



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

ANNUAL REPORT

2015-16

AIMS: Australia's tropical
marine research agency.



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The research reported herein is based on early analyses of complex datasets and should not be considered definitive in all cases. Institutions or individuals interested in all consequences or applications of the Australian Institute of Marine Science's research are invited to contact the Chief Executive Officer at the Townsville address below.

For additional copies of this report, please phone AIMS on (07) 4753 4444, write to us at the Townsville address or email media@aims.gov.au.

This report, along with a range of other information about AIMS, is available online at www.aims.gov.au.

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Letter of transmittal



Australian Government



AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE

DARWIN

PERTH

20 September 2016

The Honourable Greg Hunt, MP
Minister for Industry, Innovation and Science
Parliament House
CANBERRA, ACT 2600

Dear Minister,

On behalf of the Council (as the accountable authority of the Australian Institute of Marine Science—AIMS), we have pleasure in presenting our 44th annual report, for the year ended 30 June 2016. The report is forwarded to you in accordance with section 46 of the *Public Governance, Performance and Accountability Act 2013*.

This report provides information so that you, the Parliament of Australia, and users of AIMS' research outputs can make an informed judgement about AIMS's performance during the 2015–16 financial year.

This report has been prepared in accordance with the requirements of the *Australian Institute of Marine Science Act 1972* and in accordance with section 46 of the *Public Governance, Performance and Accountability Act 2013* and with the requirements of the Public Governance, Performance and Accountability Amendment (Corporate Commonwealth Entity Annual Reporting) Rule 2016.

The Council endorsed the content of the AIMS Annual Report 2015–16 by a resolution on 20 September 2016.

Yours sincerely,

The Honourable Penelope Wensley AC
Chairman
Australian Institute of Marine Science

Mr John Gunn
Chief Executive Officer
Australian Institute of Marine Science

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AIMS' Cape Ferguson site, outside Townsville. Image: J. Gioffre (AIMS)

About AIMS

The Australian Institute of Marine Science (AIMS) is a corporate Commonwealth entity established under the *Australian Institute of Marine Science Act 1972* (AIMS Act). As Australia's tropical marine research agency, we conduct innovative, world-class scientific and technological research to support sustainable growth in the use and effective environmental management and protection of Australia's tropical marine estate.

AIMS' headquarters was established near Townsville in recognition of the importance of the Great Barrier Reef to Australia. Today, we also operate from bases in Perth and Darwin, which allows us to undertake research across northern Australia, spanning two oceans and three regional seas (see Figure 1).

To ensure that the outputs of our research are transferred to users, and have the required impact, AIMS actively engages with government (ministers, policymakers, resource managers and environmental regulators), private industry sectors (ports, oil and gas, mining, tourism, services), non-government organisations, scientific peers and the Australian public.

The Institute:

- conducts strategic and applied research into marine life, from microbes to whole-of-ecosystem studies, and the processes that sustain them
- monitors the condition of, and trends in, the marine environment
- builds models and decision-support tools to help users interpret the data we collect
- develops a broad spectrum of enabling technologies that facilitate research at molecular to oceanic scales.

AIMS' research is targeted towards priorities of the Australian and state governments and industry. Over the past year the Institute's research has continued to:

- underpin Australia's environmental management of the Great Barrier Reef to ensure that this World Heritage area remains healthy and resilient
- support the sustainable development of coastal industries and ports across northern Australia from Gladstone to the Pilbara
- provide the environmental baselines and condition and risk assessments required for development of the offshore oil and gas industry in north-western Australia.



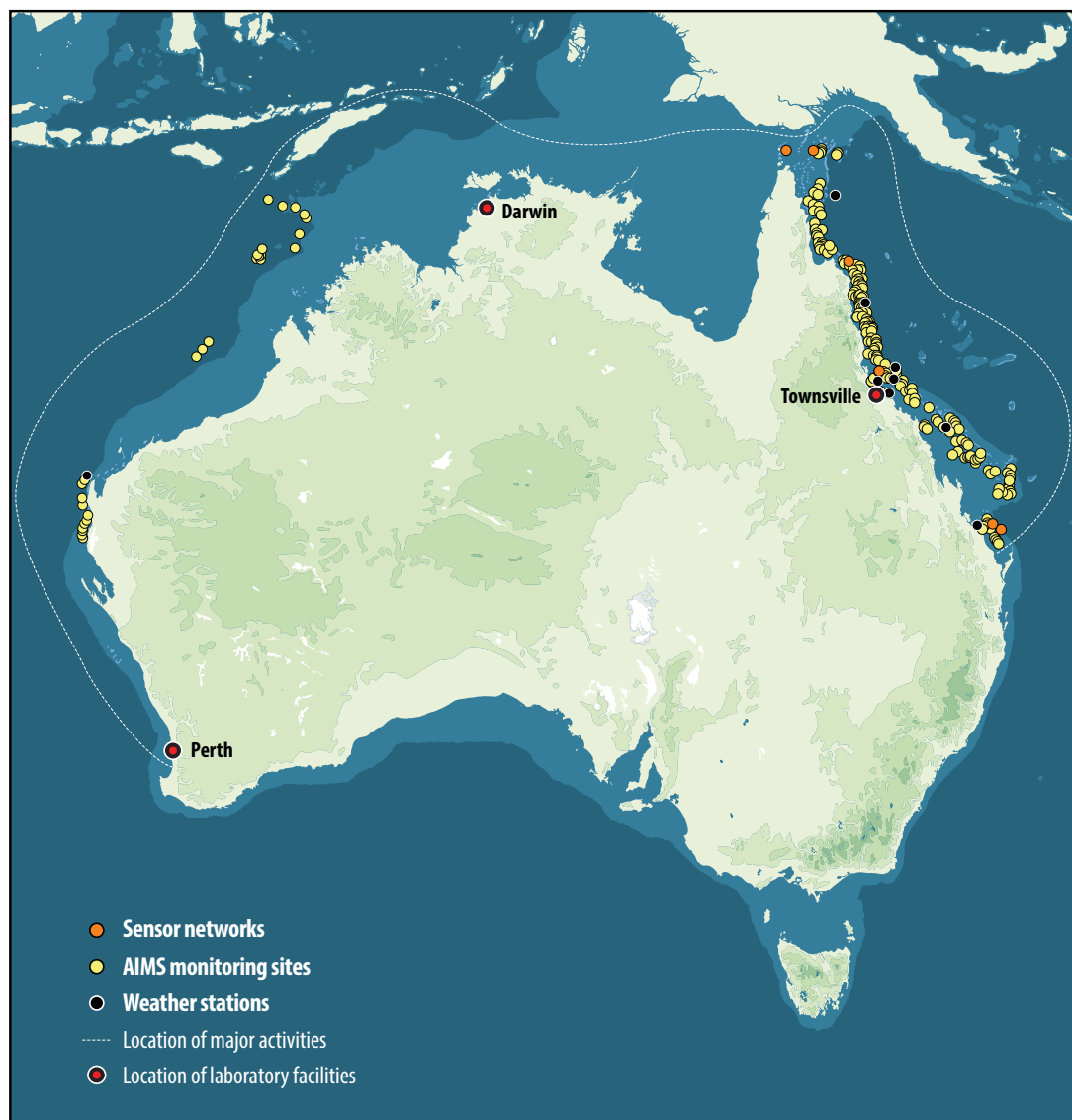


Figure 1: Location of AIMS' major activities and facilities

The year in review: report from Chairman and CEO

Introduction

Australia's tropical north provides substantial environmental, cultural, strategic and economic value to the nation. Remote and sparsely populated, it is recognised internationally for its unique ecosystems, many of which are considered globally important in terms of their biodiversity values.

A jewel in the crown of Northern Australia is its marine estate – from the estuaries and mangrove forests of the coastal fringe, to the coral reefs and broad continental shelf, and out to the oceanic depths hundreds of kilometres offshore. This estate contains the huge offshore oil and gas resources of the north west; valuable fisheries and aquaculture resources; iconic environmental assets such as the Great Barrier Reef, Ningaloo Reef, the Timor Sea Banks and Shoals, Torres Strait Islands and reefs, and the ports that serve as critical gateways for export of gas, minerals and agricultural products.

These tropical resources and assets are the basis for a significant proportion of Australia's marine industries, which in 2012 contributed more than \$47 billion to the national economy¹. They are projected to become even more important as our blue economy grows to \$100 billion per annum by 2025². At the same time, traditional owners of sea country are increasingly recognising the importance of their marine assets and have become active in seeking the sustainable development and conservation of vast tracts of the north Australian coastline.

Achieving sustainable development across multiple industries and sectors, while protecting, and in some cases restoring critical ecosystems, is a major challenge for governments, industry and communities, particularly as climate change rapidly warms and acidifies our oceans.

As Australia's tropical marine science agency, and a global leader in marine research, AIMS has been in the business of providing the evidence base for decision makers in government and industry for over 40 years. Over the last 12 months we have begun full implementation of AIMS' *Strategic Plan 2015–2025*, which is focussed on innovation, research, capability development, provision of data and production of science-based tools and techniques useful for end users.

We have worked hard to maintain our reputation as a trusted adviser, offering independent scientific advice to support informed decision-making by governments, resource managers and marine industries as new investment opportunities are explored. While we pride ourselves on scientific excellence, and a recent independent review of AIMS has affirmed the high quality of our science and strategic directions, the Institute is focussed on ensuring that its science is applied to addressing national priorities, and is delivering value to end-users on the time and spatial scales required. Examples of key science research delivery areas and impact are provided in this annual report.

1 AIMS Index of Marine Industry June 2014 <http://www.aims.gov.au/marine-index-2014>
2 National Marine Science Plan 2015–2025: Driving the development of Australia's blue economy
http://www.marinescience.net.au/fileadmin/user_upload/documents/NMSP_TS_040116_website_update.pdf



AIMS has also demonstrated strong leadership in matters of national importance by playing a leading role in the development of *Marine Nation 2025*³, and the subsequent *National Marine Science Plan*⁴. The Institute provided high level support to development of the Australian Government's National Science and Research Priorities (illustrated in *AIMS Strategic Plan 2015–2025* and *AIMS Corporate Plan 2015–16*); to the National Research Infrastructure Roadmap; and in facilitating industry-based efforts to contribute to the Government's innovation agenda.

The quality, diversity, relevance and value of AIMS' scientific outputs are a direct result of the capability and commitment of its teams of world-class researchers, supported by skilled technical staff and corporate service providers. The ongoing development of systems aimed at improving efficiency, enhancing workplace safety, reducing risk and ensuring relevance of its work, has allowed AIMS to continue to deliver results of international significance.

Working towards a healthy and resilient tropical marine environment

For 30 years, AIMS' Long-Term Monitoring Program has tracked coral cover (a good indicator of reef health) on the Great Barrier Reef (GBR). In 2012, we reported that half the coral cover on the Reef had been lost over the previous 27 years – predominantly due to recurrent cyclone damage, crown-of-thorns starfish (COTS) infestations and coral bleaching.

In late 2015, we were able to report some signs of recovery – coral cover was increasing in both the southern and central sections of the Reef. While the northern section did not share the same trajectory – coral cover had declined by 19 per cent due in part to cyclone damage and a major COTS outbreak – our data showed once again that the system can bounce back when given time and the right environmental conditions.

