

The research reported herein is based on the 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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Senator The Hon Nick Minchin Minister for Industry, Science and Resources Parliament House Canberra ACT 2600

13 September 1999

Dear Minister

On behalf of the Council of the Australian Institute of Marine Science, I have pleasure in presenting the Institute's 27th annual report for the year ended 30 June 1999. 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 outputs can make an informed judgement of AIMS' performance during the 1998-1999 financial year.

The report has been prepared in accordance with the *Commonwealth Authorities and Companies Orders 1998.* The Council endorsed the content of the annual report, including the report of operations, by a resolution of their meeting of 13 September 1999.

Yours sincerely

A. Lac Making Rogers

A E de Norbury Rogers Chairman Australian Institute of Marine Science

Howeet

Russell Reichelt Director Australian Institute of Marine Science

ABOUT THIS REPORT

This reporting period covers the second year of the three-year (triennium) research plan described in the *AIMS Research Plan 1997-2000*. The report describes the extent to which operations achieved the objectives of the plan noting that it is half way through the research program described therein.

Highlights of research achievements have been included in the report to provide information on the relevance and significance of the Institute's research effort of interest to the Minister, Parliament and users of AIMS research.

1998-99 is the last year of Program Budgeting as government shifts to an accrual-based, outcomes and outputs framework, to be used in the 1999-2000 financial year. Consistent with this shift the report provides an overview of performance information (pages 11-19) which links our output (goods and services) to our agreed outcome¹: *Enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources*.

In accordance with the 1997-2000 Resource Agreement between the Institute and the Ministers for Industry, Science and Resources, and Finance and Administration the report gives details of performance against agreed indicators (pages 20-35). Items complying with the requirements of the Joint Committee of Public Accounts and Audit (Departmental Annual Reports) have also been included – a table of contents; an alphabetical index (pages 112-114); a compliance index (page 111); and a glossary (pages 108-110).

LEGISLATIVE REQUIREMENT

Clause 1 of Schedule 1 of the *Commonwealth Authorities and Companies Act 1997* (CAC Act) and the *Commonwealth Authorities and Companies Orders 1998* governs the content and presentation of this report. Items required for Departmental Annual Reports have been included where appropriate although they are not required of CAC agencies.

FURTHER INFORMATION

This report is available electronically on the AIMS web site (<u>www.aims.gov.au</u>). If you would like to obtain a copy of this report, or other material produced by the Institute, please contact the Science Communication Manager at the Townsville address shown opposite the letter of transmittal.

Details of the types of information available on request and under the provisions of the *Freedom of Information Act 1982* are in Appendix 1.

OTHER PUBLICATIONS AVAILABLE

The *Strategic Directions* document and *Research Plan 1997-2000* are the Institute's peak planning documents and a useful source of information on the Institute and its operations. Both are available from Science Communication at the contact provided above. The Institute provides on-line access to these and other publications. For details visit the AIMS web site (www.aims.gov.au).

¹ Despite the shift to the accrual-based framework in 1999/2000, the Institute's (agency) outcome structure will not change from the Program Budgeting structure.

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About the Australian Institute of Marine Science

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

The Institute's **Mission:** To generate the knowledge to support the sustainable use and protection of the marine environment through innovative, world-class scientific and technological research.

AIMS was established by the federal government in 1972 in recognition of the growing importance of the marine sector to Australia. Its first major laboratory was opened in 1977 at Cape Ferguson, near Townsville. This laboratory is adjacent to the geographic centre of the Great Barrier Reef, Australia's best known natural marine treasure, and one which is highly valued by the general community and marine industries alike.



In 1995 the Institute opened a small laboratory in Dampier, Western Australia, to provide a base for its growing research program in northwest Australia. This program was established to support the conservation and management of the north and west marine zones of Australia, an area that has high conservation value and is rich in oil, gas, fisheries and minerals.

The Institute's research is building the knowledge base for industry development and marine conservation across the northern parts of Australia's Exclusive Economic Zone. Since its beginning in Townsville in 1972, the Institute has become a world centre for interdisciplinary tropical marine science. Our research products are recognised internationally and support government initiatives, such as Oceans Policy and the Marine Science and Technology Plan.

STRATEGIC DIRECTIONS

The planned outcome of AIMS research is "enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources". The research effort contributing to this outcome is focused within five integrated strategic directions:

- The Ocean Environment understanding the circulation of water, nutrients and sediments
- Marine Biodiversity characterising species richness and genetic variety
- Marine Living Resources identifying valuable marine plants and animals
- Ecologically Sustainable Development understanding human impacts in the sea; and
- Technological Innovation developing advanced instruments and techniques

Research Focus

Much of AIMS research is designed to build national capacity in the area of ecologically sustainable development and to meet the challenges of the Commonwealth's Oceans Policy through actions consistent with the companion Marine Science and Technology Plan, with a focus upon the complex marine ecosystems of the tropics. These actions are described in the AIMS *Research Plan 1997-2000* and an updated version of the plan that was released in July 1999. The actions correspond to the following eight key result areas.

1. HUMAN IMPACTS ON COASTAL MARINE ECOLOGY

This multidisciplinary project concentrates on the fate of materials entering the sea from tidal rivers, using knowledge and skills from physical, chemical and biological sciences. It includes long-term monitoring of water quality in the Great Barrier Reef Lagoon, for both excess nutrients and biotoxic pollutants. Recreational and commercial fishing is another type of impact associated with centres of population along the coastal strip.

Research is done in the context of understanding the functioning of healthy ecosystems, especially those of mangroves and seagrasses, which are thought to be biofilters as well as being habitats critical to the productivity of prawns and fish stocks. Our ideas are being tested by comparative studies ranging from the Kimberley region of Western Australia (low population, low rainfall, pristine environment) to the Mekong Delta of Vietnam (high population, high rainfall, high environmental stress) in order to provide a context for ecological sustainability.

2. SUSTAINING CORAL REEFS

This project provides information about the complexity and stability of coral ecosystems, including impacts from cyclones, crown-of-thorns starfish, and the recent coral 'bleaching' phenomenon. The project concentrates on distinguishing 'normal' change (reflecting geographic differences in evolutionary history, biogeographic processes and environmental settings) from changes that are attributable to human impacts. The project disseminates information via means that can be used readily by management organisations both within Australia and overseas. This includes the Institute's senior role within the Co-operative Research Centre for the Great Barrier Reef World Heritage Area, where the tourism and fisheries industries have a significant forum.

3. MONITORING CHANGE IN TROPICAL MARINE BIOTA

This project monitors the status of corals, algae, reef fishes and crown-of-thorns starfish over the Great Barrier Reef. These annual surveys form a primary information source for the Great Barrier Reef Marine Park Authority as well as a basis for understanding the population dynamics and resilience of reef ecosystems.

In addition to the Great Barrier Reef, Australia possesses significant coral reefs in north Western Australia. This region is also the site of rapidly growing industries including fishing, tourism, and petroleum development. During the triennium, the monitoring project has made the first surveys of many of these reefs in order to provide baselines against which to track future changes.

Coral reefs and mangroves are seen increasingly as valuable yet declining resources for coastal communities throughout the tropics. The 1992 United Nations Conference on Environment and Development laid out a plan of action to halt this

decline and called specifically for international co-operation in capacity building. AIMS survey protocols were adopted as the international monitoring standards. As a result, project staff are frequently contracted to train researchers from other countries in these methods and to assist with the interpretation of monitoring data.

4. MARINE BIOGEOCHEMISTRY OF CONTAMINANTS

This project uses organic molecules, trace metals and natural radionuclides to track changes in land use and climate over the past 200 years. Contaminants in the coastal zone from the energy, mining and agricultural industries are used as time tracers to distinguish human-induced impacts from natural environmental change. This project provides specialised consulting services to these major industries.

Three contrasting regions (Northwest Australia, North Queensland, Papua New Guinea) have been selected to represent large and small river input to the coastal zone, and to provide variation in both ocean dynamics and land use history. In addition, AIMS is the lead agency in Project TROPICS. This is an international consortium of coastal oceanographers from Papua New Guinea, Indonesia, USA, and Australia, who have combined resources to understand the transport and fate of terrestrial materials in the coastal seas.

5. SUPPORTING TROPICAL FISHERIES

This project has evolved from mapping diversity and habitats within the Great Barrier Reef to studying the response of fish populations to fishing pressure. Selected sites have been monitored for 20 years to learn how fish populations change over decadal time scales in response to natural disturbances. Such monitoring has identified recruitment as a key process, which in turn has led to a recent focus on fish spawning and larval dispersal. The Great Barrier Reef has been extensively sampled over the past decade to locate preferred nurseries of selected species and to determine travel between spawning sources and recruitment sinks. This work is currently being assimilated into models of water circulation to predict these larval source-sink connections. In addition, new work was started in this triennium to study the dynamics of food chains in tropical coastal waters and their impact on the replenishment process.

The development of robust models of larval connectivity will benefit the management and conservation of fish resources within ecologically sensitive areas, including the Great Barrier Reef. Ultimately, their most beneficial application may be in the design of networks of marine protected areas to sustain fish production. This strategy has strong appeal as the basis for managing the small fisheries of subsistence economies, because more sophisticated input-output controls are unaffordable. This potential is being explored through collaborations with scientists from the Asia-Pacific region.

6. PREDICTING THE COASTAL MARINE ENVIRONMENT

This project is concerned with the role of ocean circulation, waves and associated mixing processes in transporting marine organisms, ocean constituents and pollutants within Australia's tropical shelf waters. It seeks to understand and predict effects on both ecosystems and human-made structures. Consequently, this research supports much of the marine and environmental research undertaken at AIMS including work on biological, chemical and sedimentary processes. The unifying concept is the understanding of fluxes and balances of mass, energy, heat and solar radiation at widely varying scales of space and time.

State-of-the-art computing and visualisation technologies are being used to develop predictive models for these processes.

7. MARINE BIOTECHNOLOGY: MARICULTURE, BIODIVERSITY AND GENETICS

This project uses molecular science and advanced genetic techniques to answer critical questions about the reproduction and genetics of cultured species and to investigate the nature and extent of genetic diversity in wild marine populations. The mariculture component concentrates on molecular regulation of development, growth and reproduction of the giant tiger prawn *Penaeus monodon*. This is the species most commonly farmed throughout south-east Asia, with excellent prospects for further industry growth in tropical Australia.

Work is being done also on the genetics of pearl oysters, giant clams and sea cucumbers, as well as on the reproduction of barramundi.

8. MARINE BIOPRODUCTS

The project screens biochemicals which may be progressed to full development as clinical drugs or other beneficial products. These compounds are being sourced from Australia's marine biodiversity, which represents the richest marine genetic resources in the world. The drug discovery search is complemented by strategic research on biochemical responses to environmental stress. Marine organisms produce chemical signals, venoms, anti-fouling agents, and biochemical means of protection from harmful environments. Understanding how these agents work has wide potential for commercial and biomedical applications. As an example, AIMS is negotiating with a commercial partner to commercialise diagnostic kits to solve the public health nuisance that arises from paralytic shellfish poisoning.

Over the past decade, this project has collected and screened more than 10,000 macroorganisms collected from a wide range of marine environments. During the current triennium, the collection has been expanded by the isolation of an additional 6,000 marine microorganisms. This collection has become a unique and immensely valuable inventory of biodiversity, which will also provide feedstock for many years of biochemical analysis.

Research Approach

Each project adopts a multidisciplinary approach using the synergies created through collaborative research to provide effective output. The multidisciplinary nature of environmental research means that each project often addresses several of the Institute's Strategic Directions.

In developing an improved understanding, we seek to ensure industry and resource managers use our research results wherever possible. To this end, our business development strategies are designed to enable well-planned commercialisation of results of research as appropriate technology transfer opportunities arise.

PERFORMANCE PLANNING AND REPORTING CYCLE

The Institute's research program is developed through extensive consultation (both formal and informal) with its clients (private and public sector and the community). A Reporting and Evaluation Cycle has been implemented across both research and support projects maintaining the quality and relevance of project outputs.

Performance Indicators

The strategic national importance of science and technology (S&T) and the longer-term cycles of research programs do not sit neatly into an annual outcome and output framework. Research output in the reporting year may be the result of a research program begun several, or many, years before the reporting period. Similarly, the links between users of the Institute's research output are often indirect.

AIMS has reported against performance indicators since 1995. These indicators show an ongoing trend in the quality, quantity and effectiveness of the Institute's research products and services.

CLIENTS

The Institute's clients are the users of marine science and technology: the Australian community, industries (predominantly marine), regulators and governments, policy developers, educators, and students.

Government	AIMS provides accurate and impartial advice to the Commonwealth Department of Industry, Science and Resources, Environment Australia, state and local governments.
Researchers	AIMS provides a diverse range of outputs that are used by other scientists and organisations, both nationally and internationally
Petroleum	AIMS provides research services to the oil and gas industry especially in the northwest of Western Australia and the Timor Sea Zone of Cooperation.
Mining	AIMS provides environmental assessments of downstream impacts from coastal mining developments of major proportions.
Tourism	AIMS provides research services to this sector primarily through its partnership in the CRC Reef.
Fisheries	AIMS provides science and advice in support of sustainable fisheries from Australia's northern Continental Shelf, benefiting commercial and recreational fishing and dive-based ecotourism.
Pharmaceuticals, chemical industries	AIMS searches the ocean for novel molecules from marine organisms that can be copied, grown or adapted to provide social and economic benefits for society.
Marine parks	AIMS provides a broad range of information that is relevant to the management and conservation of marine biodiversity.
Education	AIMS informs and trains the next generation of marine scientists. It does this through sponsorship and supervision of student projects, work experience, training workshops, and publication of major texts.
Australian community	AIMS transfers the results of marine science and technology to the community. It does this primarily through popular publications, internet web sites, public exhibitions, and regular contact with the media.

THE SHIFT TO ACCRUAL BUDGETING

AIMS research offers strategic support for the effective use of Australia's valuable marine resources. As part of the shift to the accrual-based outcomes and outputs framework, the Institute reviewed its official functions and the policies of the Government, and proposed the following outcome-output framework for 1999-2000 and the next triennium (2000-2003):



AIMS contributes to this outcome by conducting scientific and technological R&D, providing science facilities and services, and facilitating the application or utilisation of the results of research.

This framework reflects the Institute's primary functions as specified in the AIMS Act (see Appendix 2, pages 89-90). Reporting performance under this framework also reflects existing planning and reporting processes used by the Institute to ensure the relevance, quality and effectiveness of the Institute's research program. Activities planned for 1999-2000 (the last year of the triennium) are identified in the "Australian Institute of Marine Science Research Plan 1997-2000". This document is available on the web at: http://www.aims.gov.au/pages/research/trp/pages/trp2-00.html

Report of Operations

Part A:	Council's Review of Operations and Future Prospects
Part B:	Operational and Financial Results
Part C:	Institute Structure and Corporate Governance Enabling Legislation and Responsible Minister

MARINE SCIENCE OUTCOMES FOR 1998-99 HAVE BEEN INSERTED THROUGHOUT THE REPORT OF OPERATIONS.

