes have been expensed in these financial statements.

No liability for superannuation benefits is recognised as at 30 June 2002 as the employer contributions fully extinguish the accruing liability which is assumed by the Commonwealth.

Employer Superannuation Productivity Benefit contributions totalled $283,777 (2000-01: $281,216) for the Institute.

1.7 Leases

A distinction is made between finance leases which effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to ownership of leased assets and operating leases under which the lessor effectively retains substantially all such risk and benefits.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

Operating lease payments are expensed on the basis which is representative of the pattern of benefits derived from the leased assets.

1.8 Cash

Cash means cash and coins held and any deposits held at call with a bank or financial institution.

1.9 Financial Instruments

Accounting policies for financial instruments are stated in Note 17.

1.10 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.

1.11 Taxation

The Institute is exempt from all forms of taxation except fringe benefits tax and goods and services tax.

1.12 Inventories

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

Inventories not held for sale 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 are assigned on first in first out basis.

1.13 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.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and revenues at their fair value at the date of acquisition.

1.14 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

Land, buildings, infrastructure, plant and equipment are revalued progressively in accordance with the 'deprival' method of valuation in successive 3-year cycles, so that no asset has a value greater than three years old.

A revaluation of buildings and infrastructure was obtained at 30 June 2001. However, no adjustment was made to carrying values as there were not significant differences from the revalued amounts. The valuation was supplied by Mr M Missingham (AAPI), Certified Practising Valuer No: 1273, Herron Todd White.

Plant and equipment, specifically weather stations, were included as assets for the first time in the 2001-02 financial year at Directors' valuation.

Other plant and equipment was revalued at 30 June 1999 and library books and journals were revalued on 1 July 1998.

Property, plant and equipment are measured at their depreciated replacement cost. Where assets are held which would not be replaced or are surplus to requirements, measurement is at net realisable value. At 30 June 2002 the Institute had no assets in this situation.

Recoverable amount test

Schedule 1 requires the application of the recoverable amount test to the Institute's non-current assets in accordance with AAS 10 *Recoverable Amount of Non-Current Assets.* The carrying amount of each item of non-current property, plant and equipment assets have been reviewed to determine whether it is in excess of the asset's recoverable amount. If an excess exists as at the reporting date, the asset is written down to its recoverable amount immediately. In assessing recoverable amounts, the relevant cash flows, have been discounted to their present value.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

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 assets are based on the following useful lives:

	2001 – 02	2000 – 01
Buildings and improvements	**10 to 40 years**	10 to 60 years
Plant and equipment	**3 to 20 years**	3 to 20 years

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

1.15 Insurances

The Institute has insured for risks through the Government's insurable risk managed fund, called 'Comcover'. Workers Compensation is insured through Comcare Australia.

1.16 Investments

The Australian Institute of Marine Science (AIMS) is a member Institute of AMRAD Corporation Ltd (AMRAD). Under an "Institute Agreement" between AMRAD, the Victorian Medical Consortium Pty Ltd (VMC) and AIMS, AMRAD has allotted to VMC 333,334 fully paid one dollar shares to be held on trust for AIMS. The agreement allows AIMS to require VMC to transfer to it all or part of the shares and any bonus shares, or to sell such shares and pay the proceeds to AIMS. This can only occur if AIMS is still a party to the Institute Agreement upon the first ninth anniversary of the date of execution of the Agreement (29 October 1993). The shares have not been brought to account in the Institute's financial statements as it is considered that the Institute is unable to exercise any ownership or control over these assets at the present time.

Cash held on term deposit with a bank is included in investments.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

1.17 Capital Use Charge

A capital use charge of 11% (2000-01 12%), is imposed by the Commonwealth on the net assets of the Institute. The charge is adjusted to take into account asset gifts and revaluation increments during the financial year.

1.18 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.

1.19 Comparative Figures

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

1.20 Research, Development and Intellectual Property

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

1.21 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 agreements 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.

1.22 Consultancies and Grants

Various consultancies and grants have been made to the Institute for specific research projects, seminars, 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.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

NOTE 2. REPORTING BY SEGMENTS AND OUTCOMES

A comparison of Budget and Actual figures by outcome specified in the Appropriation Acts relevant to the Authority is presented in Note 19. Any intra-government costs included in the figure 'net cost to Budget outcomes' are eliminated in calculating the actual budget outcome for the Government overall.

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. SUBSEQUENT EVENTS

The Institute is not aware of any material events that have occurred subsequent to balance date.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

NOTE 5. OPERATING REVENUE

		2002 $'000	2001 $'000
5A	**Revenues from Government**		
	Appropriation operating	16,797	16,788
	Appropriation asset replacement	2,775	1,148
	Appropriation capital use charge	4,965	4,635
		24,537	22,571
5B	**Sale of Goods and Services**		
	Australian industry	1,009	612
	Australian governments	430	427
	Joint government/industry	2,350	1,925
	International industry	328	155
	International governments	476	742
	International joint government/industry	—	2
	Publications	114	538
		4,707	4,401
5C	**Interest**		
	Term deposits	629	860
5D	**Net Gain from Sales of Assets**		
	Plant and equipment:		
	Proceeds from sale	181	336
	Net book value at sale	164	620
	Net gain	17	(284)
	Less: plant and equipment written off on disposal (note 5E)	(179)	(58)
	Net loss on disposal of plant and equipment	(162)	(342)
5E	**Write-Down of Assets**		
	Building – write-down for renovations	514	—
	Plant and equipment – write-off on disposal	179	58
		693	58

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 6. OPERATING EXPENSES

		2002 $'000	2001 $'000
6A	**Employee Expenses**		
	Basic remuneration for services provided	8,717	8,628
	Related employees expenses:		
	Superannuation	1,426	1,452
	Provision for annual recreation leave	902	796
	Provision for long service leave	366	313
	Fringe benefit tax	199	226
	Remote location subsidy	—	68
	Workers compensation insurance	43	57
	Total Employee expenses	11,653	11,540