The optimism driven by these findings was tempered by the onset of a global coral bleaching event in early 2016. Triggered by an intense El Niño weather pattern in the Pacific Ocean, and exacerbated by a period of calm weather, evidence of bleaching was recorded throughout the GBR, to varying degrees throughout the Australian Autumn. Reefs in the northern third of the GBR, from Port Douglas to Cape York, were most seriously affected. The central and southern sections of the Reef sustained significantly lower levels of impact. Bleaching was also reported on Western Australian reefs, particularly the inshore and offshore reefs of the Kimberley region. For example, Scott Reef, a remote reef in the Timor Sea, was severely bleached, with 60–90 per cent of all corals in water down to 30 m affected.

AIMS' response to the bleaching event included an investment in enhanced monitoring at every level, supporting more than 50 ship-days to survey the extent and severity of the impact. Our efforts included dive and manta-tow surveys, coral sampling, deployment of monitoring buoys, aerial and satellite surveillance and enhanced modelling. In December 2016, AIMS scientists will release a synthesis report describing both the distribution and post-event impact on the Reef.

The catastrophic nature of this most recent bleaching event – particularly on reefs that were previously considered relatively well insulated from human-related impacts – brings into sharp focus the need for better understanding of the rapidly-changing marine environment. Disturbance events such as cyclones and COTS outbreaks are natural processes on coral reefs. However, there is concern that, when combined with additional pressures such as reduced water quality, changing ocean chemistry and increased water temperatures, 'reef resilience' – the overall ability of reefs to recover from combined and repeated threats – is rapidly declining. While the individual threats and potential impacts are reasonably well understood, we know comparatively little about the resilience of, and capacity for adaptation in, such a dynamically complex system.

3 *Marine Nation 2025: Marine science to support Australia's blue economy*
http://www.aims.gov.au/documents/30301/550211/Marine+Nation+2025_web.pdf/

4 *National Marine Science Plan 2015–2025: Driving the development of Australia's blue economy*
http://www.marinescience.net.au/fileadmin/user_upload/documents/NMSP_TS_040116_website_update.pdf

AIMS is responding to these challenges by ramping up its research into issues that contribute to reef resilience – both those that reduce it and those that might help to bolster it. In our National Sea Simulator (SeaSim), a world-leading research aquarium, we are running experiments that simulate ocean conditions likely to be encountered 20, 50 and 100 years in the future. We have determined that the predicted levels of ocean acidification (a phenomenon associated with increasing levels of atmospheric carbon dioxide) did not elevate the bleaching susceptibility of some of the most sensitive species of corals. We are testing the inherent genetic capacity of coral to cope with warmer oceans. We have also demonstrated that some corals surviving bleaching events can acquire and host new types of algae from their environment, which may make the coral more heat-tolerant and enhance their prospects for recovery. In addition, we are testing the potential for increased thermal tolerance through selective breeding of corals known to survive better than others in high temperature environments.

This year we advanced scientific understanding of crown-of-thorns starfish, the dispersal of their larvae, and the role that predators might play in controlling populations. Recent research suggests it may be possible to use compounds from Pacific triton snails, one of few known COTS predators, to deter starfish or even to herd them for easier control on selected reefs. We also identified increased larval survival rates following flood events supporting nutrient flows as a key driver for initiation of COTS outbreaks. These discoveries provide hope that strategies might be developed to mitigate future outbreaks.

A scientific paper produced collaboratively in April 2016 by researchers from AIMS and CSIRO showed that current plans for improving water quality on the Great Barrier Reef will not meet the intended targets set by the Australian and Queensland governments. New agricultural products and land uses, and the restoration of coastal rivers and wetlands to improve the ability of catchments to absorb pollutants before they reach the reef, are amongst options discussed in the paper.

The evidence gathered through these, and other studies, will provide the basis for informed decision-making about management of coral reefs under future climate conditions and will be particularly important for implementation of the *Reef 2050 Long-Term Sustainability Plan* and the associated Reef 2050 Integrated Monitoring and Reporting Program.

Helping marine-based industry to operate effectively and sustainably

Falling prices made the past year a challenging one for Australia's offshore oil and gas industry. Nevertheless, many of the companies operating on the North West Shelf continued their strong partnerships with AIMS: Woodside, Shell Australia, Chevron, INPEX, ConocoPhillips and Quadrant all continued to use AIMS' marine environmental survey capabilities and its capacity to develop knowledge to support the assessment and management of operational and business risks. While such partnerships provide an obvious benefit to resource industry operators, they also provide a broader benefit to Australia: they facilitate the creation of new knowledge to support the ongoing development of management and regulatory frameworks and policies by both Australian and State governments.

Over the past 20 years, AIMS has worked closely with partners across many industries to generate the baseline research, knowledge and tools to tackle the marine science issues they face, both now and in the future. For example, Chevron's Gorgon Project, based on Barrow Island off the northwest coast of Western Australia, is one of the world's largest natural gas projects. By the time the first shipment left the new plant in March 2016, Chevron Corporation had invested \$34 billion in local goods and services and created as many as 10,000 jobs.

Barrow Island is classified as a Class 'A' Nature Reserve (the most protected type of Crown land in Western Australia) so all operations are required to adhere to strict environmental standards. The project required dredging works to be completed in the vicinity of the Island, but there was little pre-existing scientific evidence upon which the WA Environmental Protection Agency could establish appropriate guidelines for dredging operations. Such knowledge gaps are a key target for AIMS in its efforts to support industry. AIMS is currently leading the Western Australian Marine Science Institution (WAMSI) Dredging Node – a five-year, \$19 million government- and industry-funded project aimed at understanding the processes, dynamics and potential impacts of dredging operations in marine environments. The lab-based simulations and experiments are being conducted at SeaSim, located at AIMS headquarters in Townsville. By leveraging off the knowledge base being developed by the dredging node, AIMS was able to determine the potential damage to Barrow Island's marine ecosystems, and recommend ways to mitigate the damage.

In the Northern Territory, a targeted study that illustrates our end-to-end response to issues was initiated. Northern Territory barramundi contain varying levels of naturally-occurring mercury. AIMS researchers worked with Indigenous rangers and Northern Territory fisheries experts to determine the distribution and cause of mercury in the environment. We developed a new approach to assessing chronic biological effects of pollutants on three indicator species: barnacles, dog whelks and hermit crabs, and tested the toxicity of aluminium, gallium, molybdenum and other compounds of concern in the tropics.

Further afield, we have supported new baseline assessments for Ningaloo and Shark Bay and other marine reserves, and discovered new species in partnership with the Western Australian Museum, Museum Victoria and CSIRO. Our research also expanded knowledge of the effects of an oil spill dispersant on seven tropical marine species, and identified the impact of coal particles on corals.

The impact of new ports and other coastal infrastructure arguably is one of the hottest issues relating to the development of sustainable industries across Australia's north. Ports are expanding throughout South-East Asia: currently Indonesia is creating six new hub ports, and China's ports continue to grow. However, most of the existing scientific literature relating to the impact of port development is based on studies in colder northern hemisphere waters, such as the North Sea and Arctic waters. AIMS researchers are working to provide a tropical context for existing knowledge and develop new information to guide government and industry in managing coastal ecosystems and development.

AIMS expertise continues to contribute value to the Gladstone Healthy Harbour Partnership 'Report Card' system. This holistic approach to assessing and reporting the overall health of the harbour's marine environment, demonstrates AIMS' rapidly expanding capacity to contribute to better understanding of these complex systems. This is essential for providing the knowledge needed to support sustainable use and to develop tools to allow others to manage resources effectively and responsibly.

An ongoing contribution on many fronts

Our ability to deliver new knowledge to support the environmentally sustainable development of Australia's tropical marine assets is underpinned by: the quality of our science; the excellent infrastructure and staff who support the work of our science teams; and our national and international leadership in marine science.

During 2015–16 our science staff published 186 papers in scientific journals, including high profile pieces in *Nature*, *Science* and the *Proceedings of the National Academy of Sciences*. We supported the development of 84 early career researchers and participated in 159 collaborative projects with researchers across Australia and the world. The volume of data held by AIMS and – more importantly – the proportion of that data being accessed by users, has continued to

grow. We have worked to refine our understanding of the needs and interests of our stakeholders and we have either led or contributed to processes aimed at ensuring the nation remains in a strong position to understand, manage and maximise the value of its tropical marine estate.

Our technical capability, particularly the remarkable SeaSim, and our long-term, large scale capacity for monitoring and understanding complex environmental systems, has continued to support new insights into the current state and future direction of our tropical systems. Our ongoing association with some of Australia's industry-leading marine resource development companies demonstrates a shared commitment to the sustainable use of the nation's tropical marine resources. Additionally, our increasing portfolio of internationally-linked projects confirms Australia's position as a world-leader in this area of focus.

This annual report provides an analysis of the achievements of AIMS against the commitments it made at the beginning of the reporting period. The year's highlights are described in the following pages and make for compelling reading. However, it is only part of the story. The real story of AIMS, we believe, can be seen in the capability, commitment and achievements of the individuals and teams that, on a daily basis, deliver the results needed to support increased use, effective environmental management and protection of Australia's unique tropical marine ecosystems.



The Honourable Penelope Wensley AC Chairman of AIMS Council and John Gunn CEO. Image: J. de Rooy



The National Sea Simulator is providing new perspectives on marine systems. Image: Christian Miller

Highlights

Developing a coordinated and integrated monitoring and reporting program for the Great Barrier Reef

AIMS used its 30 years of monitoring expertise to help develop an integrated monitoring and reporting program for the GBR

The Australian and Queensland governments developed the *Reef 2050 Long-Term Sustainability Plan* (*Reef 2050 Plan*) in response to the United Nations Educational, Scientific and Cultural Organization's call for a coordinated and comprehensive long-term plan for the Great Barrier Reef (GBR). The *Reef 2050 Plan* provides an overarching strategy for the management of the GBR; coordinating actions to protect the values, health and resilience of the Reef, guiding adaptive management and allowing ecologically sustainable development and use.

Monitoring and reporting are key parts of the *Reef 2050 Plan*, and the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP) has been developed to provide a coordinated and integrated monitoring, modelling and reporting framework for the Reef and its catchments. RIMReP is explicitly linked to the outcomes of the *Reef 2050 Plan* and must:

- describe the status of the GBR
- contribute information to satisfy statutory reporting requirements (e.g. the *Great Barrier Reef Outlook Report*) and other reporting mechanisms
- measure the effectiveness of actions to achieve the targets, objectives and outcomes of the *Reef 2050 Plan*, across ecological, social and economic dimensions, in order to guide adaptive management.

AIMS has a long history of monitoring on the GBR. More than three decades ago, AIMS established its Long-Term Monitoring Program for the mid-shelf and outer reefs. This program measures the condition of fish and coral communities and other variables, such as the prevalence of crown-of-thorns starfish and coral disease. Since 2005, AIMS has also monitored inshore reefs in order to understand the link between their condition and coastal water quality, which is influenced by terrestrial run-off.

These monitoring programs are the only source of comprehensive long-term data on fish and benthic communities at whole-of-GBR scale. They have contributed critical information and the situational awareness of Reef condition required to evaluate management interventions (such as zoning the GBR).



AIMS is contributing its extensive experience in monitoring tropical marine systems to RIMReP through:

- strong leadership and representation on the RIMReP Steering Committee
- co-chairmanship of the RIMReP Program Design Working Group
- representation on both the RIMReP Reporting and Synthesis and Data Management and Integration working groups
- leadership of expert groups focused on monitoring coral reef habitats and the marine physico-chemical environment.