Discovery of New Biodiversity Environmental Effects of Land-Based Aquaculture Global Survey of Reef Status Long-term Monitoring of the Great Barrier Reef Coral 'Bleaching' Conservation of Genetic Diversity in the Tropical Indo-Pacific Environmental Impacts of Discharge from Oil Platforms The Impact of Oil Spills on Mangroves and Salt Marshes Ocean Upwelling Drives Food Chains on the North West Shelf Diagnostic Kit to Protect Seafood Consumers Stress Levels in Fish Living Downstream of Agricultural and Urban Catchments Muddy 'Marine Snow' Threatens Inshore Reefs Control of Prawn Reproduction

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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 of the Australian Institute of Marine Science's Annual Report.

Council endorsed the content of the report of operations, which was prepared in accordance with the *Commonwealth Authorities and Companies Orders 1998*, by a resolution of their meeting of 13 September 1999.

A. La Making Roques

A.E. de N. Rogers Chairman 13 September 1999

PART A: COUNCIL'S REVIEW OF OPERATIONS AND FUTURE PROSPECTS

TAKING A NATIONAL PERSPECTIVE ON MARINE SCIENCE

The AIMS research program supports the goals of Oceans Policy and the national Marine Science and Technology (MS&T) Plan. The MS&T Plan, which was released in May 1999 by the Federal Minister for Industry, Science and Resources, provides clear directions for the future of marine science in Australia. The Institute's research is a major pillar of support for this national effort.

Why are the oceans important for Australia? The large Australian Exclusive Economic Zone, extending from the tropics to the Antarctic, is rich in biodiversity and high in natural and cultural heritage value. In addition to appreciating its beauty, Australia uses its oceans to benefit the community. Australia depends on reliable shipping transport for international trade, and earns significant export revenue from its offshore oil and gas production and seafood industries. Tourism based on marine resources is also growing. The Great Barrier Reef alone generates some \$1billion per year for the Australian economy through tourism. The marine sector, depending on how it is defined, is worth \$35bn-\$50bn to the Australian economy each year. Yet the area of our marine jurisdictions is so large, and so remote from land, that much of it remains unexplored.

Marine science and technology provides the knowledge needed to use our marine resources in a sustainable way, and to protect those resources where necessary: the Australian Institute of Marine Science's goal is to provide that knowledge through world's best practice marine scientific research.

The national MS&T Plan was a major initiative, but not all of the significant events during the reporting period were in the policy arena. At the global scale, unusual ocean climate patterns produced a major change across the world's tropical seas. After a particularly hot summer in 1998, tropical waters around the world reached some of the highest levels recorded this century. The temperature exceeded the threshold of tolerance for the microscopic plant cells that live in all reef-building coral tissue, causing the coral to eject these cells from the coral tissue, leading to the phenomenon known as coral 'bleaching'. Some corals recovered, but many did not. By mid-1998 it was clear that the world's coral reefs had suffered major mortality.

The Institute's coral monitoring program has shown that Australia's Great Barrier Reef suffered patchy 'bleaching' effects but was relatively mildly affected compared with many other regions. However, the Institute's coral research in the northwest of Australia found that there was near total death of corals on remote Scott Reef. Beyond Australia, the Institute was involved in tracking this global phenomenon, and will be stepping up its research in the next few years to improve understanding of it, and to develop some options for reseeding depleted reefs where their regenerative capacity is low.

THE INSTITUTE'S MAJOR ACHIEVEMENTS IN 1998-1999

During the reporting period the Institute has again produced high quality scientific information which will support the protection and sustainable development of Australia's marine resources. The number of journal articles, books and conference papers shows a consistent high level of productivity and quality. In addition, the number of papers produced in collaboration with scientists from outside the Institute, both within and outside Australia, is evidence of the high level of cooperation that AIMS researchers pursue with external experts.

1998-99 is the second year of the triennial research plan described in *AIMS Research Plan 1997-2000.* (see summaries of projects on pages 3-5). Research output during the year was consistent with the research plan delivering results across a range of problem areas. This research contributed directly to the Institute's proposed outcome under the accrual-based budget framework. Examples of research achievement during 1998-99 include:

AIMS monitoring of the health of Australian coral reefs detected significant 'bleaching' on parts of the Great Barrier Reef and north Western Australia in early 1998. Satellite measurements of sea temperatures showed that this 'bleaching' followed prolonged exposure to water that was hotter than the historical average. At the worst affected sites, up to 80% of corals died after 'bleaching'. On the Great Barrier Reef, however, significant coral mortality was confined to a minority of reefs in some inshore regions. After a year of monitoring the recovery, recent actions have included information briefings for the tourism industry and management agencies by geographic region. The public has been kept



DISCOVERY OF NEW BIODIVERSITY

During the past 20 years, AIMS scientists have collaborated with colleagues from museums and universities to produce reasonably complete inventories for the larger organisms found on coral reefs. Recently, attention has switched to non-reef habitats and/or very small organisms. An example of the latter is marine mites. Until recently, a single species was described from the Great Barrier Reef. A study funded by the Australian Biological Resources Survey has discovered more than 100 species. More than 90 per cent of these and two of the genera they belong to were completely new to science. This illustrates how much is left to discover if we look in the unexplored places.

informed through numerous media reports and a website. The needs for an additional research response have been met by forming strategic alliances with other agencies to provide better forecasts of future coral 'bleaching', to predict the resilience of reef ecosystems, and ultimately to provide an appropriate risk analysis for the Great Barrier Reef.

- AIMS research showed that large quantities of viable embryos can be harvested from the surface slicks formed after mass coral spawning episodes. After a brief maturation in floating pens, without any need for feeding, these planulae can be delivered to the sea floor to colonise bare areas. This research suggests a mechanism for accelerating the recovery of reefs that have been denuded of coral and/or re-seeding those with little potential for natural replenishment.
- AIMS, in partnership with ICLARM (International Centre for Living Aquatic Marine Resources), is the host organisation for the Global Coral Reef Monitoring Network. With financial support from the US Government, the GCRMN aims to achieve global surveillance over the health of coral reefs. During the year, existing networks in the Caribbean were strengthened and new networks were created in the Western Indian Ocean, East Africa, and South-East Asia. The improved local awareness that should follow from such monitoring can be expected to improve the conservation prospects for coral reefs in many countries.
- AIMS research into land-based aquaculture showed that mangrove-lined creeks are very efficient at capturing the excess nutrients carried in effluent discharged from prawn farms by passing them quickly through food chains into potential fish food. Such rapid trophic conversion should improve the quality of receiving waters flowing into the coastal seas.
- AIMS research showed that when nutrient levels are high, muddy coastal waters can form unusually large particles (flocs) that exceed the capability of corals to cleanse themselves. Under such conditions, corals can be smothered and this newly discovered mechanism may explain an additional threat from terrestrial runoff into coastal seas.

- AIMS strategic studies of marine toxins led to a new cheap assay method. This has been developed into a rapid diagnostic test kit for paralytic shellfish poisoning, which may be developed by a commercial partner. Such a product would help seafood merchants to ensure that their product is safe for consumers.
- The Institute licensed its invention of a new type of computer interface to an Australian technology start-up company, WetPC Pty Ltd, which is pursuing further development of the intellectual property with joint venture partners. While the creation of underwater computers has attracted interest from the defence and petroleum industries, the novel software interface has much wider potential. This is a prime example of a profitable but unpredictable discovery arising from strategic basic research.
- Last year the Institute completed a major review of research priorities for fisheries habitats in Australia. The Fisheries R&D Corporation has adopted these priorities and is promoting them nationally.

ENVIRONMENTAL EFFECTS OF LAND-BASED AQUACULTURE

An AIMS project investigating the fate of nutrients and sediment in effluent from land-based prawn farms has shown that mangroves can provide useful biofilters. Intensive aquaculture, with high animal stocking densities and high rates of feeding, can produce excess nutrients (particularly nitrogen enrichment) in the effluent, which stimulates plant growth when released to waterways. AIMS, with support from the Fisheries Research and Development Corporation, the Aquaculture CRC Ltd, the Australian Prawn Farmers Association, and industry partners, has been investigating the fates and impacts of the discharged material. While dilution and mixing by tidal action allows some to escape into the coastal zone, much of it seems to be processed within the mangrove ecosystem. Bacterial decomposition releases some of the nitrogen to the atmosphere. Another portion is taken up and sequestered within the mangrove trees. Much of the rest seems to be processed through natural food-chains into potential fish food.

GLOBAL SURVEY OF REEF STATUS

AIMS is the host organisation for the Global Coral Reef Monitoring Network (GCRMN), which was established as a prime instrument of the International Coral Reef Initiative (ICRI). A senior scientist from AIMS was chosen to coordinate this network and assist other governments to create regionally based monitoring programs, which will eventually cover all tropical seas. To date, operational networks have been created in the Western Indian Ocean, East Africa, and South Asia; existing networks have been strengthened in areas like the Caribbean, the Pacific and Southeast Asia. Training workshops have been held in Asia and the Pacific based upon the monitoring protocols developed by AIMS for the Great Barrier Reef. In 1998, AIMS published a report summarising the current status of coral reefs of the world and providing regional risk assessments. The US State Department has since affirmed the pivotal role of the GCRMN to ICRI and provided \$A1 million to the United Nations Environment Program to sustain the immediate future of the network.

FACTORS INFLUENCING AIMS' PERFORMANCE

- An IP audit and business planning process during the year revealed a number of new opportunities for promoting commercialisation of our expertise, particularly in the area of marine biotechnology, and the development and exploitation of marine bioproducts.
- During the year a business development group was created focusing on improving the management of the Institute's intellectual property and achieving growth in external earnings.
- ♦ The Institute developed a Y2K Risk Analysis and all critical systems are now fully compliant. The total cost for upgrades to Institute systems was \$70,000.
- Refurbishment funding was allocated in the May 1998 and May 1999 Budget, although the final form of the investment in Institute infrastructure is presently under review.

LONG-TERM MONITORING OF THE GREAT BARRIER REEF

Status Report 3, published in November 1998, summarised six years of monitoring between 1992-1998. In that period, there have been a number of changes in different regions of the Great Barrier Reef. Coral cover on reefs on the outer shelf off Cooktown has increased as the assemblages recover from the effects of Cyclone Ivor in 1990. The diversity of reef fishes has also increased as their habitat returns. In the same region, the number of crown-of-thorns starfish has increased on the mid-shelf and inshore reefs resulting in reduced coral cover. There have been increases in coral cover and fish communities in the southern Great Barrier Reef as the reefs in the Capricorn-Bunker Group recover from extensive storm damage in 1988. Inshore reefs between Cairns and Townsville were severely bleached by hot water in 1998, resulting in substantial coral mortality on some of these reefs. All of these examples are proof of the dynamic cycles of destruction and recovery that are natural for coral communities.

The AIMS Long-Term Monitoring Project is making much greater use of the Internet to report its results. Data on reef fishes, coral cover and crown-of-thorns starfish are checked and added to the central database within days of being collected, which means that natural resource managers can have instantaneous assessments of reef condition as well as a continuous history of change at that location. Visit this site through <u>http://www.aims.gov.au/reef-monitoring</u> for a variety of products on the status and trends of the Great Barrier Reef.

At AIMS the work of the support and administration staff is valued by the scientists, who recognise the importance of working in a team. In the past year we have recruited new staff to build a comprehensive information system for the Institute, integrating the project and corporate databases to give all staff easier access to the information needed to do their work.

Our project diaries and activity accounting systems are simplifying the reporting requirements for servicing external research partners such as the Cooperative Research Centres (CRCs), and the coming year will see more work on making the systems easier to use by the scientists who represent the powerhouse of our productivity.

PARTICIPATION IN SIGNIFICANT PARTNERSHIPS

The Institute's future prospects were affected by several significant events in the past year:

The CRC Reef renewal bid was successful. Although the first Reef CRC was highly productive, the partners¹ decided that the new CRC must develop new goals and

¹ Association of Marine Park Tourism Operators, Australian Institute of Marine Science, James Cook University, Great Barrier Reef Marine Park Authority, Queensland Commercial Fisheries Operators, Queensland Department Primary Industries, and Sunfish.

CORAL 'BLEACHING'

For the past five years, AIMS has monitored the status of coral and fish communities on Scott and Seringapatam Reefs in the Indian Ocean with support from Woodside Offshore Petroleum and Joint Venture Partners.¹ In 1998, there was a severe and widespread 'bleaching' of corals on these reefs down to 30 metres. Subsequent analysis of satellite records of sea temperatures showed that this 'bleaching' was caused by a large pool of hot water (several degrees warmer than the seasonal average) that covered these reefs for more than a month. Follow-up surveys showed that 'bleaching' resulted in the death of around 80 per cent of colonies. Subsequent recruitment surveys found no settlement of new corals, indicating a complete failure of spawning in 1998. This is critical as isolated oceanic reefs like these may have limited external sources of replenishment. The recovery of these communities will be monitored closely over the next few years and new corals will be screened genetically to determine their origins.

Coral 'bleaching' also occurred on the Great Barrier Reef, as part of a global pattern, in 1998. Corals in shallow water and inshore reefs were most affected, and many of these have since died. To place this in perspective, the majority of permanent sites surveyed by the AIMS Long-Term Monitoring Project, representing annual assessments of coral health on more than 50 reefs, showed little or no 'bleaching'. Research has begun to identify the risk of future 'bleaching' in different areas within the Great Barrier Reef, to understand why some corals survive 'bleaching'. Unlike the isolated oceanic reefs of the Indian Ocean, the Great Barrier Reef is an archipelago of many reefs spanning a natural temperature gradient. Its parts are connected by spawn that is dispersed by currents coming from the Coral Sea. Both features should give this ecosystem considerable resilience to localised disturbances.

AIMS is researching alternatives for restoring degraded reefs where natural sources of replenishment are weak or lacking. The majority of corals on Australian reefs spawn in synchrony on a few predictable nights of each year. In 1998, trials on the Ningaloo Reef Tract of Western Australia showed that millions of coral embryos from coral spawn can be harvested and matured in floating pens; then piped directly to the seafloor to re-seed denuded substrate. This illustrates the potential to accelerate the rehabilitation of places severely affected by local mortality, albeit with the natural precaution that applies to all translocations of organisms to foreign places.

¹ Woodside Energy Ltd, BHP Petroleum (North West Shelf) Pty Ltd, BP Developments Australia Pty Ltd, Shell Development Australia Pty Ltd, Chevron Asiatic Limited

emphases: notably, the need to direct research towards producing information needed for ecologically sustainable, profitable industries, and towards the effective management and presentation of the World Heritage values of the Great Barrier Reef region.

- AIMS executed a Deed of Agreement with James Cook University for a Collaborative Research Project concerning the development and commercialisation of a marinederived compound as a valuable agrochemical. This alliance unites the strength of AIMS' compound detection and structural elucidation with the University's leading skills in plant biochemistry.
- AIMS is an active participant in a North Queensland regional initiative which seeks to promote the collective capacities of various R&D organisations in the field of biotechnology. Biotech North represents a collective approach to the establishment of an industry cluster based on the expertise of the participants and the wealth of biodiversity in the region.
- AIMS now participates in the affairs of a new James Cook University technology company, Australian Tropical Science and Technology Park Pty Ltd (A C N 087 052 917), by invited representation at Board level.
- A large collaborative R&D project with the Australian pharmaceutical research company AMRAD was completed on 31 December 1998. The products of that research, if they reach commercial exploitation in the future, will draw a benefit for AIMS through milestone payments and royalties.