The Institute contributes to the Commonwealth Superannuation (CSS) and the 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 18% of salary (CSS) and 10.4% 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 2002

NOTE 6. OPERATING EXPENSES (CONTINUED)

		2002 $'000	2001 $'000
6B	**Suppliers Expenses**		
	Operating lease rentals	303	288
	Supply of goods and services		
	Appointment expenses	65	68
	Equipment and software purchases	165	161
	Catering subsidy	71	80
	Chemical supplies	66	70
	Cleaning and ground maintenance	193	182
	Communications, telephone, postage	341	307
	Consultancies	1,299	927
	Consumables	618	671
	Electricity	282	356
	Field costs	47	35
	Freight	119	207
	Fuel, oil, distillates	366	414
	Hire of equipment	193	233
	Insurances	168	138
	Laboratory expenses	155	175
	Legal expenses	88	35
	Licenses and fees	147	130
	Patents and trademarks	79	55
	Publications, journals, subscriptions	373	837
	Rent	25	82
	Repairs and maintenance	856	815
	Security	144	139
	Stationery	79	88
	Training, seminars and conferences	106	204
	Travel and accommodations	857	954
	Vessels management and staffing	1,508	1,452
	Victuals	57	54
	Water	88	54
	Total suppliers expenses	8,858	9,211

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 6. OPERATING EXPENSES (CONTINUED)

		2002 $'000	2001 $'000
6C	**Depreciation**		
	Depreciation property, plant, equipment	3,063	2,038
	Building and improvements	1,038	544
	Computer equipment	587	372
	Library	204	204
	Office equipment	31	24
	Plant and equipment	661	533
	Ships, launches and vessels	434	269
	Vehicles	108	92
		3,063	2,038
6D	**Grants**		
	Non-profit institutions	157	162

The Institute provides grants to various organisations for the purpose of marine science research.

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

NOTE 7. FINANCIAL ASSETS

		2002 $'000	2001 $'000
7A	**Cash**		
	Cash on hand	5	5
	Cash at bank	12	366
	Deposits at call	50	134
		67	505
7B	**Investments**		
	Term Deposits	8,161	8,519
		8,161	8,519
	Balance of cash as at 30 June shown in the Statement of Cash Flows	8,228	9,024
	Investments are categorised as follows:		
	Current	4,028	9,024
	Non-current	4,200	—
		8,228	9,024
7C	**Receivables**		
	Goods and services	702	342
	Less : Provision for doubtful debts	(5)	(3)
		697	339
	GST receivable	79	116
	Other receivables	740	1,097
	Total receivables	1,516	1,552
	Receivables (gross) which are aged as follows:		
	Not Overdue	1,296	1,468
	Overdue by :		
	-less than 30 days	74	76
	- 30 to 60 days	41	3
	- 60 to 90 days	110	8
		225	87
	Total receivables (gross)	1,521	1,555

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 8. NON-FINANCIAL ASSETS

		2002 $'000	2001 $'000
8A	**Buildings and improvements**		
	Buildings and improvements at directors' valuation 30 June 2001	21,512	22,034
	Accumulated depreciation	(2,256)	(1,421)
		19,256	20,613
	Buildings and improvements at cost	7,077	784
	Accumulated depreciation	(221)	(21)
		6,856	763
	Building work in progress	4,526	3,798
	Total buildings and improvements	30,638	25,174
8B	**Plant and equipment and other**		
	Plant and equipment at directors' valuation 30 June 2002	400	—
	Accumulated depreciation	(26)	—
		374	—
	Plant and equipment at independent valuation 30 June 1999	2,634	2,782
	Accumulated depreciation	(1,212)	(747)
		1,422	2,035
	Plant and equipment at cost	1,891	1,035
	Accumulated depreciation	(342)	(230)
		1,549	805
	Total plant and equipment	3,345	2,840
	Computer equipment at independent valuation 30 June 1999	677	773
	Accumulated depreciation	(426)	(307)
		251	466

NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)

	2002 $'000	2001 $'000
Plant and equipment and other (continued)		
Computer equipment at cost	1,680	1,097
Accumulated depreciation	(655)	(245)
	1,025	852
Total computer equipment	1,276	1,318
Vehicles at independent valuation 30 June 1999	86	86
Accumulated depreciation	(44)	(29)
	42	57
Vehicles at cost	493	397
Accumulated depreciation	(98)	(67)
	395	330
Total vehicles	437	387
Office equipment at independent valuation 30 June 1999	135	135
Accumulated depreciation	(68)	(45)
	67	90
Office equipment at cost	93	19
Accumulated depreciation	(10)	(3)
	83	16
Total office equipment	150	106
Ships, launches and vessels at independent valuation 30 June 1999	1,144	1,168
Accumulated depreciation	(478)	(239)
	666	929
Ships, launches and vessels at cost	3,928	3,858
Accumulated depreciation	(281)	(101)
	3,647	3,757
Total ships, launches and vessels	4,313	4,686

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)

		2002 $'000	2001 $'000
	Plant and equipment and other (continued)		
	Library books at independent valuation 1 July 1998	3,245	3,328
	Accumulated depreciation	(814)	(612)
	Total library books	2,431	2,716
	Capital work in progress	46	9
Total plant, equipment and other		11,998	12,062
8C	**Inventories**		
	All inventories are current assets.		
	Inventories held for sale	51	52
	Stores inventories not held for sale (cost)	174	201
		225	253
8D	**Other Non-Financial Assets**		
	Work in progress	88	76
	Prepayments	222	139
		310	215

NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)

8E. Analysis of Property, Plant and Equipment

TABLE A. Movement summary 2001-02 for all assets irrespective of valuation basis.