The areas between reefs play an important role in reef ecology. Image: LTMP (AIMS)

Documenting the 2016 coral bleaching event

AIMS contributed to a national taskforce assessing the impact of an extensive bleaching event that seriously damaged the northern GBR

The summer of 2015–16 experienced one of the strongest recorded El Niño events, which caused the warmest year on record for Australia and extensive coral bleaching. At the peak of the summer warming, AIMS weather stations showed that ocean temperatures exceeded historical normal summer values by 1.5–2.6 °C for the GBR, with the greatest warming seen at Thursday Island in the Torres Strait.

As a key member of the Australian National Bleaching Taskforce, along with the Great Barrier Reef Marine Park Authority (GBRMPA) and the Australian Research Council (ARC) Centre of Excellence for Coral Reef Studies (Coral CoE) at James Cook University, AIMS' research teams spent 51 ship-days surveying the extent and severity of coral bleaching on the GBR and the north-west Australian continental shelf. This coordinated effort of institutions and research agencies produced the most comprehensive assessment of a major environmental stress event to date. The national taskforce conducted underwater surveys of 144 reefs to validate the aerial survey scores of 1081 reefs along the entire length of the GBR, from the Torres Strait to its southern limit.

The results showed that bleaching severity was greatest in the north of the GBR, particularly between Port Douglas and the Torres Strait where mortality and severe bleaching affected entire reef communities to depths greater than 20 m. Surveys in June 2016 found signs of recovery in reefs south of Cairns, while reefs north of Cairns showed high mortality with long-lived massive corals, some 100–200 years old, still completely bleached. The full extent of mortality or recovery from the most severe coral bleaching event ever documented for the GBR will be assessed by the AIMS long-term monitoring and bleaching response teams in August and September 2016.

At Western Australian reefs, bleaching commenced in late March 2016 and continued through April. Impacts were as expected, based on the US National Oceanic and Atmospheric Administration's temperature predictions and the history of severe bleaching during extreme El Niño conditions in 1998. Only the northern reefs were affected, mainly the offshore and inshore reefs of the Kimberley region. Reefs in the Pilbara, Ningaloo and further south were not affected. The frequency of bleaching on Western Australian reefs has increased in recent years. The most severe and widespread bleaching of the southern reefs, including those at Ningaloo and the Abrolhos Islands, occurred in 2011 during 'marine heatwave' and La Niña conditions.

The long-term impact will become clearer by late 2016 or early 2017.



The 2016 coral bleaching event caused major damage to northern parts of the GBR. Image: AIMS

Establishing effective environmental baselines in north-west Australia

Providing the information that the oil and gas industries need to operate while minimising their environmental impact

AIMS assesses the marine environment of north-west Australia in a strategic and structured approach, through both its own surveys and collaborations with government, industry and community partners. This regional assessment framework increases our knowledge of marine communities in the north-west region and provides new baseline environmental data on reef, shoal and shelf habitats.

Surveys undertaken in collaboration with external partners include:

- Ningaloo and Shark Bay Baseline Study, with Woodside Energy Ltd (WEL)
- Barossa Shoals Survey, with ConocoPhillips
- Kimberley Marine Reserves, with the Western Australian Marine Science Institution (WAMSI).

The oil and gas industry continued to fund long-term monitoring of reefs and shoals, including Montara Shoals (funded by PTTEP, Shell, INPEX) and Scott Reef and Rowley Shoals (funded by WEL). Other monitoring was undertaken in collaboration with government. For example, the Western Australian Department of Parks and Wildlife (DPAW) supported the Ningaloo survey.

Field surveys conducted by AIMS across the banks and shoals of the Timor Sea, and on deep water reefs adjacent to the Ningaloo coast—along with surveys undertaken as part of the WAMSI Kimberley project—have contributed significant information on biodiversity in Australia's north-west. Data on species distribution and abundance have been collected in collaboration with the Western Australian Museum, Museum Victoria and CSIRO.

Collation and synthesis of information on the environment of the North West Shelf is a critical part of AIMS' work on the regional assessment framework. AIMS and its partners also ensure that industry, regulators and the general public have easy access to information through the North West Atlas, part-funded by PTTEP, and through the National Environmental Science Programme (NESP) Marine Biodiversity Hub.



AIMS is working with industry to ensure that marine systems are well understood. Image: WEL.

Predicting where coral grows with better models

Improving the quality and reducing the cost of environmental monitoring

In carrying out seabed biodiversity surveys in Western Australia, AIMS scientists have progressively developed a suite of standard survey methods. These include:

- mapping the depths and shape of the seabed using acoustics
- assessing the nature of benthic habitats with towed cameras
- recording the composition of the fish communities using baited video.

These sampling methods have been used in multiple projects across north-west Australia, including biodiversity surveys for: industry stakeholders, such as ConocoPhillips and WEL; the Australian Government Department of Environment, through projects funded under the National Environmental Research Program and NESP initiatives; and the Western Australian Government, via projects funded through WAMSI.



AIMS' extensive field surveys and data holdings are being used to predict the presence of reef communities in remote marine environments. Image: A. Heyward (AIMS)

The survey data provide descriptions of habitats and key attributes, such as coral abundance or fish diversity. In addition, they contribute to predictive spatial models that are used to report on seabed biodiversity. These models help scientists understand habitat distributions within each study area. The field data can also be interpolated and extrapolated to make predictions about ecological communities occurring in areas that have not been sampled directly. For example, a model can calculate the probability of a particular biological community being present in a particular area.

The output is a series of maps that illustrate the probability of a particular habitat being present across the study area; showing, for example, where algae, rubble, bare sand or coral are most likely to occur. These outputs are very similar to actual habitat maps, although while they predict whether a habitat is likely to be present, they provide no information on abundance.

AIMS has now developed a large dataset for submerged shoals in north-west Australia, which permits robust testing of predictive spatial models. Key attributes of interest for submerged shoals are the presence and abundance of reef-building corals. Spatial models, developed originally for individual shoals as part of discrete projects, are now being refined to integrate data at a bioregional scale. This integration has recently produced a regional spatial model that predicts coral habitats across the Oceanic Shoals bioregion. Essentially, this work identifies hitherto unknown, coral-dominated habitats on submerged shoals across the Sahul Shelf. The consistency of AIMS' sampling methods and data management has aided this initiative greatly.

Advances in modelling, and the resulting ability to predict habitat distributions from surrogate data, will lead to more efficient mapping of seabed biodiversity and reduce reliance on direct field sampling of biota. For example, AIMS was recently able to use existing industry acoustic data to develop a predictive habitat model for Rankin Bank. Industry has shown strong interest in this approach.

Providing insights into bleaching risks through data network partnerships

Using autonomous gliders to develop improved bleaching forecasting

Widespread coral bleaching was reported from the northern to the central GBR during and following the summer of 2015–16. Coral bleaching is mainly caused by persistently high sea temperatures. While bleaching occurred over a large area, the severity of impact varied from place to place. This variation raises questions about what processes control water temperatures at regional and Reef scales.

Traditionally, broad-scale ocean thermal conditions are mapped from satellite-derived sea surface temperature data. On the GBR, remotely sensed sea surface temperatures have been augmented by a sparse array of in situ sub-surface temperature loggers, which measure temperature below the surface where satellites cannot see.

For the summer of 2015–16, AIMS, in partnership with the Integrated Marine Observing System and the Great Barrier Reef Foundation, maintained a comprehensive environmental monitoring network that was unprecedented in its spatial and temporal coverage. The network comprised ocean moorings, reef-top weather stations and sensor networks, shallow reef-based temperature loggers and autonomous ocean gliders.

Particularly noteworthy is the unique dataset collected by autonomous gliders deployed throughout the central and northern GBR. Gliders move through the water by subtly, but systematically, altering their buoyancy so they follow a see-saw motion as they glide forward. They are piloted remotely and can stay at sea for several weeks, collecting

observations in places unsuitable or uneconomical for other platforms (such as ships) to visit. Over the recent summer, glider missions along and across the reef collected data describing the formation, persistence and waning of the thermal stress the reefs were subjected to. Together with other broad-scale observations, this dataset provided unparalleled definition of the three-dimensional water temperatures, and their evolution through space and time during the coral bleaching event.

AIMS oceanographers are investigating the spatial patterns and sub-surface characteristics of the warming ocean, using the glider data and results from numerical models (such as eReefs), to understand oceanographic processes that may reduce local thermal stress. For example, while the Torres Strait experienced severe bleaching across large areas, bleaching was low in some regions where tidal currents, upwelling of cool water and ocean turbulence all contributed to reducing local thermal stress. Our work, informed by the observations from the 2015–16 bleaching event, will generate a more complete understanding of the spatial variability in bleaching risk across the GBR, and will lead to improvements in satellite-derived bleaching forecasts.



Researcher preparing a Slocum glider for deployment on the GBR. Image: CSIRO

Studying evolution in a simulated 21st century reef

Evolution 21 will tell us how resilient the GBR is to climate change

The health of coral reefs has declined worldwide due to a range of local and global stressors, including terrestrial run-off, overfishing, climate warming, ocean acidification, increased cyclone activity and outbreaks of pests and diseases. Unless coral reef organisms are able to adapt or acclimatise, further declines are expected in the coming decades as global pressures such as warming and ocean acidification increase and local pressures remain. While there is some evidence of adaptation, the extent and rate at which corals and other key reef invertebrates are acclimatising and adapting are poorly understood. Scientists fear that the current rate of environmental change exceeds the rate at which key organisms can acclimatise and/or adapt. Understanding the capacity of important coral reef organisms to evolve and adapt under future climate scenarios is critical, so AIMS initiated the 'Evolution 21' project in 2016.

During the next five years, this ambitious, multi-generational experiment will investigate genetic (adaptation) and non-genetic (acclimatisation) mechanisms that contribute to the evolution of corals, sponges, echinoderms, molluscs, seagrasses and other organisms under several future scenarios of temperature and ocean acidification, which is driven by carbon dioxide. Of particular interest is the role of microbial symbionts in the adaptation and acclimatisation of reef species, and their potential to influence the rate of evolution.

Evolution 21 builds on AIMS scientists' decades of research experience in evolution, adaptation and stress tolerance, and is only possible because of the unique capabilities provided by the AIMS National Sea Simulator (SeaSim). This sophisticated aquarium system lets scientists carry out experiments simultaneously testing a number of environmental factors on a range of reef organisms over multiple generations, closely simulating natural reef conditions and inter-species interactions. Results from the Evolution 21 project will be used to build and refine predictive models of future reef resilience.



The ability to simulate future seawater conditions is key to understanding the impact of change on reef communities. Image: Christian Miller

Researching crown-of-thorns starfish for the key to population control

From genetics to chemical signals that could be used to disperse or herd starfish

The AIMS Long-Term Monitoring Program is the only broad-scale observational program documenting the extent and spread of crown-of-thorns starfish outbreaks across the GBR. Its data comes primarily from estimates of the abundance of adult crown-of-thorns starfish from diver-based surveys. Knowledge generated from this multi-decadal monitoring has informed models of crown-of-thorns starfish population densities and outbreak dynamics, yet we do not yet fully understand what conditions precede a crown-of-thorns starfish outbreak. Improved methods for detecting crown-of-thorns starfish at earlier life history stages, and over broader areas, would vastly improve outbreak detection and help scientists determine the causes of episodic population explosions.

Using genetic techniques, AIMS scientists developed a new method to measure the abundance of crown-of-thorns starfish larvae, and applied it over the reef during the crown-of-thorns starfish spawning season. The new method is logistically simpler than diver-based surveys and has been adopted by tourism operators who routinely collect samples for analysis at AIMS, enabling improved monitoring of crown-of-thorns starfish populations.