CONSERVATION OF GENETIC DIVERSITY IN THE TROPICAL INDO-PACIFIC

Genetic surveys have revealed surprising patterns of variation among different regions of the Indo-Pacific that are inconsistent with the common view that marine species disperse widely and freely on ocean currents. The genetic relatedness of giant clams, starfish and mangroves collected from many countries shows no concordance between patterns of gene flow (indicated by similar genetic profiles) and modern oceanic circulation. This suggests that the patterns of marine biodiversity observed today reflect past (and possibly rare) dispersal events rather than present day processes. If true, some areas may have little resilience to recover from regional threats to biodiversity caused by human activities.

PLANS FOR THE FUTURE

The Institute is currently planning its research for the next triennium (2000-2003). The planning process is based on the framework of the Institute's legislative charter, priorities and needs identified in key policy documents (Oceans Policy and the Marine S&T Plan), input from users of its research and its expertise in tropical systems. Research will focus on issues relevant to the effective management of Australia's marine resources, enhancing scientific knowledge supporting the protection and sustainable development of these resources. The research plan for the next triennium will be finalised early in 2000.

The Institute will be supporting stronger links between marine scientists in Queensland and Western Australia, since both regions have valuable tropical marine resources. Further north, in the Timor-Arafura region, the Institute will investigate ways to capture the benefit of earlier studies in the Great Barrier Reef region and apply these in new areas of importance to Western Australian and Northern Territory governments, noting that this region is also our longest common boundary with another country, Indonesia. This research will be guided towards contributing to the federal government's regional marine planning process that was initiated under the Oceans Policy.

Two strategically important topics for research in the next triennium will be the impact of global climate change on the marine environment and the effects of human land use on the ocean.

AIMS is putting significant energies into the development and implementation of a comprehensive strategy to increase its external earnings capacity. We will build a more effective portfolio of funding sources which includes a strategic mix of income types (grants, consultancies, commercialisation of technologies) and a greater variety of partnerships, while maintaining a strong program of strategic basic research.

In the coming year the Institute will begin refurbishment of the 20 year old Cape Ferguson laboratory and replace its oldest research vessel *RV The Harry Messel*. The new ship will be designed for research on Australia's continental shelf and tropical coastline. Tenderers for design and construction of the vessel are being evaluated.

PART B: OPERATIONAL AND FINANCIAL RESULTS

PRINCIPAL OUTPUT

AIMS produces a wide range of services and products for users of marine research. Indicators of outputs are included below. Selected examples of "marine science outcomes" are presented in the Council's review of operations (previous section) and throughout the report of operations.

MAJOR INVESTING AND FINANCING ACTIVITIES

AIMS has undertaken no investing activities other than those related to normal asset management for an organisation like AIMS, and no financing activities other than those which enable the Institute's outputs to be obtained.

PERFORMANCE INDICATORS

The Institute reports performance against indicators agreed as part of the 1997-2000 Triennium Funding Agreement. The major focus of these indicators is the linkage between AIMS and users of its research. A description of the indicators is included in Appendix 4, pages 106-107.

SHIFT OF RESOURCES TO AGREED PRIORITY AREAS

1998-99 is the second year of the triennium. The Institute regularly liaises with industry and other users of its research to provide ongoing input into the Institute's research planning. While minor adjustments to research outlines in the Research Plan are carried out as required, any major shifts are decided as part of the triennium planning process. The Research Plan for the next triennium (2000-2003) is currently being developed and will be discussed with key stakeholders.

SCIENTIFIC PUBLICATIONS

	96/97	97/98	98/99
Journal/book chapters/articles	76	84	86
Conference proceedings	35	33	48
Technical reports	5	1	9
Consultancy reports	25	20	14
Books/Monographs/Theses	1	3	5
Total	142	141	162

Scientific outputs as measured by publications increased during the reporting period, despite a decline in the number of scientific staff during the triennium.



The range of outputs was very broad (see Appendix 3, pages 91-105), which reflects the multidisciplinary mission of the Institute. The collaborative nature of AIMS' research was reflected by more than half of the scientific publications being co-authored with scientists outside the organisation — a third of the outputs were co-authored with scientists from other countries and a quarter were co-authored with scientists from other institutions within Australia.

PATENTS

The Institute holds 40 deeded patents relating to ultra-violet blocking sunscreen technology. Four patents have been granted up to the reporting date on the WetPC[™]/KORD[™] technologies. In addition, several UV blocker and WetPC[™] patent applications are currently in the national examination phase.

It is anticipated that the last of the UV blocking compound patents will be granted during 1999-2000 and the protection of the WetPC[™]/KORD[™] technologies in the world's major markets will be substantially advanced.

Two PCT applications were made jointly with James Cook University during the year to cover work related to the potential use of novel compounds in agrochemical applications.



Environmental Impacts of Discharge from Oil Platforms

AIMS, in collaboration with the Australian Geological Survey Organisation (AGSO), conducted a study of the distribution and fate of petroleum hydrocarbons released from a shallow-water oil production platform on the North West Shelf. The main source of hydrocarbons is Produced Formation Water (PFW), which is extracted along with the oil from underground, separated from it on the platform, and discharged back to the ocean. Using a wide variety of sensitive measurements taken around the platform, a three-dimensional model was developed to predict the dispersion of the PFW plume. Chemical studies estimated the pathways and rates of degradation of the hydrocarbon traces. Hydrocarbon markers in adjacent bivalve populations and measurements of the growth of microbes in the seawater confirmed the chemistry and validated the model predictions, which indicated an area of potential biological impact up to 1km downstream of the rig. The greatest impacts should occur in surface seawater; however, dispersion and degradation processes are fast enough to prevent any long-term build-up of contamination within the ecosystem. Trials with a new centrifugal separation system during the study period were shown to reduce the levels of oil discharged from the platform to even more acceptable levels.

SCIENTIFIC RECOGNITION

One measure of the impact of the Institute and its research in the national and global context is measured by the recognition by others given to its outputs and/or the prestige of its staff, including distinguished awards.

- AIMS is host, in partnership with the International Centre for Living Aquatic Resource Management in Manila, to the UN-sponsored Global Coral Reef Monitoring Network.
- The TOPEX/Poseidon Science Working Team, which includes remote-sensing scientists from AIMS, was awarded the William T Pecora Award by the US Department of Interior and NASA for contributions to remote sensing science.
- AIMS scientists were invited to fill honorary leadership roles of two learned scientific societies: President of the International Society for Reef Studies, and President of the International Association for Genetics in Aquaculture.

- AIMS scientists were invited to join or continue as Editorial and/or Board Members of some of the best international scientific journals, including:
 - Aquaculture
 - Coral Reefs
 - Estuarine Coastal and Shelf Science
 - Fisheries Oceanography
 - Journal of Marine Research
 - Mangroves and Salt Marshes
 - Marine and Freshwater Research
 - Marine Ecology Progress Series
 - Oecologia
 - Journal of Coastal Research
 - Journal of Marine Systems
 - Oceanography Literary Review, and
 - The UNESCO Encyclopaedia of Life Support Systems

CONTRIBUTION TO AUSTRALIA'S FUTURE THROUGH TEACHING AND TRAINING

Six staff held conjoint or adjunct appointments at universities but many others contributed occasional lectures and seminars. Most scientists supervised postgraduate students (53 during the reporting period) and included them within their research programs. In addition, work experience was offered to a large number of students (high school, undergraduates, postgraduates) either through formal work experience programs or voluntary research positions.

Number of postgraduate students supervised or assisted by AIMS53Number of conjoint teaching positions undertaken with universities6

COORDINATION OF RESEARCH AND LINKAGES WITH DECISION-MAKING BODIES

AIMS places a high priority upon developing and maintaining effective relationships with the users of its research outputs. This includes coordination of research through collaboration and research networks, and linkages with decision-making and educational bodies that facilitate the transfer of knowledge.

Collaboration

The Institute has fostered many strategic partnerships. Since 1993, it has been the major partner in the Co-operative Research Centre for Reef Research (CRC Reef) and, during the year, had this status renewed until 2006. This alliance influences around 20 per cent of the total scientific effort at AIMS to collaborative research with other entities from government (GBRMPA, QDPI, CSIRO), university (JCU, ANU) and industry (AMPTO, QCFO). During the reporting period, another five per cent of AIMS research was committed in a similar manner to the Aquaculture CRC Ltd.

The Institute has always sought and maintained working relations with scientists from the other Commonwealth science organisations (AGSO, ANSTO, CSIRO). During the reporting period, there were 16 active collaborations with scientists from six Divisions of CSIRO, reflecting the multidisciplinary interests of the Institute. Some of these collaborations also included scientists from State government departments in Queensland and Western Australia. For example, staff from the AIMS Long Term Monitoring Project and the WA Department of Conservation and Land Management have instigated a joint project monitoring the health of the Ningaloo Reef Tract, which is the world's largest fringing reef ecosystem.

In 1998-99, AIMS continued to be the lead agency for TROPICS, which is an international multidisciplinary collaboration seeking to aid understanding of sedimentary processes upon continental shelves (<u>http://www.aims.gov.au/tropics</u>). This research involves scientists from the University of Papua New Guinea and the Indonesian Institute of Natural Science, with a broad coalition of academics from American and Australian universities. Another international collaboration was formed during the year among AIMS, GBRMPA and the US National Atmospheric and Oceanic Administration (NOAA) following the global outbreak of coral 'bleaching' in 1998. This coalition will use satellite monitoring of sea surface temperature, ground surveys and modelling to forecast the risk of coral 'bleaching' across northern Australia. A significant amount of AIMS research was also delivered to Asia through bilateral partnerships sponsored by Australian development funds.



Locations of collaborators

THE IMPACT OF OIL SPILLS ON MANGROVES AND SALT MARSHES

Occasionally, oil is spilled accidentally in large volumes into coastal waters. When it washes ashore, mangrove ecosystems are particularly vulnerable, since oil smothers the special breathing roots of these plants. In addition, the lack of oxygen in mangrove sediments can suppress the natural breakdown of hydrocarbons, so that such sediments act as reservoirs leaching oil into the surrounding environment. With support from the Australian Maritime Safety Authority (AMSA) and the Australian Petroleum Production and Exploration Association (APPEA), AIMS simulated oil spills within a condemned construction area near the Port of Gladstone. This study tested the toxicity of different oils on mangroves and the impact of adding nutrients to stimulate bioremediation. The toxicity tests showed that it would be better to disperse oil before it enters the littoral zone but not if the dispersed oil would contact reef communities. The addition of nutrients to stimulate bacteria was found not to improve the breakdown of oil in mangroves because that environment is so anoxic but it did improve survival of the trees. In contrast, the addition of the same nutrients did improve the degradation of spilled oil within salt marshes. All of these findings have been incorporated into AMSA's response plans for dealing with coastal oil spills.

Research covered by these arrangements included aquaculture, fisheries, mangrove forestry and rehabilitation, and pollution.

A summary of collaborations during 1998-99, including collaborations established as part of the researcher network, is given below. The figure on page 24 shows the geographic extent of the Institute's network of collaborators.

Number of national collaborations	73
Number of international collaborations	78
Number of countries with active collaborations	21
Cooperative Research Centres	3

Many of these collaborations, particularly the large ones, are driven on a practical level by the need to share special resources and/or pool expertise. Examples include the mutual sharing of vessels between AIMS and CSIRO (*RV Lady Basten, ORV Franklin*) for coastal and oceanic research, respectively. In Western Australia, the AIMS facility in Dampier is being used as a support base by staff from the State Museum to make detailed studies of the surrounding environment. AIMS facilities on both coasts provide similar access to coastal marine environments for many academics and students, both from Australia and elsewhere.

Input to Policy-Making

Institute representatives served on a number of expert committees set up to advise governments about the development of policy. Commonwealth examples include Oceans Policy and the Marine Science and Technology Plan. State examples include the draft policy on seagrasses issued by the Western Australian Environmental Protection Agency and draft management plans for several Queensland fisheries issued by QFMA. AIMS also made submissions to both levels of government about access to Australia's marine resources and benefit sharing, as the lack of formal agreements continues to be an impediment to the exploitation of biodiversity.

In addition to statutory representation on a number of committees (e.g. Heads of Marine Agencies), the AIMS Director serves as the independent Chair of the Fisheries Research and Development Corporation (FRDC), and the National Oceans Advisory Group (NOAG). He is also a member of the committee responsible for overseeing the State of the Environment Report.

Individual scientists contributed to policy formulation in Australia and elsewhere through membership of government committees and influential NGOs. In 1998-99, the most significant appointments included the International Society for Reef Studies, Oceans Board of the Australian Academy of Sciences, SCOR Working Group on Coral Reefs and Global Climate Change, National Committee for Atmospheric and Ocean Studies, Commonwealth Committee for Marine Protected Areas, Australian Academy of Science CLIVAR sub-committee, DIVERSITAS Scientific Steering Committee for the Year of International Biodiversity Observation, Royal Society of New Zealand Standing Committee for Biodiversity Research, Western Australia Marine Parks and Reserves Scientific Advisory Committee (ministerial appointment), IUBS Reproductive Biology in Aquaculture Committee, International Association for Genetics in Aquaculture, and Royal Society of New Zealand Standing Committee for Environmental Research.

Advice

The Institute provided regular advice through representation on expert committees. Examples include the Task Force for Marine Protected Areas, the Reef Line Fishery Management Advisory Committee, Harvest Fisheries Management Advisory Committee, South East Trawl Management Advisory Committee, Dry Tropics Aquaculture Advisory Group, Regional Consultative Group for the Wet Tropics Region Coastal Management Plan, Technical Advisory Panel of Queensland Department of Natural Resources Water Allocation Management Plan, Steering Committee and Technical Advisory Group for the WA Marine Environmental Management Study. AIMS also presented formal submissions to the Senate Inquiry into Hinchinbrook Channel, and on the environmental effects of ozone depletion to the UNEP Environmental Effects Assessment Panel for the Vienna Convention and the Montreal Protocol. The Great Barrier Reef Marine Park Authority sought advice on crown-of-thorns starfish, coral 'bleaching', dugong protection and the selection of reserves for the protection of biodiversity.



AIMS Director Russell Reichelt, left, at the Canberra launch of a national review of research issues and priorities for marine habitats critical to Australian fisheries, with the major author of the report Michael Cappo, centre and FRDC Executive Officer Peter Dundas-Smith, right. FRDC commissioned the review for its Ecosystem Protection Program.

TECHNOLOGY TRANSFER AND COMMERCIALISATION

Adoption of Practices, Instruments and Processes

The effectiveness of the Institute's transfer of technology to users is evident from the wide range of products adopted by users. Examples for the reporting period are:

- A national review of research on fisheries habitats in Australia (A Review and Synthesis of Australian Fisheries Habitat Research), conducted by AIMS, was launched by the Hon Mark Vaile and the Fisheries Research and Development Corporation (FRDC) in November. Research priorities for fisheries ecosystems were adopted by the FRDC from the report. A copy of the report is available at <u>http://www.aims.gov.au/pages/research/afhr/afhr-00.html</u>
- Following a direction from the Minister for the Environment, GBRMPA has initiated a rapid planning exercise to increase the area highly protected within the Great Barrier Reef Marine Park. Unique data on corals, fish, algae, sediments, ocean currents and nutrients collected by AIMS throughout the Great Barrier Reef over the past 20 years were made available to the

Authority and have been assimilated into large public geographical information systems that will guide the selection of its Representative Areas Program.