Item	Buildings & Improvements	Total Plant & Equipment	Total
	$'000	$'000	$'000
Gross value as at 1 July 2001	26,616	14,686	41,302
Additions : Purchase of Assets	6,293	1,775	8,068
Revaluations : write ups/ (write-downs)	—	487	487
Disposals	(522)	(533)	(1,055)
Capital Work in progress capitalised during the financial year	(3,798)	(9)	(3,807)
Capital Work in progress accumulated during the financial year	4,526	46	4,572
Gross value as at 30 June 2002	33,115	16,452	49,567
Accumulated Depreciation as at 1 July 2001	1,442	2,624	4,066
Disposals	(3)	(195)	(198)
Depreciation charge for the year	1,038	2,025	3,063
Accumulated Depreciation as at 30 June 2002	2,477	4,454	6,931
Net book value as at 30 June 2002	30,638	11,998	42,636
Net book value as at 1 July 2001	25,174	12,062	37,236

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 8. NON-FINANCIAL ASSETS (CONTINUED)

8E. Analysis of Property, Plant and Equipment (continued)

TABLE B. Summary of balances of assets at valuation as at 30 June 2002

Item	Buildings & Improvements $'000	Total Plant & Equipment $'000	Total $'000
As at 30 June 2002			
Gross value	21,512	8,321	29,833
Accumulated Depreciation	(2,256)	(3,068)	(5,324)
Net Book Value	19,256	5,253	24,509
As at 30 June 2001			
Gross value	22,034	8,272	30,306
Accumulated Depreciation	(1,421)	(1,979)	(3,400)
Net Book Value	20,613	6,293	26,906

TABLE C. Summary of assets under construction as at 30 June 2002

Item	Buildings & Improvements $'000	Total Plant & Equipment $'000	Total $'000
As at 30 June 2002			
Gross value	4,526	46	4,572
Accumulated Depreciation	—	—	—
Net Book Value	4,526	46	4,572
As at 30 June 2001			
Gross value	3,798	9	3,807
Accumulated Depreciation	—	—	—
Net Book Value	3,798	9	3,807

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

NOTE 9. PROVISIONS AND PAYABLES

		2002 $'000	2001 $'000
9A	**Employee Provisions**		
	Salaries and wages	347	247
	Annual leave	1,969	1,952
	Long service leave	2,790	2,564
	Fringe benefit tax	52	56
	Sundry	16	53
		5,174	4,872
	Employee provisions are categorised as follows:		
	Current	1,485	1,356
	Non-current	3,689	3,516
		5,174	4,872
9B	**Consultancies and Grants**		
	Non-profit institutions	262	450
	Profit institutions	33	37
	Overseas entities	653	153
		948	640

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 10A EQUITY

Item		Capital	Accumulated Results		Asset Revaluation Reserve		Total Reserves		Total Equity	
	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000
Balance 1 July	25,376	21,890	1,789	1,577	14,384	14,384	14,384	14,384	41,549	37,851
Operating result	—	—	5,627	4,718	—	—	—	—	5,627	4,718
Net revaluation increases (refer Note 10B)	—	—	—	—	487	—	487	—	487	—
Contribution of equity: appropriation	2,811	3,486	—	—	—	—	—	—	2,811	3,486
Capital Use Charge paid	—	—	(5,036)	(4,654)	—	—	—	—	(5,036)	(4,654)
Capital Use Charge refund	—	—	—	148	—	—	—	—	—	148
Closing balance as at 30 June	28,187	25,376	2,380	1,789	14,871	14,384	14,871	14,384	45,438	41,549
Total equity attributable to the Commonwealth	28,187	25,376	2,380	1,789	14,871	14,384	14,871	14,384	45,438	41,549

Notes to and Forming Part of the Financial Statements

for the year ended 30 June 2002

		2002 $'000	2001 $'000
10B	**Asset Revaluation Reserve**		
	Asset revaluation reserve 1 July	14,384	14,384
	Revaluation for the year	487	—
	Balance 30 June	14,871	14,384
	The net revaluation increase comprised of:		
	Increment - plant and equipment weather stations at directors' valuation June 30 2002	400	—
	Increment plant and equipment valuation correction to independent valuation June 1999	87	—
		487	—

NOTE 11. CASH FLOW RECONCILIATION

	2002 $'000	2001 $'000
Reconciliation of operating surplus to net cash provided by operating activities		
Operating Surplus	5,627	4,718
Depreciation	3,063	2,038
Write down of assets	693	342
Gain on disposal of non-current assets	(17)	—
Changes in assets and liabilities		
(Increase)/Decrease in receivables	(375)	139
(Increase)/Decrease in accrued revenue	409	(641)
(Increase)/Decrease in inventory	28	13
(Increase)/Decrease in other assets	(95)	(12)
Increase/(Decrease) in employees provisions	202	307
Increase/(Decrease) in suppliers payable	80	26
Increase/(Decrease) in other creditors	411	(167)
Net cash provided from operating activities	10,026	6,763

NOTE 12. EXTERNAL FINANCING ARRANGEMENTS

	2002 $'000	2001 $'000
The Institute has finance facilities with the Commonwealth Bank of Australia as follows:		
Total facilities	1,429	1,514
Amount of facility used as at 30 June	(79)	(164)
Facility available	1,350	1,350

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 2002

NOTE 13. REMUNERATION OF DIRECTORS (MEMBERS OF COUNCIL)

	2002 $	2001 $
Aggregate amount of superannuation payments in connection with the retirement of directors	—	25,530
Other remuneration received or due and receivable by directors of the Institute	291,288	249,557
Total remuneration received or due and receivable by directors of the Institute	291,288	275,087
The number of directors of the Institute included in these figures are shown below in the relevant remuneration bands	Number	
■ $10,001 – $20,000	4	4
■ $20,001 – $30,000	1	1
■ $60,001 – $70,000	—	1
■ $120,001 – $130,000	—	1
■ $200,001 – $210,000	1	—
	6	7