For more than half a century, the primary approach for crown-of-thorns starfish control has been physical removal or culling by divers. With starfish numbering in the millions in outbreaks, this approach to pest management has limitations. Alternative pest control technologies that can be effectively and efficiently scaled up, similar to those used for the control of agricultural pests, are highly desirable, and may be possible given a thorough understanding of crown-of-thorns starfish biology.

Working with a team of international collaborators, AIMS scientists successfully sequenced the complete 'omics' profile of the crown-of-thorns starfish: its genome (DNA), transcriptome (messenger RNA) and proteome (proteins). Genome scientists can now begin to identify critical vulnerabilities that could be targeted by control technologies. For example, the genome mapping has already helped identify olfactory (scent) cues and responses that could potentially play a role in controlling crown-of-thorns starfish. The starfish react strongly to chemical signals from both their predators and clusters of aggregating crown-of-thorns starfish; it may be possible to harness these behavioural responses to control starfish populations.



Improved understanding of crown-of-thorns starfish biology is pointing the way to future control options. Image: AIMS

Researching the impacts of dredging using AIMS' National Sea Simulator

Defining the science need to assess the impacts of port development

Ports along the Australian coast typically require dredging to maintain navigable channels and berthing areas or when port infrastructure is expanded or new ports developed. The expansion of a number of major export hubs in Western Australia, the Northern Territory and Queensland during the last decade has seen projects requiring large volumes of dredging in tropical coastal ecosystems. However, we have limited information about the impacts of dredging in often sensitive coastal ecosystems on which to base predictions and make management decisions.

AIMS is a leading partner in the WAMSI Dredging Science Node, and our researchers and collaborators have systematically examined the impacts and thresholds of dredging-related pressures on coral, filter feeders, finfish and other organisms, and on critical ecological processes. We have published detailed studies that describe, for the first time, the changes in water quality over time and space during large-scale capital dredging projects. These include analyses of how dredging increases the concentration of suspended sediments in the water, and how the subsequent water cloudiness (turbidity) reduces the quantity and quality of underwater light for photosynthetic organisms, such as seagrasses and the algae that live inside corals. The studies describe how water quality improves with increasing distance from the site of dredging.

These analyses, which were made possible by the donation of data from the dredging proponents (companies such as WEL, Chevron and BHP), also describe the intensity, duration and frequency of natural turbidity events (from storms and cyclones), and how these change during dredging. The resulting data are invaluable for understanding and reproducing realistic exposure scenarios in SeaSim to more fully investigate the risks associated with dredging.

Three major reviews have examined the effects of sediments from dredging on adult corals, the reproductive cycle and early life history stages of corals, and on filter feeders, particularly sponges. These reviews have identified the likely cause–effect pathways whereby sediments released into the water column by dredging (and dredging-related activities such as dredge material placement) can affect the physiology of adult and juveniles forms. The reviews also evaluated the applicability of past studies on the effects of sediments in the light of contemporary understanding of changes in water quality associated with dredging.

Experiments in SeaSim examined the effects of a variety of factors, such as increased concentrations of suspended sediments, decreases in light and increased sedimentation, either alone or in combination. Study organisms, including adult corals, sponges and early life history phases of corals (such as eggs and free-swimming larvae), were tested under the various conditions to discover potential cause–effect pathways and establish dose–response relationships. This information will aid the real-time management of the impacts of dredging activities.



AIMS researchers are working with industry to better understand the impact of dredging operations. Image: J. Gioffre (AIMS)

Developing tropical marine ecotoxicology tests for Australian ecosystems

How do oils, pesticides, metals and other pollutants affect tropical marine animals?

AIMS has been developing and applying ecotoxicological methods for Australian tropical marine ecosystems to examine the impacts and risks of contamination. Specifically, AIMS researchers have been addressing the lack of toxicity tests relevant to Australia's tropical marine species and environments. Our researchers have developed ecotoxicological tests for a diverse range of important tropical species found in Australian ecosystems.

The ecotoxicological research has focused on high-priority contaminants from existing and proposed industrial and land-based developments in tropical northern Australia. Newly developed protocols have been applied to assess the toxicity of metals (such as aluminium, gallium and molybdenum) and oil and gas contaminants (such as condensates and dispersants) in order to generate species sensitivity distributions.

For example, over the last year we have:

- developed and published acute and chronic tests of metals for the tropical marine species *Amphibalanus amphitrite* (barnacle), *Nassarius dorsatus* (dog whelk) and *Coenobita variabilis* (hermit crab)
- developed and published tests for the effect of oils on sponges and larval corals
- tested the effects of a dispersant on seven tropical marine species to produce a species sensitivity distribution
- developed methods to quantify dispersants
- developed spill models for blowout scenarios .

These species sensitivity distributions form the statistical basis for developing regulatory water quality guidelines, such as the 2016 revision of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

This achievement means that AIMS is now the only research organisation in Australia with the capability to assess acute and chronic biological effects of contaminants on tropical marine species. This focus on capacity-building has opened up opportunities to work with industry and government agencies to deliver improved risk assessments for tropical marine ecosystems.



Corals exposed to increasing dispersant concentrations. Image: F. Flores (AIMS)

Surveying the world's sharks, rays and skates in the Global FinPrint project

Where do reef sharks live and feed and are their populations recovering?

AIMS is a key collaborator in the Global FinPrint project funded by Vulcan Inc., which is part of Microsoft founder Paul G. Allen's philanthropic portfolio. The Global FinPrint project brings together investigators from around the world to conduct the first global survey of reef shark abundance. Surveys are conducted using baited underwater video systems, which were pioneered in part by AIMS. The project aims to compare reefs with different characteristics to see what factors (such as coral cover, fish population density, fishing pressure or water temperature) determine the number, types and sizes of sharks present. AIMS scientists comprise half of the US\$4 million project science team and are leading sampling in the Pacific and Indian oceans as well as heading global data synthesis and analysis.

AIMS teams have sampled four locations along the GBR and two locations in each of Palau, American Samoa, Ashmore Reef (Western Australia) and the Maldives. To date, AIMS teams have deployed over 1000 baited underwater video systems in the FinPrint project.

Sampling is already revealing large differences in the number and abundance of reef sharks across sites. The far northern GBR showed high abundance and diversity compared with other GBR sites and international locations, such as American Samoa and the Caribbean. Surveys at Ashmore Reef revealed an increase in reef shark abundance since the previous surveys conducted in 2004, which may indicate population recovery after overfishing by foreign fleets.

The Global FinPrint project will provide data on the presence of reef sharks and patterns of abundance that will help determine the effects of habitat characteristics or fishing patterns. This information will inform conservation and management efforts to protect specific regions as required. Preliminary results provide an indication of the global scale analyses and outputs this project will produce. Additional information can be found at <https://globalfinprint.org/>.



Sharks play an important role in reef communities. Image: LTMP (AIMS)

Tracking marine megafauna in Western Australia

Revealing the hotspots for tiger shark and turtle feeding

AIMS continues to improve our understanding of the movement and distribution of marine megafauna (marine mammals, sea turtles and sharks), collecting new observations and synthesising existing data. The work examines how animal movements and distribution relate to both natural and anthropogenic variables and focuses on biologically important areas that are subject to threatening processes.

Current projects include work on humpback whales (*Megaptera novaeangliae*), whale sharks (*Rhincodon typus*) and tiger sharks (*Galeocerdo cuvier*), and the assessment of important foraging hotspots for flatback sea turtles (*Natator depressus*). This work is being done for commercial (Quadrant Energy and WEL) as well as state government (DPaW and WAMSI) and federal government (Department of the Environment) clients.

Recent work includes a global analysis of patterns in movement and feeding of tiger sharks and the analysis of turtle tracks collected by consultants and industry to identify hotspots for feeding. This information will help to direct benthic sampling in other WAMSI projects led by AIMS.

AIMS is also engaged in a collaborative initiative involving the Massachusetts Institute of Technology, the University of California, Swansea University and King Abdullah University of Science and Technology to develop and trial new tags for marine megafauna.



AIMS is creating new knowledge about the relationship between marine animal distribution and the changing environment. Image: Wayne Osborn

Providing effective decision-support tools

Eighty marine monitoring programs operate across the GBR. Which ones can contribute to integrated monitoring?

The AIMS Decision Science Team delivered a major report to the NESP Tropical Water Quality Hub. The report analysed current marine environmental monitoring in the GBR to inform development of an integrated monitoring and reporting program for the *Reef 2050 Plan*. Monitoring is critical to evaluating how well the targets, objectives and outcomes of the *Reef 2050 Plan* are met.

The report found that the GBR World Heritage Area is a busy space for environmental monitoring, with 80 marine environmental monitoring programs under way (see Figure 2). However, only a few had demonstrated they can detect and measure changes in key attributes, such as important habitats (for example, coral reefs and seagrasses), species of conservation concern (for example, megafauna) and critical environmental drivers (particularly water quality). The Decision Science Team recommended building on these programs to create a broader integrated monitoring program.

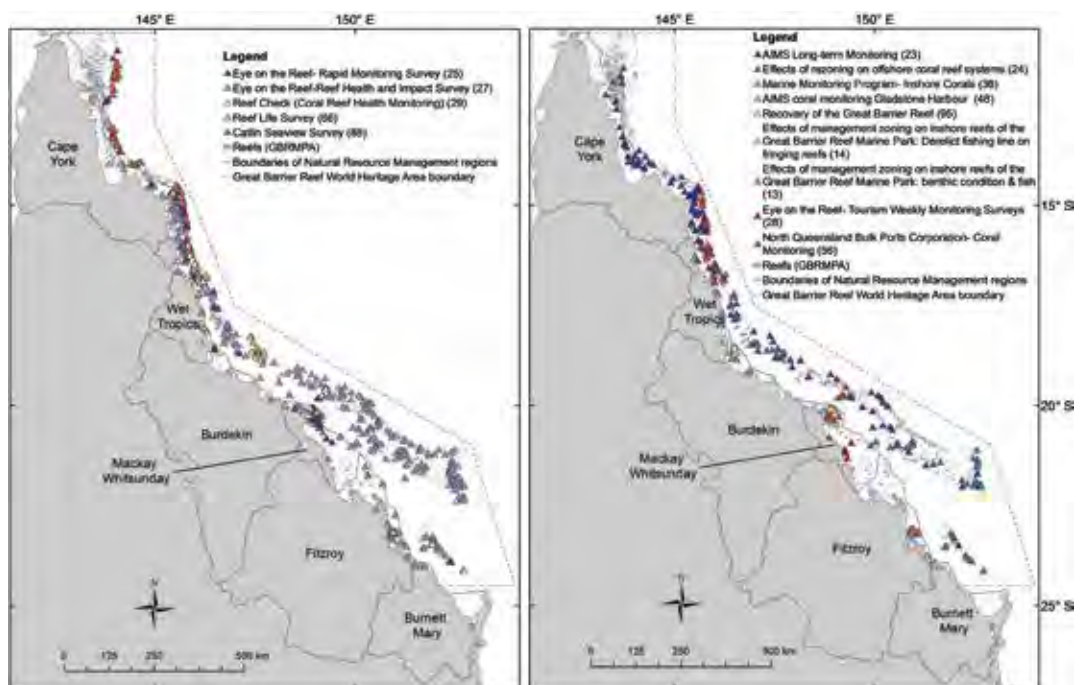


Figure 2: Location of sites associated with some of the 80 marine environmental monitoring programs currently under way on the GBR

Other programs were found to be of limited use to an integrated program because they either: had been established for independent purposes (such as university research, education, awareness-raising or stewardship); operated at small geographic or temporal scales; were not government funded; gave limited access to data; or were conducted to ensure compliance with development conditions.