- Monitoring protocols developed for the Great Barrier Reef were applied to the Ningaloo Reef Tract of Western Australia: Australia's second largest reef province and the world's largest fringing reef. These protocols were also transferred to many other countries through the Global Coral Reef Monitoring Network (GCRMN) which has adopted the AIMS survey methods as the global standard for monitoring coral reefs.
- AIMS staff trained nationals from Cambodia, China, Myanmar (Burma), Vietnam and Yemen to be able to monitor the status of coral reef resources within their own countries.

OCEAN UPWELLING DRIVES FOOD CHAINS ON THE NORTH WEST SHELF

The abundance of large pelagic plankton feeders such as whale sharks and manta rays in the North West Cape region of Western Australia may be linked to El Niño/La Niña climate variations. Viewing these large animals has become an important part of a valuable local ecotourism industry, but operators had observed that numbers of whale sharks fluctuated from year to year. In March 1999 AIMS completed 10 cruises of *RV Lady Basten* to the North West Cape region, which is adjacent to Exmouth Gulf and the Ningaloo Reef. On each cruise, a multidisciplinary team surveyed plankton communities and measured ecosystem productivity. These measurements also provide "ground truth" for simultaneous observations of water temperature and ocean colour by Earth-orbiting satellites. An array of oceanographic instruments on the continental slope adjacent to North West Cape simultaneously measured water currents and temperatures. These oceanographic measurements revealed the physical mechanisms by which nutrient-rich water from below the surface layer is drawn up and pumped onto the adjacent continental shelf. Upwelled nutrients appear to be an important factor supporting high primary and animal production in the region, which includes the rich prawn fishery in Exmouth Gulf. Differences observed between the two summers covered by the AIMS cruises suggest that oceanographic and meteorological processes affected by El Niño/La Niña have a strong impact on the strength of upwelling in this region, and hence on the supply of plankton to these large marine animals.

- ♦ A prototype CD-ROM interactive image-based training tool for identifying benthic organisms was developed as an adjunct to training in reef monitoring. Version 1 is in production and due for release in December 1999.
- Indonesian scientists were trained in advanced genetic techniques used for stock assessments of fish and invertebrates.
- Techniques that were pioneered on the Great Barrier Reef to study the replenishment of coral reef fish populations were transferred into a development project for the Solomon Islands with sponsorship from the Australian Centre for International Agricultural Research (ACIAR). The project will attempt to create a new artisanal fishery based upon the capture and culture of fish fry for the global aquarium trade.
- Scientific knowledge about the dynamics of corals and reef fish populations was translated into draft management plans for the sustainable development of fisheries controlled by the Queensland Fisheries Management Authority (QFMA).
- Experimental data on the effects of oil, oil dispersants and remediation techniques were assimilated into the national response plans for oil spills promulgated by the Australian Maritime Safety Authority (AMSA).
- Information and advice was transferred directly to industry clients through consultancies into aspects of fisheries, mining, petroleum and tourism.
- ♦ The Minister approved the transfer under licence of the WetPCTM and KORDTM technologies.
- ♦ The Minister approved the transfer under licence for the coral bone substitute technology.

Other Transfer of Knowledge

Presentations

During the year AIMS scientists made approximately 100 presentations of their work to diverse audiences, including industry bodies, environmental agencies, scientific conferences, workshops, schools and community groups. Keynote addresses and/or multiple contributions were made to major international conferences, including: World Aquaculture '99; NCRI International Conference on Scientific Aspects of Coral Reef Assessment, Monitoring and Restoration; International Tropical Marine Ecosystems Symposium; Danish/TCE Project Conference on Rehabilitation of Coastal Zone Ecosystems; Ninth International Symposium on Marine Natural Products; Tenth Symposium on Global Change Studies; and Biotech '99.

Status Reports

- The Status of Coral Reefs of the World: 1998 was published as a guide for policy and decision-makers. The Global Coral Reef Monitoring Network is an intergovernmental initiative currently funded by the US State Department and hosted at AIMS. As a result of this activity, AIMS will update this assessment every two years to monitor progress in conserving the world's reefs.
- Long-term Monitoring of the Great Barrier Reef: Status Report 3 was published. This report summarises data from 1992-1998 on the status and trends in corals, fish and crown-of-thorns starfish over much of the Great Barrier Reef. This information has been made available to a wide audience through an Internet web site: <u>http://www.aims.gov.au/reef-monitoring.</u> This site is now being updated within weeks of new surveys being completed, providing users with almost real-time access to conditions within the Marine Park.

Community Involvement

In Western Australia resident staff have provided support to the local Pilbara schools participating in coastal environment programs. In north Queensland, community groups were assisted with applications for National Heritage Fund (NHT) funding to monitor changes on inshore reefs of significance to local communities. If the funding is provided, AIMS will train and supervise volunteers to ensure quality control of the studies. Other indicators of community outreach are:

- 76 guided tours through AIMS explaining marine science to the public. These tours were conducted by a dedicated group of volunteers, who are given appropriate training upon joining the Institute
- Staffed displays illustrating AIMS research to the public (e.g. various Open Days)
- Participation in the Australian Science Festival held in Canberra (45,000 visitors)
- ♦ Participation in North Queensland Science Education Week
- ♦ Media (radio, TV, newspaper) interviews
External Earnings

During the year AIMS obtained external funds of \$4.89 million, 20.9 per cent of total income. This met the target of 20 per cent. The percentage decreased from 1997/98 due to an increase in total income of \$2 million for infrastructure refurbishment and a drop in external funds of \$0.4 million.



EXTERNAL EARNINGS

^{42%}



DIAGNOSTIC KIT TO PROTECT SEAFOOD CONSUMERS

Paralytic shellfish poisoning is a global public health problem. The toxins in the shellfish come from harmful algal blooms ingested by the animals. A novel protein discovered at AIMS has been used to develop a cheap and rapid bioassay for these toxins. Negotiations are underway with a Canadian biotechnology company to commercialise this discovery through the development and marketing of a simple diagnostic kit. This will allow shellfish farmers, seafood markets, restaurants, and members of the public to test shellfish for the presence of these toxins and to ensure that a safe product is offered to consumers.

The finalisation of a large collaborative research contract with AMRAD Pty Ltd, an Australian pharmaceutical research company, in December 1998 resulted in the drop in external funds.

For the first time in its history, AIMS is in receipt of royalties arising from the licensing of its patented technologies. WetPC Pty Ltd has started to pay royalties on sales of the products of WetPC[™] and KORD[™] technologies to industry clients.

Joint Ventures and Strategic Alliances

- ◇ AIMS signed an agreement with WetPC Pty Ltd (A C N 079 663 488) in which AIMS grants a licence to exploit the technology known as the WetPC[™] technologies. Approximately five years ago AIMS developed an underwater computer, called the WetPC[™]. In essence, it comprises a computer, five-button kordpad as well as a chordic graphical user interface (CGUI) which enables the computer to be controlled underwater using only one hand. The interface (which is the core of the invention) has been protected through lodgement of patent applications in 30 different countries. The technologies have considerable commercial potential. An independent study conducted by the Stanford Research Institute found that no similar technologies are available in the world at the present time.
- Two international Patent Cooperation Treaty (PCT) applications were registered, one concerning the use of corals as bone substitutes, and the other an assay for screening inhibitors of particular enzymes.

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STRESS LEVELS IN FISH LIVING DOWNSTREAM OF AGRICULTURAL AND URBAN CATCHMENTS

Enzyme activity in the livers of fish, particularly ethoxy-resorufin O-deethylase (EROD), is a standard indicator of exposure to contaminants such as organochlorine pesticides. EROD activity in Pikey Bream (*Acanthopagrus berda*) captured in creeks from catchments draining agricultural land in north Queensland was consistently elevated compared with those captured in creeks from undisturbed catchments. Fish collected from one wetland listed under the international RAMSAR convention showed maximum levels, equivalent to those in fish collected from polluted Ross Creek that runs through the middle of Townsville.

- Sunscreen compounds of commercial interest were tested and proven suitable for formulation. The terms of a Commercialisation Agreement have been settled with an Australian company.
- Seafood toxin testing techniques based on the use of a compound that indicates the presence of a particular toxin in shellfish have been evaluated and are under negotiation for commercialisation.
- Early research results from a collaborative research project with James Cook University show that compounds sourced from a marine organism have useful herbicidal activity. A Research Agreement and a Licensing Agreement will be negotiated for the development and transfer of these herbicide technologies to an agrochemical industry partner.

Spin-off Businesses

A new startup technology company, WetPC Pty Ltd (A C N 079 663 488), was formed during 1998 to exploit the technologies developed by AIMS. The Institute has no equity in the entity, but has licensed the underwater computer technology to it.

CUSTOMER SATISFACTION

Nineteen contracts (including grants and consultancies) for AIMS' scientific research services were undertaken successfully during the reporting period. A total of 41 reports were due to be completed during the reporting period as a result of AIMS' externally-funded research or scientific services. All were completed within the report period, although several reports had agreed extensions to submission dates.

A substantial proportion of these was performed with and on behalf of clients who have funded AIMS research in the past.

SIGNIFICANT CHANGES IN PRINCIPAL ACTIVITIES

A significant change in AIMS' research activities during the reporting period arose as a result of the completion of the AMRAD collaborative research project, which had provided significant financial support for AIMS' Marine Bioproducts research for the five years ending 31 December 1998. This has led to a widened search for industry collaborators based on the use of the extensive library of marine natural products samples and compounds at AIMS.

Developments Since the End of the Financial Year

Since the end of the financial year there have been some significant developments in the transfer of AIMS technologies into research and commercial partnerships. These will, when carried through to completion, provide an increasing source of income for research in coming years.

Since the end of the 1998-99 reporting period, AIMS has settled the terms of a transfer of its world-wide patented ultra-violet blocking sunscreen technologies to an Australian technology company. In August 1999, the Minister approved the transfer of the technologies. A commercialisation agreement is expected to be signed during the 1999-2000 reporting period.

AIMS has taken up representation on the board of the newly incorporated technology company Australian Tropical Science and Technology Park Pty Ltd. This company, which is a subsidiary of a James Cook University-controlled entity, will promote the development of a Technology Park in North Queensland.

MUDDY 'MARINE SNOW' THREATENS INSHORE REEFS

New results have shown that when fine mud is re-suspended in nutrient rich water, it may aggregate with the other organic matter to form large flocculates (marine snow). Large flocs settling from the water column can have a detrimental smothering effect upon small coral reef organisms. In contrast, when the same amount of mud is suspended in clean water with low nutrient concentrations, flocculation is minor, and aggregates remain small. Benthic organisms, such as coral polyps, are able to cleanse their exposed surfaces when settling flocs are small, however are unable to cleanse themselves when concentrations are high or flocs are large. This suggests a lethal synergy through which excess nutrients in terrestrial runoff could interact with the natural turbidity of coastal waters to threaten the biota of inshore coral reefs. During the year, refurbishment of the Institute's laboratories at Cape Ferguson continued. To date, the telephonic and electrical systems have been upgraded and a new saltwater pumping station is currently being constructed. An examination of options for marine science effort in the region has also taken place. This resulted in a delay in some aspects of the refurbishment program. On 18 August 1999 the Minister requested AIMS to continue with activities planned for the first year of the program while at the same time commissioning the Chief Scientist, Dr Batterham, to undertake a wider ranging review of marine research needs and activities in the region.

CONTROL OF PRAWN REPRODUCTION

The giant tiger prawn supports a global aquaculture industry worth US\$5 billion and is a growth industry for Queensland valued at over \$30 million last year. At present, the standard method to spawn females is to ablate their eyestalks, which prevents a chemical block to egg maturation. Since only the first few batches of eggs are useable when produced by this method, the industry constantly has to replenish its brood stock from wild populations. The prawn domestication project at AIMS has cloned and sequenced six genes produced by sinus glands in the eyestalks, each the size of a pinhead. One of these is thought to code for a key hormone controlling reproduction. This gene has also been expressed in bacteria, which provides a means of producing large amounts of the peptide for experimental trials to identify its mechanism of action.



PART C: INSTITUTE STRUCTURE AND GOVERNANCE

ENABLING LEGISLATION AND RESPONSIBLE MINISTER

The Australian Institute of Marine Science (AIMS) is a Commonwealth Statutory Authority established by the *Australian Institute of Marine Science Act* of 1972. AIMS reports to the Minister for Industry, Science and Resources, Senator The Hon Nick Minchin.

The functions of the Institute are to carry out research and development in relation to marine science and marine technology and to encourage and facilitate its application and use. These functions are defined in the AIMS Act (see Appendix 2, pages 89-90).

MINISTERIAL DIRECTIONS

During the reporting period, the Minister approved or directed the following in accordance with the *Australian Institute of Marine Science Act* (1972):

- 1. Entry into two contracts for expenditure of more than \$100,000 in any single contract (S. 42)
- 2. The appointment of one person, and the extension of the period of employment of one person who were not Australian citizens by AIMS (S. 32 (2) (a))
- 3. The transfer of AIMS technology under licence (S. 48(1)) in two instances.

INSTITUTE STRUCTURE

COUNCIL

AIMS has a Council of six members including the Director. Members of the Council are appointed by the Governor-General on such terms and conditions as the Governor-General determines. The Director is appointed by the Governor-General on the recommendation of the Council. The terms and conditions of the Director are also determined by the Governor-General.



The organisational structure of the Institute

The Council members holding office at 30 June 1999 were as follows:

Mr A E de Norbury Rogers BCom, AAUQ, FCA, FAICD Chairman *Current term 30/7/1998 - 30/6/2003*

Norbury Rogers is a Chartered Accountant and Company Director and is a Senior Consultant to Ernst and Young (Qld), having spent many years as a Managing Partner and Senior Partner in Ernst and Young (and its predecessors).

He has been a long-standing active member and office bearer of the Institute of Chartered Accountants. He holds a number of directorships including the Board of CSIRO, and is Chairman of Golden Casket Lottery Corporation Limited, Uniquest Limited and Global Seafood Australia Limited. He serves in a number of positions in the public interest, such as a member of the Senate of the University of Queensland, Chairman of the Australian Olympic Games Team Fund Appeal Committee (Brisbane) and is a member of the Salvation Army Education Foundation Committee.

Dr Wendy Craik BSc (Hons), PhD, Grad Dip M'ment, FTSE *Current term 1/7/1997 - 30/6/2000*

Dr Wendy Craik is the Executive Director of the National Farmers' Federation. A fisheries biologist, Dr Craik previously worked for the Great Barrier Reef Marine Park Authority for 17 years, 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.

Dr Craik has extensive experience in public policy, environmental planning, management and research, financial and human resource management. She is a member of the Australian Landcare Council and the Board of the Institute of Land and Food Resources at Melbourne University.