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)
- Mr B McKay
- Dr W Craik
- Mr B Guthrie
- Dr M Sleigh
- Professor S Hall (Chief Executive Officer)

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 2002

NOTE 15. REMUNERATION OF OFFICERS

	2002 $	2001 $
The aggregate amount of total remuneration of Officers	427,573	427,837

The number of Officers who received or were due to receive total remuneration of $100,000 or more:
shown below in the relevant remuneration bands

	Number	
■ $130,001 - $140,000	—	2
■ $140,001 - $150,000	**3**	—
■ $150,001 - $160,000	—	**1**
	3	**3**

The Officer remuneration includes all officers concerned with or taking part in the management of the economic entity during 2001-02 except the Chief Executive Officer. Details in relation to the Chief Executive Officer have been incorporated into Note 13 – *Remuneration of Directors.*

NOTE 16. REMUNERATION OF AUDITORS

	2002 $	2001 $
Remuneration to the Auditor-General for auditing the financial statements for the reporting period.	42,000	41,150

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 2002

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)
Financial Assets	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.	
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 (2000-01 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 twenty months from June 30 2002. The term deposits earned an average annual interest rate of 6.05%.
Financial Liabilities		Financial liabilities are recognised when a present obligation to another party is entered into and the amount of the liability can be reliably measured.	
Creditors		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.

NOTE 17. FINANCIAL INSTRUMENTS (CONTINUED)

Table B. Interest Rate Risk

Financial Instrument	Notes	Floating Interest Rate		Fixed Interest Rate 1 year or less		Fixed Interest Rate 1 to 5 years		Non-Interest Bearing		Total		Weighted Average Effective Interest Rate	
		2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 $'000	2001 $'000	2002 %	2001 %
Financial Assets (Recognised)													
Cash at Bank	7A	12	366	—	—	—	—	—	—	12	366	2.70	4.53
Cash on Hand	7A	—	—	—	—	—	—	5	5	5	5	n/a	n/a
Deposits at Call	7A	50	134	—	—	—	—	—	—	50	134	3.07	5.25
Receivables and Accrued Income	7C	—	—	—	—	—	—	1,516	1,552	1,516	1,552	n/a	n/a
Term Deposit	7B	—	—	3,961	8,519	4,200	—	—	—	8,161	8,519	6.05	6.77
Total Financial Assets (Recognised)		62	500	3,961	8,519	4,200	—	1,521	1,557	9,744	10,576	—	—
Total Assets		—	—	—	—	—	—	—	—	52,915	48,280	—	—
Financial Liabilities (Recognised)													
Creditors		—	—	—	—	—	—	1,284	1,202	1,284	1,202	n/a	n/a
Consultancies and grants	9B	—	—	—	—	—	—	948	640	948	640	—	—
Capital use charge		—	—	—	—	—	—	71	17	71	17	—	—
Total Financial Liabilities (Recognised)		—	—	—	—	—	—	2,303	1,859	2,303	1,859	—	—
Total Liabilities										7,477	6,731		

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 17. FINANCIAL INSTRUMENTS (CONTINUED)

Table C. Net Fair Values of Financial Assets and Liabilities

	Notes	2002 Total Carrying Amount $'000	2002 Aggregate Net Fair Value $'000	2001 Total Carrying Amount $'000	2001 Aggregate Net Fair Value $'000
Financial Assets					
Cash at bank	7A	12	12	366	366
Cash on hand	7A	5	5	5	5
Deposits at call	7A	50	50	134	134
Receivables	7C	1,521	1,521	1,555	1,555
Term deposits	7B	8,161	8,161	8,519	8,519
Total Financial Assets		9,749	9,749	10,579	10,579
Financial Liabilities					
Creditors		1,284	1,284	1,202	1,202
Consultancies and grants		948	948	640	640
Capital use charge		71	71	17	17
Total Financial Liabilities		2,303	2,303	1,859	1,859

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.

Statement of Financial Performance

for the year ended 30 June 2002

NOTE 18 EMPLOYEE EQUIVALENTS

	Number	
	2002	2001
The number of full-time equivalents employed for the year	150	156

NOTE 19 REPORTING OF OUTCOMES

The Institute is structured to meet one outcome-

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

	2002		2001	
	Actual $'000	Budget $'000	Actual $'000	Budget $'000
(a) Reporting by outcome				
Net cost of departmental outputs	30,164	29,540	27,289	27,206
Net cost to budget outcomes	30,164	29,540	27,289	27,206

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

for the year ended 30 June 2002

NOTE 19 REPORTING OF OUTCOMES (CONTINUED)

	2002 $'000	2001 $'000
(b) Major Departmental Revenue and Expenses by Output Group		
Operating Revenues		
Revenues from Government	24,537	22,571
Sale of goods and services	4,707	4,401
Other revenues	807	1,039
Total operating revenues	30,051	28,011
Operating Expenses		
Employees	11,653	11,540
Suppliers	8,858	9.211
Grants	157	162
Depreciation	3,063	2,038
Net loss on disposal of assets	693	342
Total operating expenses	24,424	23,293
(c) Major classes of Departmental Assets and Liabilities by Output Group		
Output specific departmental assets		
Goods and services receivable	702	342
Less provision for doubtful debts	(5)	(3)
Net GST receivable	79	116
Cash at bank and on hand	67	505
Other receivables	740	1,097
Investments	8,161	8,519
Building and improvements	30,638	25,174
Plant and equipment	11,998	12,062
Inventories	225	253
Other	310	215
Total specific departmental assets	52,915	48,280
Output specific departmental liabilities		
Consultancies and grants	948	640
Suppliers	1,284	1,202
Capital use charge	71	17
Employees	5,174	4,872
	7,477	6,731

The Institute has one outcome and only one output. All financial statements relate to one outcome and output.