The report also assessed the power of some of the programs to detect declines (or improvements) in attributes considered important for the *Reef 2050 Plan*, a key criterion when designing an integrated monitoring and reporting program. Given that the cost of monitoring the full breadth of targets and objectives in the *Reef 2050 Plan* with sufficient power to identify success and failure is likely to be prohibitive, stakeholders will need to choose which attributes should be monitored and how. The Decision Science Team's report provides the tools for such decision-making.



Identifying and monitoring change is an essential part of the reef manager's toolkit. Image: LTMP (AIMS)

Reporting on the health of Gladstone Harbour

A pass grade for the harbour

The Gladstone Healthy Harbour Partnership (GHHP) used AIMS' data and analysis skills to produce a 'report card'—a snapshot of the environmental health of Gladstone Harbour and its surrounding waterways for 2015–16. The harbour received a clean bill of health, with an overall grade of C (satisfactory); individual zones within the harbour received scores ranging from A (very good) to C.

GHHP was advised by its Independent Science Panel, which includes Drs Britta Schaffelke and Richard Brinkman from AIMS, to select and monitor a range of indicators that would give a meaningful picture of the harbour's environmental health. The indicators include water and sediment quality, connectivity, habitats and selected biodiversity measures, all of which are measured by regular sampling of the harbour and its waterways.

AIMS statistician Dr Murray Logan, along with Dr Eric Lawrey, Gael Lafond and Greg Coleman (AIMS' Knowledge Systems for Environmental Research Team), transformed the environmental data on hundreds of parameters, which had been collected by many of the partner organisations within the GHHP, to produce the report card.

AIMS is one of the key research providers for the GHHP initiative, which aims to produce a transparent, authoritative and meaningful report that can be understood by the many different stakeholder groups within Gladstone Harbour.

More information can be found at the GHHP report cards website at <http://rc.ghhp.org.au/report-cards>.



Effective environmental management of Gladstone Harbour requires the collection, assessment and presentation of a wide range of data. Image: GHHP

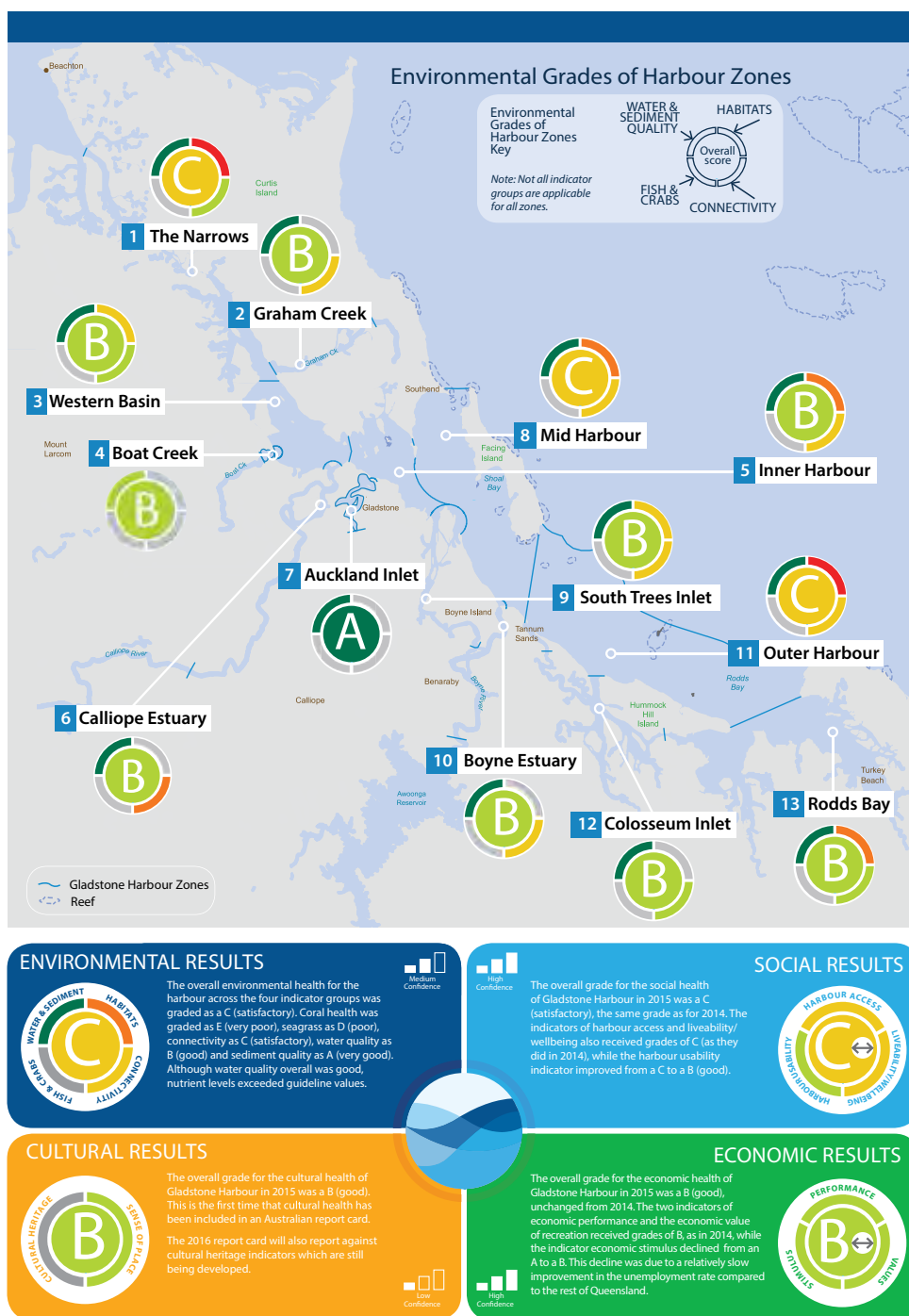


Figure 3: The Gladstone Harbour Report Card shows healthy results for the 13 zones included in the overall scorecard.

Graphic: GHHP

The first openly available complete mapping of the whole GBR

AIMS established the eAtlas to preserve and present environmental research data and knowledge online to help researchers and managers better understand the marine environment. The eAtlas specialises in reviewing and packaging datasets generated by research projects so they are well documented, discoverable and accessible to everyone. Spatial datasets are visualised in an online mapping environment, allowing them to be used directly for planning purposes without the need for specialist GIS software. The eAtlas now contains data from over 15 institutions, 200 datasets and 3400 mapping layers.

This map illustrates the Pacific Ocean region, specifically the area around the Hawaiian Islands and the Line Islands. The Hawaiian Islands are shown in the upper left, with labels for Midway Island, Laysan Island, and the Line Islands. The Line Islands are shown in the lower right, with labels for Johnston Atoll, the Line Islands, and the Line Islands. The map is oriented with North at the top.

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Coral colony developing on a settlement plate in SeaSim. Image: Christian Miller

Performance statement



Australian Government

AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE

| DARWIN

| PERTH

Statement of preparation

I, as the accountable authority of the Australian Institute of Marine Science, present the 2015–16 annual performance statements of the Australian Institute of Marine Science, as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and other applicable legislation. In my opinion, these annual performance statements are based on properly maintained records, accurately reflect the performance of the entity, and comply with subsection 39(2) of the PGPA Act.

Council endorsed the content of the performance statements by a resolution on 20 September 2016.

The Honourable Penelope Wensley AC
Chairman
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Entity purpose

AIMS was established by the Australian Government in 1972 to carry out research and development relating to, and to promote the application and use of, marine science and marine technology. The functions and powers of the Institute are fully described in Appendix 3. Legislative foundation and ministerial powers on page 155. AIMS' mission statement (see box below) provides a contemporary overview of the Institute's research focus.

AIMS' mission:

To provide the research and knowledge of Australia's tropical marine estate required to support growth in its use, effective environmental management and protection of its unique ecosystems.

Intended outcomes

The Institute's annual *Portfolio Budget Statement* (PBS) provides the Commonwealth Parliament with information on how AIMS will use its allocated resources to achieve government outcomes over the current budget and forward years.

The 2015–16 PBS describes AIMS as contributing to Outcome 1: Growth of knowledge to support protection and sustainable development of Australia's marine resources through innovative marine science and technology. AIMS' activities contribute to the achievement of Outcome 1 through Program 1.1: Marine Research.

Through engagement with stakeholders across government and industry, AIMS has developed a comprehensive research program that continues to produce excellent science, while ensuring that its multidisciplinary science capability, infrastructure and research investment remain focused on, and address, national needs and aspirations.

AIMS' 2015–16 PBS and *Corporate Plan 2015–19* identify three specific focus areas:

1. A healthy and resilient Great Barrier Reef (GBR)
2. Sustainable coastal ecosystems and industries across northern Australia
3. Environmentally sustainable offshore oil and gas development.

During 2015–16, AIMS established a series of five-year research goals addressing key issues associated with these focus areas. The goals, targeted for delivery by 2020, are mapped against the Australian Government's National Science and Research Priorities, and stakeholder needs, in Table 1.

AIMS' *Corporate Plan 2015–19* identified the specific objectives, and associated performance measures, intended to deliver on year one of this five-year plan. An overview of organisational performance against those measures is provided in Table 2 (page 33). Table 3 (page 37) provides a summary of performance against the specific research and development activities planned for 2015–16.

Table 1: Alignment with the Australian Government's National Science and Research Priorities and stakeholder needs

AIMS' 2020 Research Goals	Alignment with National Science and Research Priorities			Alignment with stakeholder needs		
	Soil and water	Energy	Environmental change	Government	Industry	Not-for-profit
Develop and test predictive models of reef resilience related to global and local pressures on reef systems in north-west Australia and the GBR	***		***	***	***	***
Play a key role in the development and implementation of a fully integrated monitoring program and adaptive management framework for the Great Barrier Reef World Heritage Area (GBRWHA)	***		**	***	*	*
Develop a risk assessment and decision-support system for the Great Barrier Reef Marine Park Authority (GBRMPA) to identify the most effective options for management interventions	***		*	***	***	*
Develop ecosystem function-based approaches to identify and document the impacts of human activity on the health and resilience of coastal systems	***	*	*	***	***	*
Develop risk assessments and models of the impacts of coastal development, including ports, based on empirical data	***	*		***	***	*
Establish and commence implementation of a coordinated regional assessment framework for the reefs and shoals of north-west Australia	***	**	**	***	***	*

Table legend: Asterisks indicate degree of alignment (more asterisks = greater alignment)

Results and commentary on performance

AIMS achieved all high-priority research outcomes detailed in the *AIMS Corporate Plan 2015–19*. This was an excellent outcome particularly given the global commodity price downturn and associated impact on revenue earnings.

At the commencement of each annual reporting cycle, only a proportion of external revenue (40–60 per cent) is contracted. This creates two risks that AIMS manages within the cycle:

- Annual external revenue earnings, and hence the capability AIMS can retain and the associated research outputs it should target, is subject to forecasting error. Note that the market sectors in which AIMS operates are typified by short-term bespoke research projects; there are no routine or regulated external revenue sources.
- Customers' contract AIMS to undertake specific research projects (that is, the research scope is contractually linked to the funding). While AIMS undertakes extensive stakeholder consultations when setting plans, it is still not feasible to predict exactly what areas of research will be externally funded.

In response, AIMS operates an adaptive research planning process that continually reviews and adjusts research programs so that the highest priority research is completed. It achieves this by adjusting the research it funds with its government funding appropriation to 'fill around' that funded externally.