Mr Bruce G McKay BSc (Hons), FIEAust, FAICD Current term 1/7/1997 - 30/6/2000

Mr 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 Chief Executive of the Australian Graduate School of Engineering Innovation from 1994 to 1997. He is a Non-Executive Director of Normandy Mining Limited and the Non-Executive Chairman of Australian Worldwide Exploration NL.

Mr Brian Guthrie BEng, BEcon Current term 30/7/1998 - 30/6/2003

Brian Guthrie commenced his working career at the Townsville City Council as an assistant Engineer and gained experience in all facets of Local Government Engineering.

At that time his last 10 years with the Council were spent as Works Engineer. Brian then moved into private enterprise with a major subsidiary of Brambles Pty Ltd and held the position of National Manager for Government Services.

Owing to family commitments, he moved to the position of General Manager for the Townsville Thuringowa Water Supply Board, a position he held until taking up the appointment as Deputy Town Clerk and Director Corporate Services with the Townsville City Council. For the past five years Brian has held the position of Chief Executive Officer with the Townsville City Council.

Brian has extensive experience at Senior Executive level in government and private enterprise and is the holder of Degrees in Engineering and Economics, and a Masters Degree in Systems.

Dr Merilyn Sleigh PhD, BSc (Hons), Grad Dip Corp M'ment Current term 30/7/1998 - 30/6/2003

Merilyn Sleigh studied pharmacology at Sydney University and worked in the area of molecular genetics for her PhD.

After two years with the pharmaceutical industry, she joined CSIRO, working for over 20 years in Australia and overseas on how genes are regulated, in the context of projects of relevance to the pharmaceutical and agricultural sectors, as well as occupying senior roles in science management. In 1993, she joined small listed pharmaceutical company, Peptech, as its R&D Director, and in 1997 moved to the University of New South Wales. As Dean of the Faculty of Life Sciences, she has strategic responsibility for teaching and research activities spanning a range from psychology to food science, and including substantial teaching and research activities in marine biology.

She is a member of the Boards of two CRCs (Food Industry Innovation and Biopharmaceuticals Research) and a member of the Boards of Food Science Australia (a joint venture between CSIRO and the Victorian Government) and Unisearch Pty Ltd, the technology commercialisation company of the University of New South Wales.

In the past she has been a member of the Genetic Manipulation Advisory Committee, the Biotechnology Committee of the IR&D Board, the Assessment Panel for the Pharmaceutical Industry Investment Plan and the Australian Research Council.

Dr Russell Reichelt BSc (Hons), PhD, FAICD

Director *Current term 17/1/1995 – 18/1/2002*

Dr Reichelt is a marine ecologist with experience in coral reef ecology, ecological simulation and remote sensing. He is presently Chairman of the Board of the Fisheries Research and Development Corporation and adjunct Professor of Biological Sciences at James Cook University and the University of Queensland. Dr Reichelt is interested in the application of science and technology for the benefit of the community, industry and public policy decision-makers. Before appointment as AIMS Director in 1995, he was Director of the Fisheries Resources Branch of the Bureau of Resource Sciences, Canberra. From 1980-1989 he was a marine ecologist at the Australian Institute of Marine Science, conducting research on the Great Barrier Reef.

Council Meetings

The Institute's Council meets four times per year. Members disclose to the Council their connections to other commercial entities, such as Boards, and adhere to a policy on declaring actual or potential conflicts of interest as part of the Council operations.

Council meetings are normally attended by the Institute's Executive Committee to provide advice and consultation. The Council met on the following dates during the 1998-1999 reporting year:

Council meeting number 132 Council meeting number 133 Council meeting number 134 Council meeting number 135		7-8 September 1998 26-27 November 1998 22-23 March 1999 24-25 June 1999		Townsville Townsville Townsville Townsville	
	#132	#133	#134	#135	
Mr Norbury Rogers	~	v	~	~	
Dr Wendy Craik	~	✓	~	~	
Mr Bruce McKay	~	✓	~	~	
Mr Brian Guthrie	×	✓	~	~	
Dr Merilyn Sleigh	~	✓	~	~	
Dr Russell Reichelt	~	v	~	~	

AUDIT COMMITTEE

The Council has an Audit Committee comprising two Council members, one independent member, and the internal auditor, which oversees the Institute's audit strategy and reviews and reports to the Council in connection with the Institute's accounting records. The committee comprises Bruce McKay (Committee Chair), Norbury Rogers (Council Representative), and Roger Dunstan (External Representative, TCM Partners). Vic Bayer (AIMS Finance Manager) is Secretary to the Committee. The Audit Committee's operation is consistent with the Australian National Audit Office *Better Practice Guide*, July 1997.

Audit Committee Meetings

During 1998-99 the Council's Audit Committee held meetings as follows:

7 Se 19 F 27 N	eptember 1998 February 1999 May 1999	Townsville Brisbane Brisbane	
	September 1998	February 1999	May 1999
Mr Bruce McKay	v	✓	~
Mr Norbury Rogers	v	v	~
Mr Roger Dunstan	✓	v	~

EXECUTIVE COMMITTEE

The Executive Committee has five members including the Director who chairs the Committee. During 1998-1999 the Executive Committee included Dr Peter Isdale, Executive Manager (Business and Finance); Dr David McB Williams, Associate Director (Research), replaced by Dr Peter Doherty (Acting); Dr John Veron, Chief Scientist; and Mr Peter Willers, General Manager, Support Services.

STAFF

All Institute staff members are employed under the *Australian Institute of Marine Science Act 1972* (amended 1992). No staff members are employed under the *Public Service Act 1922*. In addition to staff paid from appropriation funds, the Institute employs staff periodically on various projects and schemes that are funded from external sources.

The total staff employed by AIMS during the 1998-99 reporting period (including casuals) was an equivalent full-time value (i.e. staff years) of 162.4 (compared to 166.1 for 1997-98).

LOCATION OF FACILITIES AND MAJOR ACTIVITIES

The Institute's major laboratory is located in Townsville with a small laboratory in Dampier supporting research in the north west of Australia, see map on page 1.



CORPORATE GOVERNANCE

STRUCTURES

The Australian Institute of Marine Science is a Commonwealth Statutory Authority, formed by the *Australian Institute of Marine Science Act* (1972). It is subject to *The Commonwealth Authorities and Companies Act* 1997, reporting to the Minister for Industry, Science and Resources, Senator The Hon Nick Minchin.

The AIMS mission, planned outcome and output, and strategies related to the achievement of these, originate in the AIMS Act. Its strategic priorities are determined by the Council and by the decisions of Government.

The AIMS Council is appointed in accordance with section 12 of the AIMS Act, and is responsible for the overall direction and operation of the Institute. It is committed to the principle of applying the results of the Institute's research for the benefit of the community and of Australian industry and commerce, and to assist the Government in making informed management decisions concerning coastal and marine resources and activities.

The Council ensures effective management through the Director who manages the affairs of the Institute and provides leadership to staff.

An Audit Committee provides advice to the Council in relation to the Institute's finances and financial processes.

PROCESSES

The Council oversees the running of the Institute. It governs the Institute by setting policy, providing review, advice and direction to Institute management (the Director and Executive Committee). The Council also ensures that its finances are audited each year. Ernst and Young conducts an internal audit four times a year, and the Australian National Audit Office conducts an annual external audit.

All members of Council and staff undergo a comprehensive induction process. For the Council, this includes a briefing on the requirements of the CAC Act.

CONTROLS

Council Members' Interests

The Institute's policy on the interests of members of Council is that members must disclose an interest whenever he or she considers that there is a potential conflict of interest. The policy is consistent with the CAC Act (section 21).

In keeping with these Acts, 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 is to declare the existence and the nature of the interest, and is to leave the meeting.

The Council decides when to invite the absent Council Member back to the meeting. Council Members with a direct pecuniary interest will not be invited back to the meeting until discussion on the matter is completed. Council Members with an indirect pecuniary interest will normally be invited back to the meeting to participate in the discussion.

The policy also applies to all members of staff.

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

No incidence of fraud was detected during 1998-1999.

Indemnities and Insurance Premiums for Officers

There are no known liabilities to any current or former officers. During the reporting period, no premium has been paid, or has been agreed to be paid, against a current or former officer's liability for legal costs.

AIMS pays premiums for the Directors and Officers Insurances required under the CAC Act.

Use of Sub-contractors

A sub-contractor is a person or organisation engaged by AIMS to provide a service or product that impacts on the Institute's delivery of its products.

The Institute's policy is to base the selection of sub-contractors on quality, value for money and availability when needed, not necessarily on price.

When the purchase value exceeds \$30,000 tenders will be invited either publicly or selectively, or as the Tender Board determines. Where there is a benefit to the Institute, selective tendering may be approved by the Director. The Tender Board must approve any exemption from public tendering in writing.

Purchases between \$2,000 and \$30,000 will be through selective tender requiring at least three quotations unless the delegated officer determines that the request for quotations is impracticable. The reasons for such a decision must be made in writing.

Purchases of less than \$2,000 are considered routine and the calling of quotations is optional.

Consistent with section 21 of the CAC Act, if a purchase involves the consideration of a member of council or staff member, or an immediate family member of either, the member of Council or staff member is not to be involved in decision-making relating to the purchase.

BEHAVIOUR

The Council requires the Director to extend his or her commitment to good corporate governance – by example and by direction – to all functions of the Institute. The Institute's commitment to best practice is incorporated in its *Strategic Directions* document that recognises the importance of the Institute's staff to the fulfilment of the Institute's mission. Consequently the highest level of staff satisfaction, health and safety must be maintained.

Code of Conduct

AIMS has a Code of Conduct to which the Council, Director 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.

JUDICIAL DECISIONS AND REVIEWS BY OUTSIDE BODIES

None

POLICY AND ADMINISTRATION

EFFICIENCY GAINS

The Institute is striving to improve productivity by minimising administrative details and processes. This year has seen significant development of the Institute's Intranet and the implementation of electronic forms and systems. These measures, along with the streamlined pay/allowance structure of the Certified Agreements have resulted in very worthwhile staff time savings and the elimination of administrative waste.

SOCIAL JUSTICE AND EQUITY

AIMS has a policy of equal employment opportunity. Staff are recruited and promoted on a merit-based system. The following table shows a breakdown of staff gender and funding source.

	Female	Male	Total
Appropriation-funded Staff			
Science	17.1	56.9	74.0
Corporate	13.6	7.7	21.3
Support	9.8	26.3	36.1
Total	40.5	90.9	131.4
Externally-funded Staff			
Science	15.4	14.4	29.7
Corporate	0.3	0.0	0.3
Support	1.0	0.0	1.0
Total	16.7	14.4	31.0
Total Staff	57.2	105.2	162.4

The major policy objectives of the AIMS Equal Employment Opportunity (EEO) Plan include:

- ♦ Increased representation of ATSI staff to 2%
- ♦ 10% of staff employed from a non-English speaking background
- ♦ Increased representation of people with disabilities to 6%
- ♦ Increased representation of female staff to 35%

The majority of these outcomes have been achieved in advance of the year 2000 target, as indicated below (as at 30 June 1999):

Aboriginal and Torres Strait Islander	1%
Non-English speaking background	24%
Staff with a disability	7%
Women	35%

This has altered very little over the past year with an increase of 2% in staff from non-English speaking backgrounds.

Staff, visiting experts, volunteers, Associates and collaborative scientists originating from over 30 countries worked at AIMS during the year. Four per cent of the permanent/fixed term workforce worked part-time. The Institute had no reported cases of harassment.

STAFF CONSULTATION

The Joint Consultative Committee met seven times during the year to discuss and resolve issues of concern between management and staff representatives.

The consultative process with staff is also enhanced by making available all Minutes of internal management committee meetings. In addition, regular staff meetings are held and Intranet bulletins issued where the Director advises staff of organisational and scientific issues.

The Institute's Certified Agreement for the period 1998-2000 was certified in the Australian Industrial Commission on 3 September 1998.

OCCUPATIONAL HEALTH AND SAFETY (OH&S)

The Institute is committed to the principles of OH&S and has had an OH&S Agreement with staff in place since 1994. A replacement OH&S Agreement with staff was established in May 1999. The OH&S Committee met on four occasions and 38 OH&S incidents were reported during the year. None of these incidents were major, but six resulted in time loss from the workplace. The Council reviews OH&S issues regularly.

As part of a three-year Risk Assessment Program, a 12-month OH&S project commenced in September 1998 to investigate safety aspects of the Institute's field operations. Associated with this audit, medical checks have been introduced for all snorkelling activities.

In addition to the weekly OH&S induction and second-tier training sessions, 59 staff attended OH&S refresher courses to reinforce emergency procedures, update information from Safety Officers and stress the need for safety awareness. Thirty-six

staff, contractors, students etc and a further 63 visitors attended general OH&S induction courses during the year. Ninety-nine staff attended 15 safety training courses, which included training in oxygen resuscitation, rescue and marine emergencies. A safety audit was conducted in the main Engineering Workshops.

The Institute's employee assistance program providers, Interlock, reported a reduced rate of counselling activities for the year, 7.5% of staff used the service compared with 8.5% for 1997/98.

FREEDOM OF INFORMATION (FOI)

During 1998-99 no requests were made to the Institute under the provisions of the *Freedom of Information Act* (1982).

The statement required under Section 8 of the FOI Act is at Appendix 1, pages 87-88.

CUSTOMER SERVICE CHARTER

Departments, agencies and Government Business Enterprises which have an impact on the public are required to develop Service Charters in which agencies set standards of service for key undertakings seen as important by customers. This has relevance for work done in delivering research and other services to the private sector. A Charter about this work involves undertakings and standards about the way AIMS offers and provides its services.

During the reporting period AIMS produced a draft Service Charter for dealing with its clients through a process of consultation. The draft Charter has been posted to the AIMS website, and letters sent to selected major clients of the organisation to seek feedback from interested parties.

YEAR 2000 COMPLIANCE

The Audit Committee and Council regularly review the Institute's progress towards Year 2000 compliance and the development of contingency plans. Quarterly reports have been submitted to Government through the Office of Government On-Line (OGO) on the compliance of the major critical systems at the Institute. The report for the end of the 1998/99 financial year shows that all the critical systems at AIMS are now fully Year 2000 compliant and that contingency plans are in place to cover these systems should any unforeseen problems arise.

The major systems which were non-compliant and which were upgraded included:

- ♦ Upgrade of the finance system
- ♦ Minor upgrades to the human resources systems

- ♦ Major upgrade to the telecommunications systems including the central PABX and ISDN systems
- ♦ Replacement of some GPS units
- ♦ Upgrading of some building management software
- Minor upgrades to the central Information Technology systems

The total cost for these upgrades is around \$70 000, of which most was met through our existing maintenance agreements, although the PABX and ISDN upgrades were new costs.

With all of the critical systems compliant and most of the secondary equipment also compliant the risk is now more with suppliers being non-compliant. A Y2K Risk Analysis and Business Continuity Plan has been developed, as has a series of measures to minimise the initial risk to staff.