Supplementary Financial Information (unaudited)

for the year ended 30 June 2002

REVENUE COMPARISON

	2002 $'000	2001 $'000	2000 $'000	1999 $'000	1998 $'000
Consultancies and grants	4,707	4,401	4,623	4,889	5,284
Interest	629	860	626	498	294
Other revenue	161	179	91	70	109
Sub – total	5,497	5,440	5,340	5,457	5,687
Appropriation operating	16,797	16,788	16,703	16,506	16,388
Appropriation asset replacement	2,775	1,148	1,439	—	—
Appropriation capital & infrastructure	2,811	3,486	2,994	1,996	—
Appropriation capital use charge	4,965	4,635	3,817	—	—
Total appropriation	27,348	26,057	24,953	18,502	16,388
Abnormal income	—	—	—	3,328	—
Total Revenue	32,845	31,497	30,293	23,959	22,075
External earnings ratio	19%	21%	20%	23%	24%

EXTERNAL EARNINGS TARGET

In 1990 the Commonwealth Government set external earnings targets for the three science agencies (AIMS, CSIRO and ANSTO). The specific aim of the targets was to encourage closer relations between the researchers, industry and other potential users. It was foreseen that this would, among other things, lead to benefits arising from research being more available to Australian Industry. AIMS' external earnings target is 20 percent of total revenue adjusted for unrelated revenue.

The actual external earnings ratio has been calculated by excluding interest and other revenue from the external sub-total and excluding capital & infrastructure and capital use charge from the appropriation total.

SUPPLEMENTARY FINANCIAL INFORMATION (UNAUDITED)

for the year ended 30 June 2002

SOURCE OF EXTERNAL EARNINGS BY INDUSTRY

	2002 $'000	2001 $'000	2000 $'000	1999 $'000	1998 $'000
Australian government	430	427	458	759	874
Aus joint government / industry	2,350	1,925	2,200	2,069	2,271
International governments	476	742	477	378	218
Australian industry	1,009	612	895	992	1,505
International industry	328	155	581	679	416
International joint government / industry	—	2	12	12	—
Publications	114	538	—	—	—
	4,707	4,401	4,623	4,889	5,284

COOPERATIVE RESEARCH CENTRE (CRC)

In 1994 the Institute entered into agreement with two Cooperative Research Centres, Ecologically Sustainable Development in the Great Barrier Reef (known as CRC Reef Centre) and CRC Aquaculture.

Comparison of contribution resulting from CRCs are :-

	2002 $'000	2001 $'000	2000 $'000	1999 $'000	1998 $'000
AIMS contribution in kind to the two CRCs were:					
CRC Reef Centre	2,765	2,885	2,147	1,605	1,499
CRC Aquaculture	—	141	499	511	543
Research income received from CRCs were:					
CRC Reef Centre	1,790	1,189	1,090	981	1,260
CRC Aquaculture	30	74	336	313	295

EMPLOYEE STAFF YEARS

Comparison of staff years for the last five years:	Number				
	2002	2001	2000	1999	1998
Science appropriation	79.80	81.50	81.20	74.00	68.81
Science external	13.00	11.10	16.90	29.70	39.16
Science total	92.80	92.60	98.10	103.70	107.97
Support	57.60	63.10	61.60	58.70	58.14
Total Institute	150.40	155.70	159.70	162.40	166.11

Supplementary Financial Information (unaudited)

for the year ended 30 June 2002

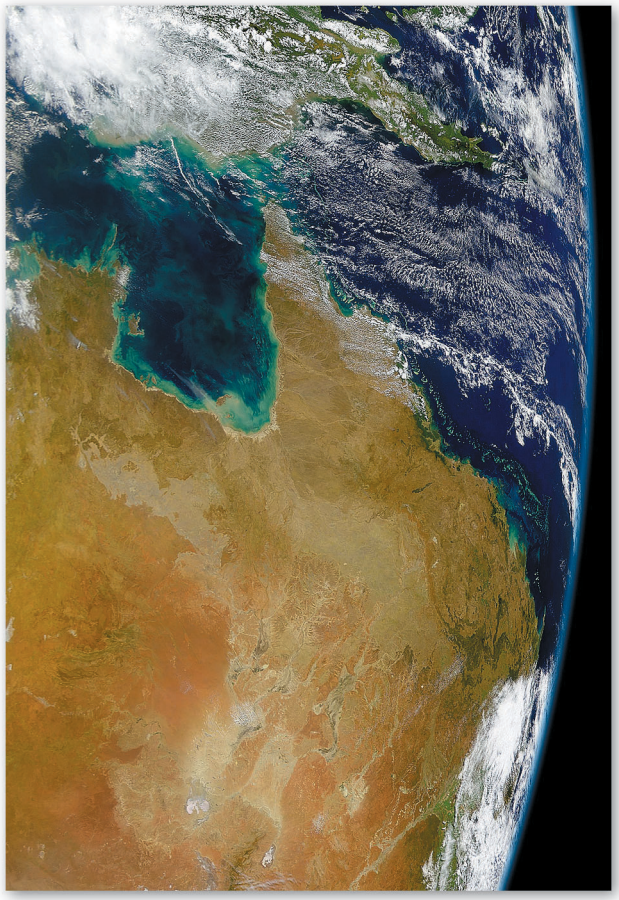
COST OF OUTPUT BY RESEARCH GROUPS

	Variable $'000	Salaries $'000	Fixed $'000	Overheads $'000	Total $'000
The Coastal Processes Group					
Appropriation	694	2,565	1,595	3,079	7,933
External	238	421	71	505	1,235
Total	932	2,986	1,666	3,584	9,168
The Conservation and Biodiversity Group					
Appropriation	388	2,086	1,286	2,503	6,263
External	1,364	553	233	664	2,814
Total	1,752	2,639	1,519	3,167	9,077
The Marine Biotechnology Group					
Appropriation	386	1,771	732	2,124	5,013
External	396	304	101	365	1,166
Total	782	2,075	833	2,489	6,179
Total Summary					
Appropriation	1,468	6,422	3,613	7,706	19,209
External	1,998	1,278	405	1,534	5,215
Total	3,466	7,700	4,018	9,240	24,424

Science projects were restructured in the current year, with five projects consolidated to three, comparison of individual projects to previous year is not possible.