In 2015–16 external revenue was lower than budgeted due to factors including market downturns (across several industry sectors), delays and increased competition in government funding programs, and pressure to increase the percentage AIMS is funding within co-investment projects. These pressures are expected to continue into 2016–17.

The following two tables provide an assessment of outcomes against the specific objectives detailed in the *AIMS Corporate Plan 2015–19*.

Table 2: Overall performance summary

Aspect and objective	Performance criterion	Achievement and commentary	Achievement references
<p>Research planning</p> <p><i>To establish research goals and objectives that meet high-priority stakeholder needs.</i></p>	<p>Assessment of AIMS research activities that directly align and contribute to national science and research priorities</p> <p>Mapping of research against stakeholder needs</p> <p>Assessment of research milestone completion against planned targets</p> <p>Development of an international engagement strategy</p>	<p>The Institute's strategic research objectives and goals are defined in the <i>AIMS Strategic Plan 2015–25</i>. The five-year research goals identified in the plan cascade down into annual plans. These goals and plans are both aligned to national science and research priorities and the needs of AIMS' key stakeholders.</p> <p>AIMS has developed and begun to implement a new international engagement strategy to guide development of R&D partnerships with key international institutions and government agencies. The objectives are to enhance Australia's support for regional blue economies and to build AIMS' capability and profile in core areas through partnerships with current and emerging global leaders.</p>	<ul style="list-style-type: none"> • AIMS Strategic Plan 2015–25 • Refer to Table 1: Alignment with the Australian Government's National Science and Research Priorities and stakeholder needs (page 31) • Stakeholder engagement (page 62) • Science quality assurance (page 60) • Research collaboration (page 58) • Contributing to issues of international importance (page 47)

Continued over page

Aspect and objective	Performance criterion	Achievement and commentary	Achievement references
<p>Research delivery</p> <p><i>To establish and deliver high quality research outcomes designed to achieve research goals and meet stakeholder needs.</i></p>	<p>Assessment of AIMS research activities that directly align and contribute to national science and research priorities</p> <p>Mapping of research against stakeholder needs</p> <p>Assessment of research milestone completion against planned targets</p> <p>Development of an international engagement strategy</p>	<p>AIMS completed all high priority research tasks funded during 2015–16.</p> <p>A proportion of AIMS 2015–16 research was contracted (and funded) during the financial year, causing some changes to the research program established at the beginning of the financial year.</p> <p>All of the research completed was aligned to <i>AIMS Strategic Plan 2015–25</i>.</p>	<ul style="list-style-type: none"> External project milestone completion rate is identified under Science quality assurance (page 60) Table 3: Summary of AIMS' performance against 2015–16 Research Goals (page 37)
<p>Research communication and extension:</p> <p><i>To ensure that AIMS research is communicated and provided to stakeholders in a range of manners such that they derive maximum possible value from the public investment in AIMS.</i></p>	<p>Stakeholder satisfaction measured via surveys</p> <p>Number of peer-reviewed scientific publications and client reports</p> <p>Participation in panels and advisory committees</p> <p>Number of jointly supervised PhD students and post-doctoral fellows</p>	<p>AIMS communicated its research findings via a wide range of mechanisms. These included peer reviewed publications, reports, panels and advisory boards, presentations, conferences, websites, articles in news media and social media posts.</p> <p>AIMS conducted a stakeholder satisfaction survey, the results of which indicated that AIMS is a highly valued research provider well positioned to deliver their knowledge needs.</p>	<ul style="list-style-type: none"> Stakeholder survey (page 65) Publications (page 43) Appendix 1. Science publications Expert advice (page 48) Appendix 2. External committees (page 151) Fostering research capability (page 56)

Continued over page

Aspect and objective	Performance criterion	Achievement and commentary	Achievement references
<p>Research excellence</p> <p><i>To ensure that AIMS undertakes quality, independently reviewed research that stakeholders can rely on.</i></p>	<p>Global rankings based on publications in relevant scientific fields</p> <p>Stakeholder surveys</p> <p>Mapping of completed research against stakeholder needs</p>	<p>AIMS continued to deliver high quality research appropriate to the knowledge gaps being addressed. It maintained its scientific excellence as measured by its global rankings.</p> <p>AIMS completed a stakeholder survey that reflected positively on AIMS' research delivery and excellence.</p>	<ul style="list-style-type: none"> • Publications (page 43) • Stakeholder survey (page 65) • Table 8: Stakeholders benefiting from AIMS' activities in 2015–16 (page 63)
<p>Health, safety and environmental (HSE) performance</p> <p><i>To provide a workplace where HSE risks are managed to be as low as reasonably practicable.</i></p>	<p>Lost time and total injury frequency rates</p> <p>Completion of system audits</p> <p>Improvement projects completed</p>	<p>AIMS continued to provide a healthy and safe workplace and to proactively manage its health, safety and environmental risks.</p> <p>An increased focus on hazard reporting resulted in a three fold increase in reporting compared to 2014–15. No high potential or notifiable incidents occurred.</p> <p>AIMS' outstanding HSE performance is recognised by industry partners, particularly those involved in offshore oil and gas development, and is a key enabler of AIMS' ongoing ability to establish research partnerships.</p> <p>AIMS laboratory and field based research (often in remote locations) have high inherent risk, and over time AIMS has developed a comprehensive safety management system to manage these risks. During 2015–16 a core component of this system, the 'operational risk framework' was extensively reviewed and updated in combination with a program of staff training and support.</p>	<ul style="list-style-type: none"> • Health and safety (page 86) • Completion of system audits (page 88) • Incidents and hazard reporting (page 88) • Environmental performance (page 88)

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Aspect and objective	Performance criterion	Achievement and commentary	Achievement references
<p>Operational performance</p> <p><i>To provide the most cost effective and efficient research capability required to deliver our research goals.</i></p>	<p>Research vessel and National Sea Simulator (SeaSim) availability and use</p> <p>Major assets with documented asset management programs</p> <p>Number of joint ventures and strategic alliances</p> <p>Percentage of collaborative research projects</p> <p>Retention of staff and infrastructure capabilities</p> <p>Delivery of planned training and development programs</p>	<p>AIMS operates an extensive research infrastructure portfolio that complements its human resource capability. This includes research laboratories, the internationally significant SeaSim, coastal class research vessels and a large portfolio of field monitoring infrastructure.</p> <p>All infrastructure performance metrics were excellent, with benchmark levels of reliability, availability and functional performance achieved. This performance continues to be recognised by collaborative research partners, with 50 per cent of all vessel trips and 80 per cent of SeaSim experiments involving national or international collaborating partners.</p> <p>AIMS continued to extend its research capability and regional impact with institutional level collaborations, partnerships and memorandums of understanding with over 50 companies, institutions and government stakeholders.</p>	<ul style="list-style-type: none"> Research infrastructure (page 67) Marine operations (page 68) Partnerships (page 49) Research collaboration (page 58) Fostering research capability (page 56) Staff (page 90)
<p>Financial performance</p> <p><i>Financially sustainable performance where opportunities and risk are appropriately managed.</i></p>	<p>Achieving operational revenue earnings</p> <p>Delivering outputs within budgeted expenses</p> <p>Achieving capital investment plans</p>	<p>Approximately 32 per cent of AIMS' operating expenditure (excluding depreciation) was funded through external revenue sources during 2015–16. External revenue was lower than targeted, however AIMS was able to retain core capabilities and deliver on key research programs while achieving a balanced cash budget outcome.</p>	<ul style="list-style-type: none"> Revenue (page 70) Financial statements (page 95)

Table legend

All expectations met

Most expectations met

Did not meet expectations

Table 3: Summary of AIMS' performance against 2015–16 Research Goals

Deliverable identified in the Corporate Plan 2015–19	Achievement and commentary	Examples of achievement
Work with Commonwealth and state agencies, as well as other research organisations, to design and develop a fully integrated monitoring program for the GBR that incorporates AIMS' inshore and shelf reef monitoring data with the outputs from catchment and coastal sediment models to inform progress implementing the <i>Reef 2050 Long-Term Sustainability Plan</i>	AIMS is working closely with Commonwealth and Queensland Government agencies, research organisations and stakeholders to design and develop the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP), which is a major initiative of the <i>Reef 2050 Long-Term Sustainability Plan (Reef 2050 Plan)</i> . The RIMReP design process considers how well existing monitoring and modelling activities being conducted within the GBRWHA meet information requirements to assess the effectiveness of the <i>Reef 2050 Plan</i> ; meet the statutory reporting requirements of the <i>GBR Outlook Report</i> ; and inform management decisions. It will make recommendations for an integrated monitoring and modelling program that spans the biophysical and social dimensions of the GBR and its adjacent catchments.	<ul style="list-style-type: none"> • Developing a coordinated and integrated monitoring and reporting program for the Great Barrier Reef (page 9) • AIMS involvement in the implementation of the <i>Reef 2050 Long-Term Sustainability Plan</i> (page 46)
Continue to deliver AIMS' Long Term Monitoring Program and the Reef 2050 Plan Marine Monitoring Program to maintain situational awareness of the status of the GBR, and assess the effectiveness of the marine park zoning and the magnitude and impact of the current crown-of-thorns outbreak	<p>Contracts providing co-investment to deliver both the AIMS Long-Term Monitoring Program and components of the Reef 2050 Plan Marine Monitoring Program were secured. AIMS has contributed monitoring data to key stakeholders and management agencies to maintain situational awareness of the state of the GBR. In particular, an update to an earlier article (Death et al., 2012), which documented a major decline in coral cover. The more recent data showed significant recovery of coral cover in the southern GBR.</p> <p>In addition, the AIMS Long-Term Monitoring Program was a key contributor to the assessment of the impacts on the GBR caused by mass coral bleaching during the summer of 2015–16, and in documenting the spread of crown-of-thorns starfish outbreaks.</p>	<ul style="list-style-type: none"> • Documenting the 2016 coral bleaching event (page 11) • Researching crown-of-thorns starfish for the key to population control (page 17)

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Deliverable identified in the <i>Corporate Plan 2015–19</i>	Achievement and commentary	Examples of achievement
Gain industry and government support for a coordinated regional assessment framework for north-west Australian reefs and shoals to document biodiversity and provide effective environmental baselines	With support from the National Environmental Science Programme (NESP) Marine Biodiversity Hub, the Western Australian Marine Science Institution (WAMSI) and the oil and gas industry, AIMS is developing environmental baselines that underpin impact assessments, and provide a deeper understanding of the biodiversity of the north-west shelf region. The knowledge generated through these projects is being made available to government regulators, industry and the general public through the industry-funded North West Atlas.	<ul style="list-style-type: none"> Establishing effective environmental baselines in north-west Australia (page 12)
Continue to develop predictive habitat models and facilitate adaptive management of new commonwealth marine reserves using monitoring data generated by both industry and government	With support from the Australian Government, WAMSI and industry, AIMS has used a suite of techniques to map the sea floor, survey both benthic and fish communities, and measure parameters that describe the water column. AIMS has used these data to build spatial models that predict the likelihood of encountering a particular habitat in a specific location. These habitat models are validated using field data, and are continually refined to improve their predictive power. Importantly, the development of robust predictive models enables maps of the likely distribution of specific habitats to be produced, which builds understanding and reduces reliance on direct sampling over large spatial scales, reducing costs for industry.	<ul style="list-style-type: none"> Predicting where coral grows with better models (page 13)