Advertising and Market Research

AIMS does not undertake significant amounts of advertising. During the year advertising was placed in both print and electronic media for the normal processes of recruitment, requests for tender, and a limited amount of directed advertisements of the Institute's capacities as a collaborative research or commercial partner in particular matters.

During 1998-99 AIMS commissioned a limited amount of market analyses related to potential commercialisation of its technologies.





FINANCIAL STATEMENTS

INCORPORATING:

- ♦ Statement by Directors
- ♦ Independent Audit Report
- ♦ Operating Statement for the year ended 30 June 1999
- ♦ Statement of Assets and Liabilities as at 30 June 1999
- ♦ Statement of Cash Flows for the year ended 30 June 1999
- ♦ Schedule of Commitments as at 30 June 1999
- ♦ Schedule of Contingencies as at 30 June 1999
- ♦ Notes to and forming part of the Financial Statements
- ♦ Supplementary Financial Information for the year ended 30 June 1999

STATEMENT BY DIRECTORS OF THE AUSTRALIAN INSTITUTE OF MARINE SCIENCE

In our opinion, the attached financial statements give a true and fair view of the matters required by Schedule 2 of the Finance Minister's Orders made under the *Commonwealth Authorities and Companies Act 1997.*

A. Pac Making Rooges

A.E. de N. Rogers *Chairman of Council* 13 September 1999

R.E. Reichelt Director and Member of Council 13 September 1999



INDEPENDENT AUDIT REPORT

To the Directors of the Australian Institute of Marine Science

Scope

I have audited the financial statements of the Australian Institute of Marine Science for the year ended 30 June 1999. The financial statements comprise:

- Statement by Directors
- Operating Statement
- Statement of Assets and Liabilities
- Statement of Cash Flows
- Schedule of Commitments
- Schedule of Contingencies, and
- Notes to and forming part of the Financial Statements.

The members of the Board 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 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 Australian Accounting Standards, other mandatory professional reporting requirements and statutory requirements so as to present a view of the entity which is consistent with my understanding of its financial position, the results of its operations 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,

- (i) the financial statements have been prepared in accordance with Schedule 2 of the Finance Minister's Orders; and
- (ii) the financial statements give a true and fair view, in accordance with applicable Accounting Standards, other mandatory professional reporting requirements and Schedule 2 of the Finance Minister's Orders, of the financial position of the Australian Institute of Marine Science as at 30 June 1999 and the results of its operations and its cash flows for the year then ended.

Australian National Audit Office

Allan M Thompson Executive Director

Delegate of the Auditor-General

Canberra 15 September 1999

OPERATING STATEMENT

for the year ended 30 June 1999

	Notes	1999 \$'000	1998 <u>\$</u> '000
NET COST OF SERVICES			
Operating expenses			
Employees	5A	11,202	11,596
Suppliers	5B	9,647	10,056
Depreciation and amortisation	5C	2,158	2,036
Net loss from disposal of assets	5D	34	10
Grants	6	85	157
Total Operating Expenses		23,126	23,855
Operating revenues from independent source	ces		
Sale of goods and services		4,889	5,284
Interest and dividends	7A	498	294
Net gains from sale of assets	7B	11	12
Other		59_	97_
Total operating revenues from independent			
sources		5,457	5,687
Net cost of services		17,669	18,168
REVENUES FROM GOVERNMENT			
Revenues from Government			
Parliamentary appropriations received	8A	18,502	16,388
Total revenues from government		18,502	16,388
Surplus (deficit) of revenue from governm	ent		
over the net cost of services (before abnor	mal item)	833	(1,780)
Abnormal Item			
Valuation of assets	1.5, 7C	3,328	
Surplus (deficit) of revenues from govern	ment		
over the net cost of services (after abnormal i	tem)	4,161	(1,780)
Accumulated surplus (deficit) at beginning of			
reporting period		(5,663)	(3,883)
Accumulated surplus (deficit) at end of			
reporting period		(1,502)	(5,663)

STATEMENT OF ASSETS AND LIABILITIES

as at 30 June 1999

	Notes	1999 \$′000	1998 \$'000
PROVISIONS AND PAYABLES			
Employees	10A	4.244	4 370
Suppliers	10B	501	569
Consultancies and grants	10C	1.114	1.692
Total provisions and payables		5,859	6,631
Total liabilities		5,859	6,631
EQUITY			
Capital	11A	21,890	21,890
Reserves	11B	14,384	14,300
Accumulated deficit	11C	(1,502)	(5,663)
Total equity		34,772	30,527
Total liabilities and equity		40,631	37,158
FINANCIAL ASSETS			
Cash	12A	185	860
Receivables	12C	635	842
Investments	12B	8,500	6,509
Total financial assets		9,320	8,211
NON-FINANCIAL ASSETS			
Buildings and improvements	13A	21,599	22,034
Infrastructure, plant and equipment	13B	8,822	6,437
Inventories	13D	272	274
Other	13E	618	202
Total non-financial assets		31,311	28,947
Total assets		40,631	37,158
Current liabilities		3,826	4,842
Non-current liabilities		2,033	1,789
Current assets		10,210	8,687
Non-current assets		30,421	28,471

STATEMENT OF CASH FLOWS

for the year ended 30 June 1999

Notes	1999 \$'000	1998 \$'000
OPERATING ACTIVITIES		
Cash received		
Appropriations 8A	18,502	16,388
Sale of goods and services	4,475	4,970
Interest	542	249
Other	58	105
Total cash received	23,577	21,712
Cash used		
Grants	(85)	(157)
Employees	(11,321)	(10,406)
Suppliers	(9,975)	(10,514)
Total cash used	(21,381)	(21,077)
Net cash from operating activities 14	2,196	635
INVESTING ACTIVITIES Cash received		
Proceeds from sale of property, plant & equipment	67	10
Total cash received	67	10
Cash used		
Purchase of property, plant & equipment	(947)	(646)
Total cash used	(947)	(646)
Net cash from investing activities	(880)	(636)
Net increase in cash held	1.316	(1)
	-,	(1)
Add cash at 1 July	7,369	7,370
Cash at 30 June	8,685	7,369

Note: Cash at 30 June is dissected as cash and investments. Refer notes 12A and 12B.

SCHEDULE OF COMMITMENTS as at 30 June 1999

	1999 \$'000	1998 \$'000
	<u> </u>	
ВҮ ТҮРЕ		
CAPITAL COMMITMENTS		
Plant and equipment	444	40
Total capital commitments	444	40
OTHER COMMITMENTS		
Operating leases	459	531
CRC Reef	15,669	2,520
Contracts	3,314	4,694
Other	2,344	2,832
lotal other commitments	21,/86	10,577
Total commitments payable	22,230	10,617
Commitments receivable	_	_
Net commitments	22,230	10,617
BY MATURITY		
All net commitments		
One year or less	6,362	6,258
From one to two years	4,070	3,492
From two to five years	7,957	867
Over five years	3,841	
Net commitments	22,230	<u>10,617</u>
Operating lease commitments		
One year or less	346	337
From one to two years	113	181
From two to five years	—	13
Over five years		
Operating lease commitments	459	531

SCHEDULE OF CONTINGENCIES as at 30 June 1999

The Institute is unaware of any damages or legal claims pending against it.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS for the year ended 30 June 1999

Note	Description
1	Summary of Significant Accounting Policies
2	Reporting by Segments
3	Economic Dependency
4	Subsequent Events
5	Goods and Services Expenses
6	Grants Expense
7	Other Revenue/Abnormal Items
8	Revenues from Government
9	Debt
10	Provisions and Payables
11	Equity
12	Financial Assets
13	Non-financial Assets
14	Cash Flow Reconciliation
15	External Financing Arrangements
16	Remuneration of Directors(Councillors)
17	Related Party Disclosures
18	Remuneration of Officers
19	Remuneration of Auditors
20	Financial Instruments

for the year ended 30 June 1999

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

1.1 Basis of Accounting

The financial statements are a general purpose financial report.

They have been prepared in accordance with:

- Guidelines titled Forms of Financial Statements for Commonwealth Authorities and Companies (CAC) Bodies and Commonwealth Authorities and Companies Orders (Amendment) 1998 for the Financial Statements of CAC Bodies issued by the Minister for Finance and Administration in December 1998
- Australian Accounting Standards and Accounting Guidance Releases issued by the Australian Accounting Research Foundation, and having regard to Statements of Accounting Concepts, and
- ♦ the Consensus Views of the Urgent Issues Group.

Except for the change in policy for library publications (as described in Note 1.5), the accounting policies used are consistent with those adopted in the previous year.

The financial statements 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.

1.2 Rounding

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

- * remuneration of directors/(councillors);
- * remuneration of officers; and
- * remuneration of auditors.

1.3 Taxation

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

1.4 Inventories

Inventories held represent stores of consumables and other goods not for resale. Inventories are valued at cost except where they are no longer required, in which case they are valued at net realisable value.

1.5 Property, Plant and Equipment

Purchases of property, plant and equipment are recognised initially at cost in the Statement of Assets and Liabilities, 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). The \$2,000 threshold was selected because it facilitates efficient asset management and recording without materially affecting asset values recognised.

for the year ended 30 June 1999

1.5 Property, Plant and Equipment (continued)

The acquisition of property, plant and equipment free of charge or for a nominal amount is recognised initially at fair value.

The Guidelines require that property, plant and equipment be progressively revalued in accordance with the 'deprival' method of valuation (as set out in the *Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises*) by 1 July 1999 and thereafter be revalued progressively on that basis every three years.

The Institute is implementing its progressive revaluations as follows:

- freehold land and buildings were revalued as at 30 June 1998 and thereafter every three years.
- plant & equipment and ships & vessels were revalued as at 30 June 1999 and thereafter every three years.

Assets in each class acquired after the commencement of the progressive revaluation cycle will be reported at cost for the duration of the progressive revaluation then in progress.

The financial effects of the move to progressive revaluations is that the carrying amounts of assets will reflect current values and that depreciation charges will reflect the current cost of the service potential consumed in each period.

The application of the deprival method values land at its current market buying price and other assets at their depreciated replacement cost. Any assets which would not be replaced or are surplus to requirements are valued at net realisable value; at 30 June 1999, there were no assets in this situation.

All valuations are independent.

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.

The useful lives applying to each class of depreciable asset are as follows:

	1999	1998
Buildings and Improvements	10 to 60 Years	10 to 60 Years
Plant and Equipment	5 to 20 Years	5 to 20 Years

for the year ended 30 June 1999

1.5 Property, Plant and Equipment (continued)

The aggregate amount of depreciation allocated for each class of asset during the reporting period is disclosed in Note 5C.

The Institute has changed its accounting policy for the library publications. Previously, all library publications were expensed to the Operating Statement. In the current financial year, library publications have been capitalised in accordance with the independent valuation described in Note 13B. This change was made to ensure that all property, plant and equipment was recognised in a consistent manner. The effect of change in accounting policy is to increase abnormal items by \$3,328,000.

1.6 Liability for Employee Entitlements

The liability for employee entitlements encompasses provisions 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 employees is 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 1999 and is recognised at its nominal value.

The liability for long service leave is recognised and measured at the present value of the estimate future cash flows to be made in respect of all employees at 30 June 1999. In determining the present value of the liability, attrition rates and pay increases through promotion and inflation have been taken into account.

1.7 Investments

The Australian Institute of Marine Science 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 is included in the investments.

for the year ended 30 June 1999

1.8 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 all such risk and benefits.

Where a non-current asset is acquired by means of a finance lease, the asset is capitalised at the present value of minimum lease payments at the inception of the lease and a liability for lease payments recognised at the same amount. Lease payments are allocated between the principal component and the interest expense. Leased assets are amortised over the period of the lease. As at 30 June the Institute had no finance leases.

Operating lease payments are charged to the Operating Statement on a basis which is representative of the pattern of benefits derived from the leased assets.

1.9 Foreign Currency Transactions

Transactions denominated in a foreign currency are converted at the rate of exchange prevailing at the date of the transaction. At balance date, amounts receivable and payable in foreign currency are translated at the exchange rate prevailing at that date and any exchange differences are brought to account in the Operating Statement.

1.10 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.

1.11 Cash

For the purpose of the Statement of Cash Flows, cash includes deposits held at call with a bank, investments in money market instruments and short term deposits.

1.12 Resources Received Free of Charge

Resources received free of charge are recognised as revenues in the Operating Statement where their fair value can be reliably measured. Use of the resources is recognised as an expense, or, where there is a long term benefit, an asset is recognised. The Institute received no resources free of charge in 1997-98 or in 1998-99.

1.13 Financial Instruments

Accounting policies in relation to financial instruments are disclosed in Note 20.

1.14 Comparative Figures

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

for the year ended 30 June 1999

1.15 Changes in Accounting Policies

Changes in accounting policy have been identified in this note under their appropriate headings.

1.16 Research, Development and Intellectual Property

Costs associated with research and development, intellectual property, patents and trademarks are expensed as incurred.

1.17 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.

1.18 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 unearned income or debtors respectively. Additionally, the Institute used consultants and provided grants to assist research projects.

1.19 Workers Compensation

The Institute discharges its workers compensation liability by payment of annual premium to COMCARE (Commission for the Safety, Rehabilitation and Compensation of Commonwealth Employees), a statutory authority which was formally established to administer the provisions of the *Commonwealth Employees' Rehabilitation and Compensation Act* 1988.

1.20 Schedule of Contingencies

The Institute has included a Schedule of Contingencies, however, there were no known contingencies as at 30 June 1999.

2. REPORTING BY SEGMENTS

The Institute operates in a single industry and geographical segment, being provision of government programs in Australia. The Australian Institute of Marine Science operates in the marine science research industry.

3. ECONOMIC DEPENDENCY

The Institute is dependent on appropriations from Parliament to carry on its normal activities.

for the year ended 30 June 1999

4. SUBSEQUENT EVENTS

5.

5A.

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

	1999	1998
	\$'000	\$'000
GOODS AND SERVICES EXPENSES		
Employee Expenses		
Basic remuneration for services provided	8,565	8,316
Separation and redundancy - abnormal expense	_	105
Related employee expenses:		
Superannuation	1,262	1,220
Provision for annual leave	965	937
Provision for long service leave	295	449
Work related expense allowance	—	255
Recreation leave fare entitlement	_	166
Remote location subsidy	85	72
Workers compensation insurance	30	76
Total employee expenses	11,202	11,596

The separation and redundancy expense was calculated on the basis of 2 weeks pay for every year of service up to 5 years, 3 weeks pay for every year of service from 5 years to 15 years, and 4 weeks pay for every year of service over 15 years, (maximum 77 weeks of pay) plus a transition payment of \$10,000, per employee made redundant.