NB: The Corporate and Support Section expenditure has been apportioned to Research Projects in proportion to salary incurred by each project and it is shown as overheads.

APPENDICES



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* (AIMS Act).

The Institute is responsible to the Minister for Industry, Science and Resources.

FUNCTIONS

The functions of AIMS, as defined in Section 9 of the AIMS Act, are to:

(a) Carry out research and development in relation to marine science and marine science technology;
(b) Encourage and facilitate the application and use of the results of research and development of that kind;
(c) Arrange for carrying out research and development of that kind;
(d) Co-operate with other institutions and persons in carrying out research and development of that kind;
(e) Provide any other institution or person with facilities for carrying out research and development of that kind;
(f) Collect and disseminate information relating to marine science and marine technology and, in particular, to publish reports and other papers;
(g) Provide and sell goods (whether produced by the Institute or purchased or otherwise acquired by the Institute) and services in connection with matters related to its research and development activities in marine science and marine technology;
(h) Make available to others, on a commercial basis, the knowledge, expertise, equipment and facilities of the Institute;
(i) 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 technology.

MINISTERIAL POWERS OF DIRECTION

Under Section 10 (1) of the *Australian Institute of Marine Science Act,* 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 appointment of staff who are not Australian citizens (Section 33(2));
9. Approving the Institute to enter into a contract involving the payment of Institute funds of an amount exceeding $100,000 (Section 42);
10. Appointing a Committee to assist Council and approving the terms and conditions of members (Section 45);
11. Approving the Institute to make available any discovery, invention or improvement in lieu of payment of fees or royalties (Section 48);
12. Approving the payment of bonuses for discoveries and inventions by officers and employees (Section 49).

FREEDOM OF INFORMATION STATEMENT

The *Freedom of Information Act 1982* (FOI Act) requires each Commonwealth 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 in this annual report, particularly in the section About the Australian Institute of Marine Science (pp. 1-6) and in the Report of Operations: Part C – Institute Structure and Governance (pp. 37-48).

DOCUMENTS AVAILABLE FOR INSPECTION

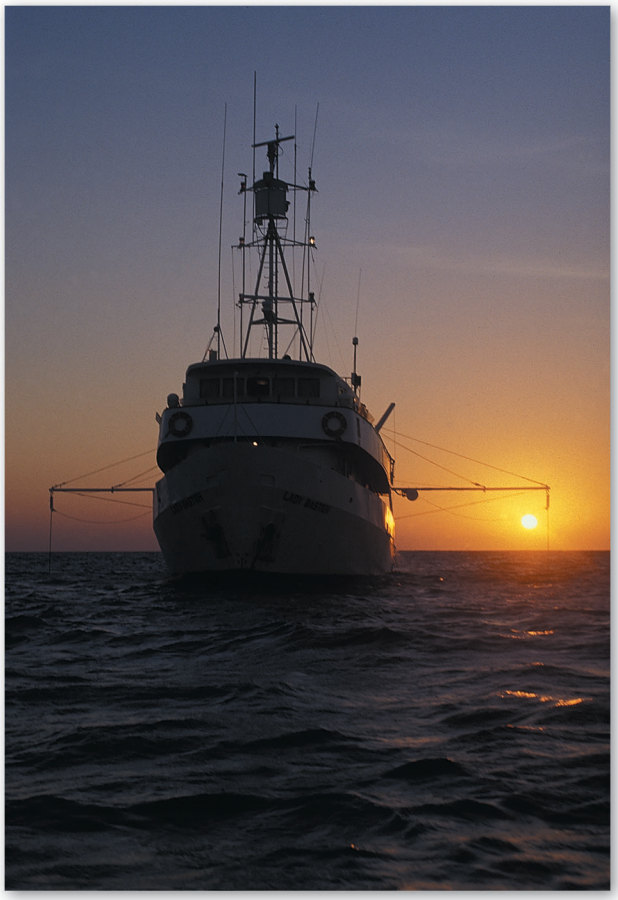
Copies of the Institute's publications and reports are available on request (see table below), generally free of charge except for final project reports. Some other information may be subject to assessment of access for such matters as commercial confidentiality or personal privacy.

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 Qld 4810
Telephone: (07) 4753 4319
Facsimile: (07) 4772 5852

Strategic Directions	Files, publication*
Research Plan	Files, publication*
Annual Operational Plan	Files, unpublished document
Project details	Database, 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 document
Mailing lists	Database