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Deliverable identified in the Corporate Plan 2015–19	Achievement and commentary	Examples of achievement
Service and maintain marine research infrastructure (for example, moorings array and shipboard instruments, sensor networks (Integrated Marine Observing System (IMOS)/Facility for the Automated Intelligent Monitoring of Marine Systems (FAIMMS)) and AIMS weather stations) across northern Australia, continue to provide data streams in near real time to national and international partners, and incorporate these data into oceanographic and ecosystem models	AIMS, in collaboration with IMOS, maintains a comprehensive environmental monitoring network on the GBR and across northern Australia (comprising moorings, weather stations, sensor networks, temperature loggers and ocean gliders). The data collected from these networks are quality controlled and provided in near real-time to national and international partners who use them for a variety of monitoring and modelling activities. For example, the AIMS-maintained marine infrastructure provided unparalleled capability to describe the oceanic conditions that lead to unprecedented mass coral bleaching on the GBR during the 2015–16 summer.	<ul style="list-style-type: none"> • Data network partnerships provide insights into bleaching risks (page 14)
Assess potential mechanisms for assessing and controlling crown-of-thorns (COTS) outbreaks	During the past 30 years, cyclones, COTS and bleaching have caused an average decline in coral cover of around 50 per cent across the GBR. Of these pressures, COTS is the most amenable to mitigation through appropriate management action. AIMS is instrumental in documenting the extent and dispersal of COTS outbreaks. In order to improve early detection of COTS outbreaks, AIMS has developed a new method which uses genetic techniques to determine the abundance of COTS larvae over broad geographic scales during the COTS spawning season. The new method is logistically easier than diver-based surveys and has been adopted by tourism operators who routinely collect samples for analysis at AIMS, enabling improved monitoring of COTS populations. In addition, AIMS, in partnership with international collaborators, is using the complete sequence of the COTS genome to examine potential vulnerabilities that could be exploited to control COTS populations, particularly those associated with chemical attractants and repellents.	<ul style="list-style-type: none"> • Researching crown-of-thorns starfish for the key to population control (page 17)

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Deliverable identified in the Corporate Plan 2015–19	Achievement and commentary	Examples of achievement
Use the state-of-the-art capability provided by the National Sea Simulator, in combination with targeted field studies, to investigate the individual and cumulative effects of global (elevated sea temperature, ocean acidification) and local (nutrients, sediments, light, pollutants) pressures on the health, thresholds, adaptive capacity and resilience of key components and processes of tropical marine ecosystems in order to enhance our capability to predict and manage impacts	Using SeaSim, AIMS has initiated an ambitious, multi-generational experiment investigating the capacity of corals, sponges, echinoderms, molluscs, seagrasses and other organisms to adapt or acclimatise to likely future temperature and carbon dioxide–driven ocean acidification scenarios. Results from this and other projects will be used to build and refine predictive models of future reef resilience. In addition, NESP funding was secured to develop a framework for examining the cumulative impacts of both global and local pressures on key components and processes of tropical marine ecosystems.	<ul style="list-style-type: none"> Studying evolution in a simulated 21st Century reef (page 16)
Systematically examine the impacts and thresholds of dredging-related pressures on coral, filter feeders, finfish and other organisms, and on critical ecological processes	With funding from industry offsets made available through WAMSI, AIMS has conducted systematic studies examining the impacts and thresholds of dredging-related pressures on water quality and key fauna and flora. AIMS has collected data describing changes in the concentration of suspended sediments and light attributable to dredging operations associated with the creation of a new shipping channel. These data have been used to replicate exposure scenarios in experiments conducted within SeaSim to test the effects of increased suspended sediments, sedimentation and decreased light on corals, sponges and other organisms.	<ul style="list-style-type: none"> Researching the impacts of dredging using AIMS' National Sea Simulator (page 18)

Continued over page

Deliverable identified in the Corporate Plan 2015–19	Achievement and commentary	Examples of achievement
Develop and apply ecotoxicological methods for Australian tropical marine ecosystems to examine the acute and chronic effects and persistence of pollutants (for example, pesticides, metals, coal dust, oil and gas condensate, endocrine disruptors) originating from terrestrial run-off and industrial facilities on tropical coastal and marine fauna, flora and microbial communities	Australia's ability to assess the chronic and acute effects of pollutants is undermined by a lack of toxicity tests specifically for tropical marine environments and species. In order to remedy this situation, AIMS has developed a suite of ecotoxicological assays for a range of species from different animal groups and functional levels within the marine environment. These newly developed assays have been used to assess the toxicity of several pollutants of concern in the marine environment. The results will inform the 2016 revision of Australian and New Zealand guidelines for fresh and marine water quality. In addition, AIMS is working with the oil and gas industry to determine toxicity thresholds for relevant tropical marine species. The data will be combined with spill models to improve risk assessments of potential spill scenarios.	<ul style="list-style-type: none"> Developing tropical marine ecotoxicology tests for Australian ecosystems (page 20)
Investigate the status and movement patterns of key megafauna species (sharks, whales, turtles) using a variety of telemetric techniques to determine their habitat requirements and identify critical areas for conservation and management	AIMS uses a variety of techniques to determine abundance, movement and habitat use of key megafauna species. With funding from the Vulcan Foundation and in partnership with international collaborators, AIMS is conducting the first global survey of reef shark abundance. Using baited remote underwater video stations (BRUVS) pioneered by AIMS, AIMS is leading surveys in the Pacific and Indian oceans, and synthesis and analysis of the global dataset. The project will determine the effects of fishing or habitat on shark abundance and inform conservation and management efforts to protect specific regions.	<ul style="list-style-type: none"> Surveying the world's sharks, rays and skates in the Global FinPrint project (page 21) Tracking marine megafauna in Western Australia (page 22)

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Deliverable identified in the <i>Corporate Plan 2015–19</i>	Achievement and commentary	Examples of achievement
Draw on the outcomes of monitoring, field and experimental work to develop effective decision support tools to assist management agencies to evaluate potential management options to maintain the health and resilience of tropical marine ecosystems	AIMS is playing a lead role in the design and development of the RIMReP, which is a major initiative of the <i>Reef 2050 Plan</i> . With support from the NESP Tropical Water Quality Hub, AIMS decision scientists have laid a solid foundation for the development of the RIMReP by evaluating the scale and scope of existing monitoring on the GBR.	<ul style="list-style-type: none"> • Providing effective decision-support tools (page 23)
Ongoing development of information management systems, visualisation and reporting tools for Australia's tropical marine systems that directly inform industry, government and the public	With support from the Australian Government and industry, AIMS has developed the eAtlas to preserve and present environmental research data and knowledge online to help researchers and managers better understand the marine environment. The eAtlas specialises in reviewing and packaging datasets generated by research projects so they are well documented, discoverable and accessible to everyone. Spatial datasets are visualised in an online mapping environment that allows them to be used directly for planning purposes without the need for specialist GIS software. The eAtlas now contains data from over 15 organisations, 200 datasets and 3400 mapping layers. In addition, the open source platform of the eAtlas has been expanded to Australia's north-west and Torres Strait. It also underpins Gladstone Healthy Harbour Partnership's Data and Information Management System.	<ul style="list-style-type: none"> • Reporting on the health of Gladstone Harbour (page 25) • Sharing marine data through eAtlas (page 27)

Table legend

All expectations met

Most expectations met

Did not meet expectations

Publications

AIMS has a strong publication record within its fields of expertise, namely, climate change and ocean acidification, biodiversity, ecosystem processes, ecosystem status and trends, water quality and marine microbiology. These fields align closely with the needs of our major stakeholders and end users.

AIMS scientists produced 249 publications during calendar year 2015.⁵ The publications comprised 186 journal articles, 5 book chapters, 29 reports, and 23 Doctor of Philosophy (PhD) and 6 Master of Science (MSc) theses (see Appendix 1. Science publications).

High-profile articles published by AIMS scientists in some of the world's most prestigious multidisciplinary journals included:

- 1 MacNeil MA, Graham NAJ, Cinner JE, Wilson SK, Williams ID, Maina J, Newman S, Friedlander AM, Jupiter S, Polunin NVC, McClanahan TR (2015) Recovery potential of the world's coral reef fishes. *Nature* 520: 341–344
- 2 Graham NAJ, Jennings S, MacNeil MA, Mouillot D, Wilson SK (2015) Predicting climate-driven regime shifts versus rebound potential in coral reefs. *Nature* 518: 94–97
- 3 Dixon GB, Davies SW, Aglyamova GA, Meyer E, Bay LK, Matz MV (2015) Genomic determinants of coral heat tolerance across latitudes. *Science* 348(6242): 1460–1462
- 4 Fantazzini P, Mengoli S, Pasquini L, Bortolotti V, Brizi L, Mariani M, Di Giosia M, Fermani S, Capaccioni B, Caroselli E, Prada F, Zaccanti F, Levy L, Dubinsky Z, Kaandorp JA, Konglerd P, Hammel JU, Dauphin Y, Cuif JP, Weaver JC, Fabricius KE, Wagermaier W, Fratzl P, Falini G, Goffredo S (2015) Gains and losses of coral skeletal porosity changes with ocean acidification acclimation. *Nature Communications* 6: 7785
- 5 Emslie MJ, Logan M, Williamson DH, Ayling T, MacNeil MA, Ceccarelli D, Cheal AJ, Evans RD, Johns KA, Jonker MJ, Miller IR, Osborne K, Russ GR, Sweatman HPA (2015) Expectations and outcomes of reserve network performance following re-zoning of the Great Barrier Reef Marine Park. *Current Biology* 25(8): 983–992
- 6 Anthony KRN, Marshall PA, Abdulla A, Beeden R, Bergh C, Black R, Eakin CM, Game ET, Gooch M, Graham NAJ, Green A, Heron SF, van Hooidonk R, Knowland C, Mangubhai S, Marshall N, Maynard JA, McGinnity P, McLeod E, Mumby PJ, Nyström M, Obura D, Oliver J, Possingham HP, Pressey RL, Rowlands GP, Tamelander J, Wachenfeld D, Wear S (2015) Operationalizing resilience for adaptive coral reef management under global environmental change. *Global Change Biology* 21(1): 48–61
- 7 van Oppen MJH, Oliver JK, Putnam HM, Gates RD (2015) Building coral reef resilience through assisted evolution. *Proceedings of the National Academy of Sciences of the United States of America* 112(8): 2307–2313.

⁵ The majority of AIMS publication information (including collaboration data) is based on information collected across the calendar, rather than financial, year.

The average impact factor⁶ of journals in which AIMS published articles during 2015 was 4.57 (Thomson ISI). Thirty per cent of publications were in journals with impact factors greater than four.

Collaborative research accounts for a high proportion of our scientific publications: out of the 186 journal articles published by AIMS scientists, 52 per cent had co-authors from other Australian research organisations and 43 per cent involved international colleagues. Only nine articles (five per cent) were solely authored by AIMS staff (see Figure 9, page 60).