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 25.6% of salary (CSS) and 11.4% of salary (PSS). An additional 3% is contributed for employee productivity benefits.

for the year ended 30 June 1999

		1999 \$'000	1998 <u>\$</u> '000
5B.	Suppliers Expenses		
	Operating lease rentals	421	402
	Supply of goods and services:		
	Appointment expenses	92	92
	Equipment and software purchases	391	451
	Catering subsidy	77	87
	Cleaning and ground maintenance	172	170
	Communications, telephones, facsimiles, postage	317	274
	Consultancy	484	662
	Consumables	1,024	1,102
	Electricity	294	310
	Freight	146	114
	Fringe benefit tax	128	123
	Fuel, oil, distillates	376	404
	Hire of equipment	517	431
	Insurances	102	115
	Legal expenses	65	185
	Licenses and fees	105	120
	Loss on revaluation	163	_
	Patents and trade marks	81	102
	Publications, journals, subscriptions	383	329
	Rent	82	76
	Repairs and maintenance	1,170	1,678
	Security	131	121
	Training, seminars, conferences	134	149
	Travel and accommodation	1,247	984
	Vessels management and staffing	1,285	1,312
	Victuals	56	49
	Water	82	87
	Other	122	127
	Total suppliers expenses	9,647	10,056
5C.	Depreciation and Amortisation		
	Depreciation of property, plant and equipment	2,158	2,034
	Amortisation of leased assets		2
	I otal expense	2,158	2,036
		1999 \$′000	1998 <u>\$'000</u>
-----	---	----------------	-----------------------
	The aggregate amounts of depreciation or amortisation allocated during the reporting period, either as expense or as part of the carrying amount of other assets, for each class of depreciable asset are as follows:		
	Buildings & improvements	449	611
	Computer equipment	509	459
	Vehicles	62	40
	Mobile plant		4
	Office equipment	49	49
	Ships Jaunchos & vossols	112	703 109
	Library	204	100
	Leased equipment		2
		2,158	2,036
5D.	Net Losses from Disposal of Assets		
	Plant and equipment	34	10
	l otal net losses	34	10
	Net gains from sale of assets in 1998-99 are disclosed in Note	e 7B	
6.	GRANTS EXPENSE		
	Non-profit institutions	85	157
	Total grant expenses	85	157
7.	OTHER REVENUE/ABNORMAL ITEMS		
7A.	Interest		
	Deposits	498	294
	Total interest	498	294
7B.	Net Gains from Sale of Assets		
	Plant and equipment	11	12
	rotai net gains		12
7C.	Abnormal Items	2 220	
	Total Abnormal Item	3,328	

		1999 \$′000	1998 <u>\$'000</u>
8.	REVENUES FROM GOVERNMENT		
8A.	Parliamentary Appropriations Appropriation Acts Nos. 1 & 2, 1998-99 Total government revenue	18,502 18,502	16,388 16,388
9.	DEBT As at 30 June the Institute had no Finance lease liabilities.		
10.	PROVISIONS AND PAYABLES		
10A.	Liabilities to Employees Salaries and wages Annual leave Long service leave Fringe benefit tax Other Aggregate employee entitlement liability	163 1,849 2,133 47 52 4,244	745 1,696 1,889 40 — 4,370
10B.	Suppliers Trade Creditors	<u>501</u> 501	<u> </u>
10C. 11.	Consultancies and Grants Non-profit institutions Overseas entities Profit Institutions EQUITY	563 361 190 1,114	416 159 1,117 1,692
11A.	Capital Capital 1 July Surplus/(deficit) Balance 30 June	21,890 21,890	21,890 21,890
11B.	Asset Revaluation Reserve Asset revaluation reserve 1 July Revaluation for the year Balance 30 June	14,300 <u>84</u> 14.384	1,921 12,379 14,300

		1999 \$′000	1998 <u>\$'000</u>
11B.	Asset Revaluation Reserve (continued) The net revaluation increase in the Asset Revaluation Beserve comprises:		
	Revaluation increment – Buildings and improvements Revaluation increment - Vehicles Revaluation increment - Office equipment Revaluation decrement - Plant & equipment Revaluation increment - Ships, Launches & Vessels Net Revaluation Increase	45 62 (354) <u>331</u> 84	12,379
11C.	Accumulated Results Accumulated 1 July Surplus/(Deficit) Balance 30 June	(5,663) <u>4,161</u> (1,502)	(3,883) <u>(1,780)</u> (5,663)
12.	FINANCIAL ASSETS		
12A.	Cash Cash at bank and on hand Deposits at call	15 170 185	16 844 860
12B.	Investments Term Deposit	<u>8,500</u> 8,500	<u>6,509</u> 6,509
	Balance of cash as at 30 June shown in the Statement of Cash Flows	8,685	7,369
12C.	Receivables Goods and services Provision for doubtful debts	638 (3) 635	845 (3) 842
	Receivables includes receivables overdue by - less than 30 days - 30 to 60 days - more than 60 days	560 73 5_ 638	475 298 <u>72</u> 845

		1999 \$′000	1998 \$'000
13.	NON-FINANCIAL ASSETS		
13A.	Buildings and Improvements		
	valuation 30/6/98 Accumulated depreciation	22,034 449	22,034
		21,585	22,034
	Buildings and improvements at cost	14	—
	Accumulated depreciation	14	
	Total Buildings and Improvements	21,599	22,034
13B.	Plant, Equipment and Other		
	Plant and equipment at independent valuation 30/6/99	2,797	
		2,797	
	Plant and equipment at independent valuation 1/1/95		3,845
	Accumulated depreciation		1,353
	Plant and equipment at cost	—	3,328
	Accumulated depreciation		<u> </u>
	Total plant and equipment	2,797	3,690
	Computer equipment at independent valuation 30/6/99	780	_
		780	
	Computer equipment at independent valuation 1/1/95		1,555
	Accumulated depreciation		<u>1,412</u> 143
	Computer equipment at cost	_	1,924
	Accumulated depreciation		<u> </u>
	Total computer equipment	780	1,099

		1999 \$′000	1998 <u>\$'000</u>
13B.	Plant, Equipment and Other (continued)		
	Vehicles at independent valuation 30/6/99	332	_
	Accumulated depreciation	332	
	Vehicles at cost	_	250
	Total vehicles	332	
	Mobile plant at independent valuation 1/7/95		27
	Total mobile plant		1413
	Office equipment at independent valuation 30/6/99	137	—
	Accumulated depreciation	137	
	Office equipment at independent valuation 1/1/95		253 179
			74
	Office equipment at cost		78 33
			45
	Total office equipment	137	119
	Ships, launches and vessels at independent valuation 30/6/99	1 652	_
	Accumulated depreciation	1,652	
	Shina launahaa and yaaaala at indonandant		
	valuation 31/5/95	_	1,634
	Accumulated depreciation		1,311
	Ships, launches and vessels at cost		55
			33
	Total ships, launches and vessels	1,652	1,344

for the year ended 30 June 1999

	1999 \$'000	1998 \$'000
Library at independent valuation 1/7/98	<u> </u>	<u>\$ 000</u>
Accumulated depreciation	204	
Total library	3,124	
Total plant, equipment and other	8,822	6,437
Total Non-Financial Assets	30,421	28,471

The revaluation of Computer Equipment, Vehicles, Office Equipment, Plant & Equipment, and Ships, Launches & Vessels as at 30 June 1999 was conducted in accordance with the progressive revaluation policy stated in Note 1.

The revaluation of Computer Equipment, Vehicles, Office Equipment, and Plant & Equipment was undertaken by an independent valuer, Mr James Hannah (AVLE) of Herron Todd White.

The revaluation of Ships, Launches and Vessels was undertaken by an independent valuer, Mr G B L Copland (Australian Institute of Marine Surveyors) of Captain B Copland & Associates Pty Ltd.

A net revaluation increment of \$84,141 was transferred to the asset revaluation reserve. A loss on revaluation of \$163,058 for Computer Equipment was expensed (refer Note 5B).

The valuation of library publications as at 1 July 1998 was undertaken by an independent valuer, Mr Mal Missingham (AVLE) of Herron Todd White. The abnormal item in relation to this valuation is disclosed in Note 7C.

Notes to and forming part of the FINANCIAL STATEMENTS

for the year ended 30 June 1999

13C. Analysis of Property, Plant and Equipment

TABLE A Movement summary 1998-99 for all assets irrespective of valuation basis

	Buildings & Improvements \$'000	Plant, Equipment & Other \$'000	Total \$'000
Gross value as at 1 July 1998	22,034	12,949	34,983
Additions	14	1,065	1,079
Library valuation	_	3,328	3,328
Adjustment to accumulated depreciation on revaluation	_	(5,220)	(5,220)
Revaluations - net increment	_	84	84
Revaluations - loss	_	(163)	(163)
Disposals	—	(3,017)	(3,017)
Gross value as at 30 June 1999	22,048	9,026	31,074
Accumulated depreciation as at 1 July 1998	_	6,512	6,512
Depreciation charge for assets held 1 July 1998	449	1,428	1,877
Depreciation charge for additions	_	281	281
Adjustment to cost for revaluation	_	(5,220)	(5,220)
Adjustment for disposals	—	(2,797)	(2,797)
Accumulated Depreciation as at 30 June 1999	449	204	653
Net book value as at 30 June 1999	21,599	8,822	30,421
Net book value as at 1 July 1998	22,034	6,437	28,471

for the year ended 30 June 1999

TABLE B Summary of balances of assets at valuation as at 30 June 1999

	Buildings &	Plant,	Total
	\$'000	s'000	\$'000
As at 30 June 1999 Gross value	22,048	9,026	31,074
Accumulated depreciation	449	204	653
Net book value	21,599	8,822	30,421
As at 30 June 1998 Gross value	22,034	7,314	29,348
Accumulated depreciation	—	4,420	4,420
Net book value	22,034	2,894	24,928

for the year ended 30 June 1999

		1999 \$′000	1998 <u>\$'000</u>
13D.	Inventories Inventories not held for resale (at cost)	272	274
13E.	Other Non-financial Assets Work in progress Prepaid property rental Other	453 	38

14. CASH FLOW RECONCILIATION

Reconciliation of net cash flows from operating activities to Net Cost of Services

Net Cost of Services Revenue from Government Operating Surplus ((Deficit)	(14,341) <u>18,502</u> 4 161	(18,168) <u>16,388</u> (1,780)
Depresiation and amortication of property, plant	4,101	(1,700)
and equipment	2,158	2,036
Increase in salary entitlements	456	1,191
(Increase)/Decrease in other assets	(415)	(27)
(Increase)/Decrease in inventories	2	18
Loss on disposal of assets	34	10
Loss on revaluation	163	_
(Increase)/Decrease in receivables	207	(374)
Increase/(Decrease) in creditors	(1,231)	(404)
Increase in other liabilities	—	8
Profit on sale of assets	(11)	(5)
Increase in other assets	—	(38)
Abnormal item	(3,328)	—
Net cash provided by operating activities	2,196	635

for the year ended 30 June 1999

		1999 \$′000	1998 <u>\$</u> ′000
15.	EXTERNAL FINANCING ARRANGEMENTS		
	The Authority has guarantees with the Commonwealth Bank of Australia totalling:		
	Total facilities Amount of facility used as at 30 June Facility available	1,850 365 1,485	
	There is no provision in the existing arrangements for these facilities to be extended. The facilities are guarantees provided which do not appear on the Statement of Assets and Liabilities.		
16.	REMUNERATION OF DIRECTORS(COUNCILLORS)		
	Aggregate amount of superannuation payments in connection with the retirement of directors	15,868	13,697
	by directors of the Institute Total remuneration received or due and receivable	190,997	169,854
	by the directors of the Institute	206,865	183,551
	Total number of directors of the Institute included in these figures are shown below in the relevant		
	remuneration bands	Number	Number
	\$Nil - \$10,000	4	4
	\$10,000 - \$20,000	1	1
	\$160,000 - \$170,000	_	1
	\$170,000 - \$180,000	<u> </u>	
	Directore/Councillore) of the Australian Institute of Marine	6	6

Science are appointed by the Minister for Industry, Science and Resources.

NOTES TO AND FORMING PART OF THE **FINANCIAL STATEMENTS**

for the year ended 30 June 1999

1998
\$

17. **RELATED PARTY DISCLOSURES**

The Directors (Council members) of the Australian Institute of Marine Science Council, during the financial year, were:

- ♦ Mr N Rogers (Chairman, appointed 30/7/98)
- ♦ Dr R Reichelt (Director, Appointed 17/1/95)
- ♦ Mr B McKay (Appointed 1/7/97)
- ♦ Dr W Craik (Appointed 1/7/97)
- ♦ Mr B Guthrie (Appointed 30/7/98)
- ♦ Professor M Sleigh (Appointed 30/7/98)

The aggregate remuneration of the Directors(Councillors) is disclosed in Note 16.

The aggregate of superannuation payments made in connection with the retirement of Directors was \$15,868 (1997/98 - \$13,697).

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.

		1999 \$	1998 \$
18.	REMUNERATION OF OFFICERS		
	Income received or due and receivable by officers	385,827	482,515
	The number of officers included in these figures are shown below in the relevant income bands :		
	 ♦ \$110,000 - \$120,000 ♦ \$120,000 - \$130,000 ♦ \$130,000 - \$140,000 	Number 2 1 3	Number 2
	The officer remuneration includes all officers concerned with or taking part in the management of the economic entity during 1998-99 except the Director. Details in relation to the Director have been incorporated in Note 16 - Remuneration of Directors(Councillors).		
19.	REMUNERATION OF AUDITORS		
	Remuneration to the Auditor-General for auditing the financial statements for the reporting period	38,500	35,000
	No other services were provided by the Auditor-General during the reporting period.		

for the year ended 30 June 1999

20A. Terms, Condition	ns and A	ccounting Policies	
Financial Instruments	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		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	12A	Deposits are recognised at their nominal value. Interest is credited to revenue as it accrues.	
Receivables for Goods and Services	12B	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 Tems are net 30 days (1997-98 : 30 days)
Term Deposit	12C	The deposit is recognised at cost. Interest is accrued as it is earned.	The deposit is with Australian banks, maturing within 18 months, and earns an effective interest rate of 4.9% payable on maturity.
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.	
Trade Creditors	10B	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.

20. FINANCIAL INSTRUMENTS

Financial Instrument	Notes	Floating Interest Rate	Fixed Interest Rate One Year or Less	Non-Interest Bearing	Total	Weighted Average Interest Rate
		1998-99 \$'000	1998-99 \$'000	1998-99 \$'000	1998-99 \$'000	1998-99 %
Financial Assets (Recognised)						
Cash at Bank	12A	10			10	2.71
Cash on Hand	12A			വ	വ	n/a
Deposits at Call	12A	170			170	3.40
Receivables for Goods & Services	12C			638	638	n/a
Term Deposit	12D		8,500		8,500	4.93
Total Financial Assets (Recognised)		180	8,500	643	9,323	
Total Assets					40,631	
Financial Liabilities (Recognised)						
Trade Creditors	10B			501	501	n/a
Total Financial Liabilities (Recognised)				501	501	
Total Liabilities					5,859	

for the year ended 30 June 1999

20. FINANCIAL INSTRUMENTS (continued)

20B. Interest Rate Risk

....

Notes to and forming part of the Financial Statements

for the year ended 30 June 1999

20. FINANCIAL INSTRUMENTS (continued)

20C. Net Fair Values of Financial Assets and Liabilities

		1998-	99
	Note	Total Carrying Amount \$'000_	Aggregate Net Fair Value \$'000
Financial Assets			
Cash at bank	12A	10	10
Cash on hand	12A	5	5
Deposits at call	12A	170	170
Receivables for goods and services	12C	638	638
Term deposits	12D	8,500	8,500
Total Financial Assets		9,323	9,323
Financial Liabilities			
Trade creditors	10B	501	501
Total Financial Liabilities		501	501

Financial Assets

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

The net fair values 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, which are short term in nature, are approximated by their carrying amount.