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



SCIENCE PUBLICATIONS LIST 2001

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AIMS SCIENTISTS' MEMBERSHIP OF EXTERNAL COMMITTEES AND NGOs

	Scientist/s	99/00	00/01	01/02
INTERNATIONAL FORUMS				
Biodiversity Convention Scientific Committee (Australian Marine Representative)	Evanslllidge	√	√	√
Chaiyong Limthongkul Foundation, Bangkok, Thailand	Isdale	√	√	√
Continental Margin Task Team (JGOFS, LOICZ)	Brunskill			√
Coral Reef Degradation in the Indian Ocean (CORDIO) Project, Steering Committee	Wilkinson		√	√
Coral Reef Research Advisory Committee, RIS Japan	Heyward	√	√	√
Diversitas – Scientific Steering committee	Done	√		
GMS Pathfinder Committee (NASA)	Skirving	√	√	√
GIWA Advisory Committee	Wilkinson		√	√
Great Barrier Reef Research Foundation – International Scientific Advisory Committee (GBRRF – ISAC)	Wilkinson		√	√
International Coral Reef Initiative - Co-ordination and Planning Committee	Wilkinson	√	√	√
International Coral Reef Action Network – Steering Committee	Wilkinson		√	√
International Society for Reef Studies (Executive)	Done	√	√	√
International Marine Biotechnology Conferences Steering Committee	Battershill		√	
IUCN World Commission on Protected Areas (WCPA) - Marine Biophysical Indicators Working Group (Chair)	Done			√
Marine Bioprocess International Workshops Steering Committee	Battershill		√	√
Packard Foundation, Biodiversity Project for Western Pacific, Steering Committee		√	√	
Palau International Coral Reef Centre Scientific Advisory Committee	Fabricius		√	√
Royal Society of New Zealand Standing Committee for Environmental Research	Battershill	√	√	
Steering Committee, EURESCO Conferences on Marine Coastal Biodiversity	Evanslllidge	√		
Texas A&M University, Department of Land Development and Environmental Planning	Isdale		√	√
UK Ministry of Agriculture, Fisheries and Food	Hall		√	
US National Research Council Advisory Panel	Hall		√	√

	Scientist/s	99/00	00/01	01/02
DOMESTIC FORUMS				
Antarctic Research Assessment Committee	Hall	√	√	√
Australian Academy of Sciences, CLIVAR sub-committee	Lough	√	√	√
Australian Academy of Sciences, Oceans Board	Burns	√		
Australian Academy of Technological Sciences and Engineering (Councillor)	Wolanski		√	√
Australian Coral Reef Society (Executive)	McCook	√	√	
Australian Institute of Commercialisation	Isdale			√
Australian National Sportfishing Association (ANSA), Scientific Research Foundation	Cappo	√	√	√
Australian Ocean Colour Working Group	Skirving			
	Steinberg	√	√	√
Australian Tropical Sciences and Technology Park Pty Ltd	Isdale	√	√	√
Burdekin River Water Allocation Management Plan Technical Advisory Panel (TAP)	Cappo		√	√
Cleveland Bay Consortium	Brunskill	√	√	√
Commonwealth State of the Environment Report, Peer Review Panel	Battershill	√	√	√
CRC Reef Research Centre	Isdale	√	√	√
	Hall			√
CRC Reef Scientific Advisory Group	De'ath	√	√	√
	Done	√	√	√
	Doherty	√	√	√
CRC Reef Task Review Committee	Done	√	√	√
	Doherty	√	√	√
Environment Australia Biodiversity, Access and Benefit Sharing, Review Committee	Evanslllidge	√	√	√
Expert Scientific Committee – GBR Reef Protection IDC	Furnas			√
FRDC Prawn Domestication Steering Committee	Battershill			√
GBRMPA Fisheries Research Advisory Committee	Williams	√	√	√
GBRMPA Representative Areas Program (working group)	Done	√	√	√
	De'ath	√	√	√
GBRMPA Water Quality and Coastal Research Advisory Committee	Furnas	√	√	√
Great Barrier Reef Research Foundation	Isdale			√
International Marine Project Activities Centre	Isdale	√	√	√
Marine Stewardship Council Technical Advisory Committee	Hall			√
National facility (ORV Franklin), Scientific Advisory Committee	Burns	√	√	√
National Oceans Office – SE Bioregionalisation Working Group	Doherty		√	√
QDNR Water Allocation Management Plan, Technical Advisory Panel	Cappo	√	√	√
	Brunskill	√	√	√
QFS – HarvestMac	Doherty	√	√	√
QFS – ReefMac	Williams	√	√	√
QFS – Townsville ZAC	Cappo	√	√	not active
Regional Consultative Group for the Wet Tropics Region Coastal Management Plan	Furnas	√	√	√
Technical Advisory Group – CRC for Catchment Hydrology	Furnas			√
Task Force for Marine Protected Areas	English	√	√	√
The Wetlands and Grassland Foundation	Isdale		√	√
ToxiTech Pty Ltd	Isdale			√
Twin Cities Fish Stocking Society	Cappo		√	√
WA Dept of Environmental Protection-CSIRO Marine, NWS JEMS Technical Advisory Committee	Heyward		√	√
WA Department of Environmental Protection - NW Shelf Environmental Management Project (Technical Advisory Committee)	Heyward		√	√
WA Marine Parks and Reserves Scientific Advisory Committee	Heyward	√	√	√
WA Physical Oceanographic Coordinating Group (WAPOCG)	Steinberg	√	√	√
	Brinkman	√	√	√

WEB ADDRESSES

About AIMS
http://www.aims.gov.au/pages/about.html

AIMS Facilities
http://www.aims.gov.au/pages/facilities.html

AIMS News and Media Releases
http://www.aims.gov.au/news

AIMS ProjectNET for Schools
http://www.aims.gov.au/pages/research/project-net/apnet.html

AIMS Reef Monitoring Database
http://www.aims.gov.au/reef-monitoring

AIMS Remote Weather Stations
http://www.aims.gov.au/weather.shtml

AIMS Research
http://www.aims.gov.au/pages/research.html

AIMS Staff Publications Database
http://whelk.aims.gov.au:2001/publications/jsp/publications/gui/external_pubs_search.jsp

Australian Academy of Technological Sciences and Engineering
http://www.atse.org.au/international/caets.htm

Australian Coastal Atlas
http://www.ea.gov.au/coasts/atlas

Australia Coral Records Research Group (AUSCORE)
http://www.aims.gov.au/pages/auscore/auscore-00.html

Australian Coral Reef Society
http://www.australiancoralreefsociety.org/

Australian Fisheries Habitat Research
http://www.aims.gov.au/pages/research/afhr/afhr-00.html

Australian Hydrographic Service
http://www.hydro.gov.au

Australian Journals Online
http://www.nla.gov.au/ajol

Australian Marine Sciences Association
http://www.uq.edu.au/amsa/

Australian Maritime Safety Authority
http://www.amsa.gov.au

Australian Research Network for Algal Toxins (ARNAT)
http://www.aims.gov.au/arnat/arnat-00001.htm