20D. Credit Risk Exposure

The Institute's maximum exposures to credit risk at reporting date in relation to each class of recognised financial assets is the carrying amount of those assets as indicated in the Statement of Assets and Liabilities.

The economic entity has no significant exposures 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.

SUPPLEMENTARY FINANCIAL INFORMATION for the year ended 30 June 1999

Unaudited

REVENUE COMPARISON

Comparison of the Institute's revenue since 1996:-

	1999	1998	1997	1996
	\$'000	\$'000	\$′000	\$′000
Consultancies and grants	4,889	5,284	5,494	4,516
Contribution in kind	—	—		143
Interest	498	294	327	452
Other revenue	70	109	44	350
Sub-total	5,457	5,687	5,865	5,461
Appropriation	18,502	16,388	16,445	16,604
Sub-total	23,959	22,075	22,310	22,065
Abnormal item	3,328		_	_
Total	27,287	22,075	22,310	22,065

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 funds target is 20 per cent of total annual income adjusted for unrelated revenue by 30 June 1996. AIMS has exceeded its target since 1995.

External earnings for research is defined as total income less direct appropriation, unrelated revenues and bad debts. External earnings during the last 7 years are :

	\$'000	% of total revenue
1992	2,212	13.4
1993	1,752	11.0
1994	2,512	13.0
1995	4,534	21.5
1996	4,659	21.9
1997	5,494	25.0
1998	5,284	24.4
1999	4,889	20.9

SUPPLEMENTARY FINANCIAL INFORMATION

for the year ended 30 June 1999

UNAUDITED

SOURCE OF EXTERNAL EARNINGS BY INDUSTRY

		1999	19	98
	\$'000	%	\$'000	%
Australian Government	759	15.5	874	16.5
Joint Government/Industry	2,069	42.4	2,271	43.0
International Government	378	7.7	218	4.1
Australian Industry	992	20.3	1,505	28.5
International Industry	691	14.1	416	7.9
	4,889	100.0	5,284	100.0

COOPERATIVE RESEARCH CENTRES (CRCs)

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

Comparison of contribution resulting from CRCs are :-

	1999	1998	1997	1996	1995
	\$000	\$000	\$000	\$′000	\$'000
AIMS contribution <i>in kind</i> to the two					
CRCs were					
CRC Reef Research Centre	1,605	1,499	2,208	1,787	1,660
Aquaculture CRC Ltd	511	543	479	454	93
Research income received from					
CRCs were:					
CRC Reef Research Centre	981	1,260	1,470	1,203	740
Aquaculture CRC Ltd	313	295	323	233	184

EMPLOYEE STAFF YEARS

Comparison of staff years for the last four years are :-

	1999	1998	1997	1996
Science appropriation	74.00	68.81	74.32	80.07
Science external	29.70	39.16	35.45	29.25
	103.70	107.97	109.77	109.32
Support	58.70	58.14	62.07	75.70
Total Institute	162.40	166.11	171.84	185.02

SUPPLEMENTARY FINANCIAL INFORMATION *for the year ended 30 June 1999*

Unaudited

EXPENDITURE BY AREAS

The Institute's total operating expenditure for the year was \$23,126,000, not including expenditure on capital acquisition. The following table shows expenditure in various areas :-

Areas	Variable	Employees	Fixed	т	otal
	\$'000	\$′000	\$′000	\$′000	% to Total
Science projects	3,100	7,192	3,680	13,972	60.4
Corporate	1,252	1,445	(454)	2,243	9.7
Support	5,789	2,565	(1,443)	6,911	29.9
Total Institute	10,141	11,202	1,783	23,126	100.0

Corporate area includes Executive, Financial Services and Human Resources.

Support areas incorporate Information Technology, Laboratory, Field Operations, Workshops, Supply and Property, Information Services and Science Communication.

SUPPLEMENTARY FINANCIAL INFORMATION

for the year ended 30 June 1999

Unaudited

COST OF OUTPUT PER RESEARCH PROJECTS

	Variable	Employees	Fixed	Overhea	ids Total	% of total
	\$'000	\$'000	\$'000	\$'000	\$'000	
Human impacts on coastal marine ecology	0.40		0.45	1.005	0.701	
Appropriation	240	834	645	1,062	2,781	
External	498	348	716	1 506	1,301	17.01
	730	1,102	710	1,500	4,142	17.91
Sustaining coral reefs						
Appropriation	199	770	317	982	2,268	
External	221	315	260	402	1,198	
-	420	1,085	5//	1,384	3,466	14.99
Monitoring change in tropical marine biota						
Appropriation	168	801	277	1,023	2,269	
External	50	59	107	76_	292	11.07
	218	860	384	1,099	2,561	11.07
Marine biogeochemistry of contaminants						
Appropriation	186	617	366	786	1,955	
External	93	9	64	12	178	0.00
	279	626	430	/98	2,133	9.23
Supporting tropical fisheries						
Appropriation	213	748	405	960	2,326	
External	194	106	98	136	534	10.07
-	407	854	503	1,096	2,860	12.37
Predicting the coastal marine environment						
Appropriation	187	444	407	565	1,603	
External	50	99	-28	126	247	
	237	543	379	691	1,850	8.00
Marine biotechnology						
Appropriation	109	650	35	829	1,623	
External	308	358	122	456	1,244	10.00
	417	1,008	157	1,285	2,867	12.39
Marine bioproducts						
Appropriation	167	465	228	594	1,454	
External	144	478	237	610	1,469	
	311	943	465	1,204	2,923	12.64
External - Support	73	91	69	91	324	1.40
Summary						
Appropriation	1,469	5,329	2,680	6,801	16,279	70.40
External	1,631	1,863	1,000	2,353	6,847	29.60
	3,100	7,192	3,680	9,154	23,126	100.00

NB: Overhead is the amount apportionable against Science Research Projects and is the make up of variable and fixed expenditures for both Corporate and Support.

APPENDIXES

APPENDIX 1 - FREEDOM OF INFORMATION STATEMENT

The *Freedom of Information Act 1982* (the "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" (pages 1 - 8) and in the "Report of Operations: Part C – Institute Structure and Governance" (pages 36 - 50).

DOCUMENTS AVAILABLE FOR INSPECTION

The following documents are available for inspectio	n at the Institute:
Strategic Directions	File, publication*

Strategic Directions	File, publication*
Research Plan	Files, publication
Annual Operational Plan	File, 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

*Information is also available on the Internet. The Institute's website address is <u>www.aims.gov.au</u>

Copies of publications and reports are available on request, 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 Old 4810 Telephone: (07) 4753 4319 Facsimile: (07) 4772 5852

APPENDIX 2 - THE INSTITUTE'S LEGISLATIVE FOUNDATION AND THE EXERCISE OF 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*.

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).

APPENDIX 3 - PUBLICATIONS

JOURNALS/BOOK CHAPTERS/ARTICLES

- 1. Alongi DM, Ayukai T, Brunskill GJ, Clough BF, Wolanski E (1998) Sources, sinks, and export of organic carbon through a tropical, semi-enclosed delta (Hinchinbrook Channel, Australia). *Mangroves and Salt Marshes* 2: 237-242.
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- 3. Alongi DM, Tirendi F, Dixon P, Trott LA, Brunskill GJ (1999) Mineralisation of organic matter in intertidal sediments of a tropical semi-enclosed delta. *Estuarine, Coastal and Shelf Science* 48: 451-467.
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MONOGRAPHS, BOOKS AND THESES

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Appendix4 - Triennium Agreement

Performance Indicators

In 1995, AIMS began to trial a set of Performance Indicators as a means of demonstrating the Institute's linkages with users of its research. These performance indicators were established to ensure that external earnings targets did not distort the efforts of the science Authorities and limit them to a narrow range of their overall functions.

A refined set of indicators was agreed as part the 1997-2000 Triennium Resource Agreement signed between AIMS and the Ministers of Finance and Administration and Industry, Science and Resources. The current Agreement was signed in December 1998. Reporting against these indicators is given on pages 20-35.

The indicators included in the 1997-2000 Triennium Resource Agreement are consistent with the Institute's legislative foundation and mission and are a measure of the quality and quantity of the Institute's proposed output - **"Research products and services for users of marine resources".** The indicators also reflect the effectiveness of AIMS output, particularly "Adoption by Users of Practices, Instruments and Processes Developed by AIMS" (Number 7 below).

Indicators in the 1997-2000 Resource Agreement are grouped into areas that reflect major objectives or strategies of government funded R&D.

I. Research and development

To maintain and encourage the highest level of research (both at the national and international levels) which will meet the future needs of industry and other users, and ensure the effective and efficient use of resources to conduct that research.

II. Liaison and collaboration

To encourage the transfer of research outputs through liaison and collaboration with industry, government and other users (including scientific and general communities).

III. Technology transfer and commercialisation

To encourage and facilitate the application of knowledge and technology developed by the Agency by industry and other users, for the maximum long-term benefit to Australia.

IV. Customer satisfaction

To ensure a high level of customer satisfaction.

Achievements against these broad objectives are a measure of the effectiveness of AIMS activities during the reporting period. Indicators of performance agreed for this triennium contribute to our proposed outcome- **"Enhanced scientific knowledge supporting the protection and sustainable development of Australia's marine resources".**

I. Research and development

- Shift of Resources to Agreed Priority Areas Compare the absolute and percentage change in the level of appropriation expenditure in priority areas over the triennium with AIMS' research priority decisions. Also compare for non-appropriation funds and for total funds. Note, AIMS' research priorities are determined by the AIMS Council.
- 2) Scientific Publications
 - (a) Publication level measured by number and categorised by types of publication.
 - b) Number of patents held reported by the number of separate technologies.
- Other Distinguished awards Major prizes Nomination as host agency by internationally recognised researchers.

II. Liaison and collaboration

- 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

6) External Earnings for Research Services, consistent with the Institute's Mission

External earnings gained as a percentage of total funds

- Adoption by Users of Practices, Instruments and Processes Developed by AIMS Selection of internally developed practices, instruments and processes adopted by users in industry, government and the community.
- 8) Joint ventures and strategic alliances A list of joint ventures and strategic alliances, classified by industry sector if this provides additional useful information.
- 9) Spin-off businesses Number and type of businesses spun off.

IV. Customer satisfaction

10) Contracts Successfully Completed Proportion of contracts completed through milestone achievements against the number of reports due for completion in the financial year.

APPENDIX 5 - GLOSSARY

ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
ACRS	Australian Coral Reef Society
AGSO	Australian Geological Survey Organisation
AIMS	Australian Institute of Marine Science
AMPTO	Australian Marine Park Tourist Operators
ANU	Australian National University
APFA	Australian Prawn Farmers Association
APPEA	Australian Petroleum Production and Exploration Association
CLIVAR	Climate Variability and Predictability project (part of World Climate Research Program)
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DIVERSITAS	IUBS/SCOPE/UNESCO Program on Biological Diversity
DISR	Department of Industry, Science and Resources
EEO	Equal Employment Opportunity
FAICD	Fellow of Australian Institute of Company Directors
FCA	Fellow of Chartered Accountants
FCPA	Fellow of Australian Society of Certified Practising Accountants
FIEAust	Fellow of the Institution of Engineers, Australia
FOI	Freedom of Information
FRDC	Fisheries Research and Development Corporation
FTSE	Fellow of the Australian Academy of Technological Sciences and Engineering
GBRMPA	Great Barrier Reef Marine Park Authority
GCRMN	Global Coral Reef Monitoring Network
ICLARM	International Centre for Living Aquatic Resource Management
ICRI	International Coral Reef Initiative
IUBS	International Union for Biological Sciences
JCU	James Cook University

NGO	Non Government Organisation	
NHT	National Heritage Fund	
NOAG	National Oceans Advisory Group	
OH&S	Occupational Health and Safety	
PCT	Patent Cooperation Treaty	
QCFO	Queensland Commercial Fishermen's Organisation	
QDPI	Queensland Department of Primary Industries	
QFMA	Queensland Fisheries Management Authority	
RAMSAR	Convention on Wetlands of International Importance Especially as Waterfowl Habitat	
SOMER	State of the Marine Environment Report	
SCOPE	Scientific Committee on Problems of the Environment	
SCOR	Scientific Committee on Reefs	
TOPEX/Poseidon	Ocean Topography Experiment. A mission to map sea surface heights using two altimeters. TOPEX is the name of the US portion of the mission Poseidon is the name for the French component.	
TROPICS	Tropical River-Ocean Processes In Coastal Settings	
UNEP	United Nations Environment Program	
UNESCO	United Nations Educational, Scientific and Cultural Organisation	
UNCED	United Nations Conference on Environment and Development	
WESTPAC	Intergovernmental Oceanographic Commission program group for the Western Pacific	

GLOSSARY OF TERMS

Agrochemical: artificially produced chemical used in modern, intensive agriculture systems

Anoxic: without oxygen.

Biofilter: biological filter.

Biogeographic: relating to large regions with distinct landscapes/seascapes, flora and fauna (Australia's Oceans Policy, 1998).

Biological Diversity: the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity, June 1992).

Clients: users of marine science and technology including the Australian community, regulators and government, marine industries, policy developers, other researchers, educators and students.

Connectivity: reproductive links among separated populations.

Database: data or information organised in categories to facilitate retrieval and analysis, now commonly in electronic form.

El Niño: climatic conditions caused by unusual eastward currents in the equatorial Pacific Ocean, characterised by higher sea surface temperatures in the Indian and eastern Pacific Oceans, bringing drought to Australia and seasonal climatic anomalies to many countries of the world (Australia's Marine Science and Technology Plan, 1999).

ENSO: El Niño-Southern Oscillation.

Ecosystem: a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (Convention on Biological Diversity, June 1992).

Microorganism: living organism not visible to the naked eye e.g. bacteria, marine fungi and diatoms.

Macroorganism: visible organisms - in the context of this report, algae, sponges and fish.

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

Monitoring: routine counting, testing or measuring, environmental factors or biota to determine their status or condition and to assess changes over time (Australia's Oceans Policy, 1998).

Outcome: the result, impact or consequences of actions by AIMS on the community (DOFA definition for accrual budgeting).

Output: the goods and services produced by AIMS.

Planulae: young free-swimming coral larvae.

Pollution: The introduction by humans, directly or indirectly, of substances or energy into the marine environment, which results or is likely to result in such deleterious effects as to harm living resources and marine life, be hazardous to human health, hinder marine activities, or impair the quality of sea water and reduce amenities (SOMER, 1995).

Strategic basic research: experimental and theoretical work undertaken to acquire knowledge directed towards specified broad areas in the expectation of useful discoveries. It provides the broad base of knowledge necessary for the practical solution of recognised problems (Industry Commission definition, 1994).

INDEXES

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This Annual Report has been prepared using the *Commonwealth Authorities and Companies Orders 1998.* Some of the items included in the *Requirements for Departmental Annual Reports* (updated May 1999) which is issued by the Department of the Prime Minister and Cabinet have been included where they were relevant and improved the access and readability of the report.

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