CRC Reef Research Centre
http://www.reef.crc.org.au

CSIRO Marine Research
http://www.marine.csiro.au/

Bureau of Meterology – Australia
http://www.bom.gov.au

Department of Agriculture, Fisheries and Forestry – Australia
http://www.affa.gov.au

Department of Education, Science and Training – Australia
http://www.dest.gov.au/default.htm

Department of Education, Science and Training (Marine Science)
http://www.dest.gov.au/science/marine/default.htm

Environment Australia
http://www.ea.gov.au/

Fisheries Research and Development Corporation
http://www.frdc.com.au

Foundation of Environmental Conservation
http://www.icef.eawag.ch

Geoscience Australia
http://www.ga.gov.au

Global Coral Reef Monitoring Network
http://www.aims.gov.au/pages/research/coral-bleaching/scr2000/scr-00gcrmn-report.html

Great Barrier Reef Marine Park Authority
http://www.gbrmpa.gov.au

International Centre for Living Aquatic Resource Management (ICLARM)
http://www.iclarm.org/

Intergovernmental Oceanographic Commission
http://ioc.unesco.org/iocweb/

International Union for Biological Sciences
http://www.iubs.org/

James Cook University of North Queensland
http://www.jcu.edu.au

National Library of Australia, Pandora Archive (index page)
http://pandora.nla.gov.au/index.html

National Library of Australia, Pandora Archive, Mariner's Journal
http://pandora.nla.gov.au/tep/25496

National Oceanic and Atmospheric Administration
http://www.noaa.gov/

National Oceans Office
http://www.oceans.gov.au

Queensland Department of Innovation and Information Economy
http://www.iie.qld.gov.au/

Queensland Department of Primary Industries
http://www.dpi.qld.gov.au/home/default.html

Queensland Department of State Development
http://www.sd.qld.gov.au/dsdweb/htdocs/global/frontdoor.cfm

Reefs at Risk
http://www.aims.gov.au/pages/research/project-net/reefs-at-risk/apnet-rar00.html

Science Portal
http://www.science.gov.au/

The National Land and Water Resources Audit
http://www.affa.gov.au/docs/1_nrm/nht_landcare/nht/audit-summary.html

United Nationals Educational, Scientific and Cultural Organisation
http://www.unesco.org/

World Climate Research Program
http://www.wmo.ch/web/wcrp/wcrp-home.html

GLOSSARY

ACRONYMS

AAUQ
Associate Accountant of the University of Queensland

AIMS
Australian Institute of Marine Science

ANU
Australian National University

AO
Officer in the Order of Australia

APFA
Australian Prawn Farmers Association

ATRF
Arafura Timor Research Facility

BRUVs
Baited Remote Underwater Videos

FAICD
Fellow of the Australian Institute of Company Directors

FCA
Fellow of Chartered Accountants

FIEAust
Fellow of the Institution of Engineers, Australia

FOI
Freedom of Information

FRDC
Fisheries Research and Development Corporation

FTSE
Fellow of the Academy of Technological Sciences and Engineering

CALM
Conservation and Land Management (WA Department)

CRC
Cooperative Research Centre

CRC Reef
CRC for the Great Barrier Reef World Heritage Area, operating as CRC Reef Research Centre Ltd

CSIRO
Commonwealth Scientific and Industrial Research Organisation

COTS
Crown-of-thorns starfish

DEST
Department of Education Science and Training (Commonwealth)

DITR
Department of Industry Tourism and Resources (Commonwealth)

EA
Environment Australia

EEO
Equal Employment Opportunity

GBR
Great Barrier Reef

GBRMPA
Great Barrier Reef Marine Park Authority

GCRMN
Global Coral Reef Monitoring Network

JCU
James Cook University

MPAs
Marine Protected Areas

NGO
Non Government Organisation

NOAA
National Oceanic and Atmospheric Administration (United States)

OHS
Occupational Health and Safety

UNESCO
United Nations Educational, Scientific and Cultural Organisation

WA
Western Australia

TERMS

Agrichemical
Artificially produced chemical used in intensive agriculture systems.

Bioactive
Biochemical isolated from an organism with useful activity (e.g. anti-tumor, anti-viral or herbicidal activity).

Biodiscovery
The collection and analysis of organic samples for bioactive compounds.

Biodiversity
The variety of all life forms, including plants, animals and microorganisms, the genes they contain, and the ecosystems they form.

Bioindicators
Biological indicators that can be used to assess environmental quality or physiological stress.

Biotechnology
Technological applications that use biological systems, living organisms or derivatives.

Broodstock
Mature spawners producing juveniles for aquaculture.

Ecosystem
Biological communities and their non-living environment interacting as a functional unit.

Ex situ
Not in the original location.

External earnings
Income made by AIMS from the sale of goods and services, i.e. science publications, contracted research.

Greenhouse (effect)
The trapping of the sun's warmth in the lower atmosphere of the earth by an increase in pollutants such as carbon dioxide and methane.

Holothurians
Sea cucumbers; also referred to as trepang or *beche de mer.*

In situ
In the original location.

Modelling
Numerical techniques and computer technology used to develop a description of a system or phenomenon that accounts for its known properties and can be used for further study of its characteristics.

Outcomes
The results, impacts or consequences of actions by AIMS on the Australian community.

Output
The goods or services produced by AIMS for external organisations or individuals. Output includes goods and services produced for other areas of the Commonwealth public sector.

Primary productivity
The formation of organic matter from inorganic constituents, usually through photosynthesis.

Spin-off
A new company purposely formed to take AIMS and its partners' research products and services through development to market.

Upwelling
The rise to the surface of cold nutrient-rich water from ocean depths.

COMPLIANCE INDEX

ALPHABETICAL INDEX

ALPHABETICAL INDEX