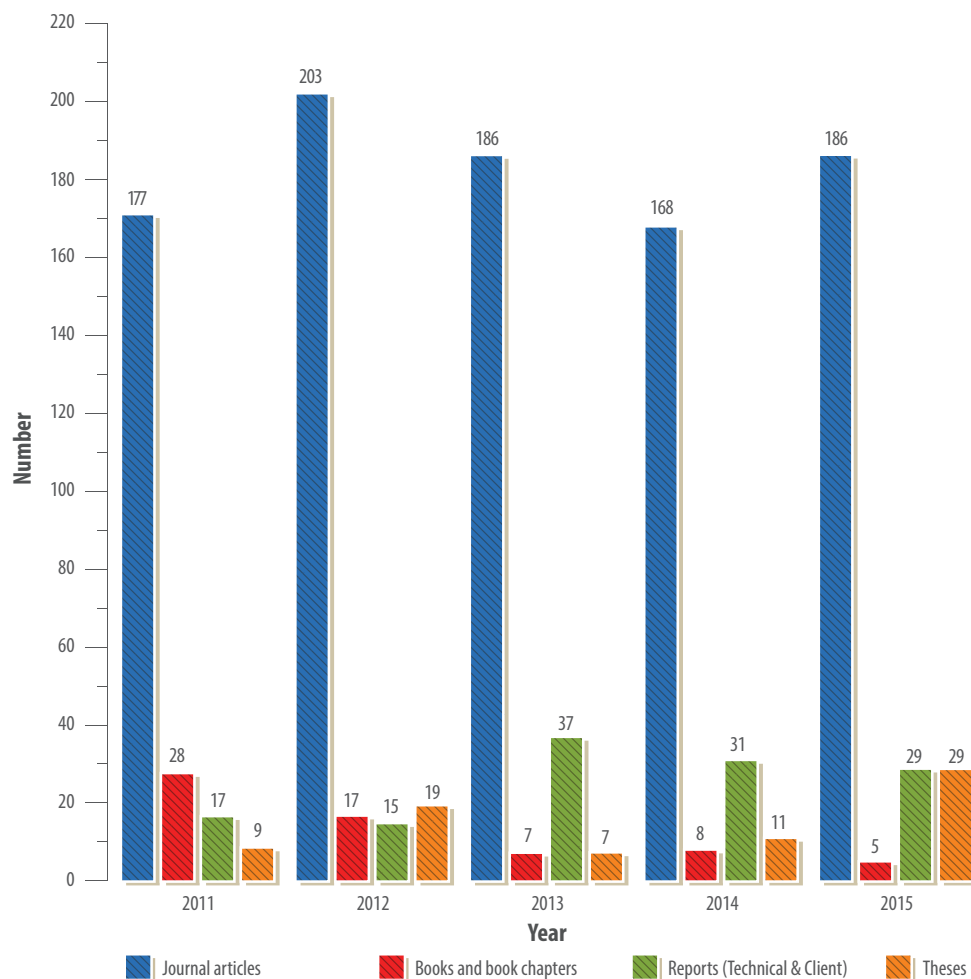


Figure 4: Number of AIMS publications by type (2011–15)

⁶ Journal impact factor is the average number of times articles published in a journal in the past two years have been cited in the citation year of interest. For example, if a journal has an impact factor of 4.25 in 2015, on average, any article published in that particular journal in 2013 or 2014 received 4.25 citations during 2015.

Leadership

AIMS plays a number of important science leadership roles, including setting research agendas through strategic workshops on key issues; giving keynote talks at international symposiums; and contributing to issues of national importance through input to government committees and policy projects. Here we outline several of the key leadership roles that AIMS has played during the year.

Contributing to issues of national importance

National Coral Bleaching Taskforce

The National Coral Bleaching Taskforce was formed to coordinate research and monitoring efforts among Australia's marine science community in response to the mass coral bleaching event in Australia; the most severe on record. The taskforce is an unofficial body that brought together researchers from 10 research institutions across Australia to coordinate surveys and data collection during the bleaching event and to facilitate collaboration on the data analyses that will continue well into 2017 and later. The taskforce was initiated by the Australian Research Council (ARC) Centre of Excellence for Coral Reef Studies (based at James Cook University, JCU) and included AIMS, GBRMPA, the US National Oceanic and Atmospheric Administration, CSIRO, University of Queensland (UQ), University of Sydney, University of Western Australia (UWA) and the Western Australian Department of Parks and Wildlife.

Reef Water Science Taskforce

AIMS was invited to be a member of the Reef Water Science Taskforce, chaired by Queensland Chief Scientist Dr Geoff Garrett, to provide expert advice on marine water quality. The taskforce was established to provide the Queensland Government with the best possible advice to meet its ambitious water quality targets and identify priority areas for investment of \$90 million to improve water quality both in the catchment and in the GBR. The taskforce found that even full application of best management practices across all farms in the Reef catchments would not achieve the targets, and therefore a strong focus on innovation, new technologies and different ways of thinking was required. After one year of reviews and deliberations, the final taskforce report was released in May 2016 (www.gbr.qld.gov.au/taskforce/final-report/). The report made 10 key recommendations, focusing on enhanced communication, increased levels of agricultural extension and innovation, expanded monitoring, financial and other incentives, and staged and targeted regulations. On 11 August 2016, the Queensland Minister for the GBR, Dr Steven Miles said the Government had agreed in principle with all 10 recommendations.

National Marine Science Plan

Australia's *National Marine Science Plan 2015–2025* was released in August 2015. The plan addresses the national marine science challenges identified in the *Marine Nation 2025* position paper, and works hand-in-hand with the national strategic Science and Research Priorities set by the Commonwealth Science Council, and with a number of other national and international efforts to prioritise ocean, earth system and climate science. The plan highlights areas where national collaborations will strengthen both science and end user communities, and recommends investment in national research infrastructure and high-priority science programs to maximise the marine sector's contribution to the growth of Australia's \$47 billion 'blue economy'.

The plan is a truly nationally collaborative approach to planning marine science in Australia. It was led by the National Marine Science Committee (NMSC), which comprised 23 representatives of research institutions, universities, industries and government departments with a stake in marine science (including the Department of Industry and Science, Geoscience Australia and CSIRO). AIMS provided strong leadership during the development of the *National Marine Science Plan 2015–2025* through the direct involvement of the following staff:

- John Gunn, Chair NMSC
- Dr Jamie Oliver, co-lead author Energy Security
- Dr Peter Doherty, co-lead author Biodiversity Conservation and Ecosystem Health
- Dr Lyndon Llewellyn, co-lead author Research Infrastructure
- Dr Terry Walshe, co-lead Resource Allocation
- Dr Gillian Treloar, lead NMSC Secretariat
- AIMS Communication, lead production and digital content.

Reef 2050 Long-Term Sustainability Plan

The *Reef 2050 Plan* aims to maintain and enhance the Reef's health and resilience while allowing ecologically sustainable development. Specifically, the plan aims to ensure that the outstanding universal value of the GBR continues to improve each decade between now and 2050, which will guarantee that the Reef remains a natural wonder for successive generations. The plan sets out concrete targets, actions, objectives and outcomes. It was developed in close collaboration with a partnership group involving government, key industry organisations, traditional owners, environment groups, researchers and the community.

AIMS continues to provide strong leadership in the implementation of the *Reef 2050 Plan* through the direct involvement of the following staff:

- John Gunn, member of the GBR Advisory Committee that oversees the implementation of the *Reef 2050 Plan*, and a member of the RIMReP Steering Committee
- Dr David Souter, Co-Chair of the Program Design Working Group responsible for overseeing the design of the RIMReP
- Dr Britta Schaffelke, member of both the Commonwealth and State Independent Expert Panels and the RIMReP Reporting and Synthesis Working Group
- Dr Eric Lawrey, member of the RIMReP Data Management and Integration Working Group.

Indigenous partnerships in marine science

AIMS has established a number of Indigenous partnerships with traditional owners in northern Australia. Within the WAMSJ Kimberley Marine Research Program, AIMS, with the help of the Bardi-Jawi Marine Ranger group and traditional owners of the Bardi and Jawi people, is investigating fish and coral recruitment processes in the Kimberley. Fish and coral recruitment processes are critical to marine ecosystem health because they underlie the replenishment of key marine communities. Particular attention was paid during the project design phase to closely align AIMS' research questions with goals outlined in the *Bardi-Jawi Indigenous Protected Area Management Plan 2013–2023* for fish and corals. Consultations with the rangers and traditional owners helped refine the research questions to specifically target monitoring the health of these communities and providing the type of science that helps the Bardi-Jawi Marine Rangers make informed management decisions.

AIMS is also working closely with the Land and Sea Rangers of the Anindilyakwa Land Council on Groote Eylandt to map the habitats of their sea country (in a project called 'Mapping Mukata'). The intent is to enhance traditional owner management of sea country and promote 'two-way' learning between the two collaborators.

Contributing to issues of international importance

Sino–Australian Centre for Healthy Coasts

In April 2015, AIMS and the Institute of Oceanology, Chinese Academy of Science (IOCAS), were awarded funding to establish a joint research centre under the Australia–China Science and Research Fund (ACSRF). The Sino–Australian Centre for Healthy Coasts (SACHC) will investigate and test management solutions for coastal pollution and ecosystem protection. The establishment of the centre further builds AIMS' relationship with IOCAS, following our joint signing of a memorandum of understanding in 2013 to foster collaborations in marine science. The centre will receive \$1 million over three years from the Australian Government matched with similar funding from the Chinese Government.

AIMS and their partner IOCAS have also committed to supporting 6 postdoctoral fellows and 10 PhD students. The Queensland Government, which has a well-established relationship with the Chinese Academy of Science through their Statement of Intent, has also committed \$100 000 to support the SACHC, noting that this is the first ACSR Joint Research Centre headquartered in Queensland. The SACHC will allow researchers from AIMS and IOCAS to collaborate on projects addressing major challenges to maximising the potential of the blue economy of both countries. Projects will focus on coastal biodiversity conservation and ecosystem health, sustainable coastal development, aquaculture and food security. Research conducted through the centre will initially focus on integration of monitoring data and model outputs to develop management tools to guide sustainable coastal use and development.

International workshop *Building coral reef resilience through assisted evolution*

In February 2016, AIMS, with the support of the Paul Allen Foundation, hosted numerous international experts at a workshop and public forum on human-assisted evolution. Assisted evolution (AE) encompasses a variety of techniques that seek to enhance desirable traits in plants or animals through the acceleration of naturally occurring processes at the gene level. AE approaches have been used to restore or assist the recovery of disturbed forest and rangeland ecosystems and to restore the population sizes of rare or threatened animals. In the marine realm, selective breeding, which has been applied in agriculture for millennia, is used to improve disease resistance in aquaculture species such as oysters. However, AE has not been applied in the conservation of marine organisms to date.

The primary objective of the workshop was to bring coral reef scientists and reef managers together with experts from other biological systems to learn from their expertise and experiences in applying AE approaches. Workshop participants agreed that the application of AE to corals is a departure from the traditional conservation perspective of sustaining and preserving coral reef ecosystems, but that a proactive stance is needed to offset the various current and predicted future pressures. The workshop outcomes will inform the future development of AE for coral restoration and enhancing coral resilience to climate change pressures.

International Society for Reef Studies recognises contribution of AIMS scientist

The International Society for Reef Studies conferred an Eminence in Research Award upon Dr Katharina Fabricius in recognition of her prodigious, long-term and diverse contribution to coral reef science. The society particularly noted her research on the ecology of soft corals and crown-of-thorns starfish, the impacts of water quality and terrestrial run-off on coastal marine systems and, most recently, her pioneering work at natural carbon dioxide seeps in Papua New Guinea examining the effects of ocean acidification on benthic ecosystems. The award was presented at the recent *International Coral Reef Symposium* held in Hawaii in June 2016.

Expert advice

AIMS gave expert advice and contributed to the following reports and reviews:

- Queensland Environment and Heritage Protection, *Proposed strategy for integrated water quality monitoring, modelling and reporting across Queensland*
- Queensland Department of Transport and Main Roads, *Maintenance Dredging Strategy*
- Northern Australian Aquaculture Inquiry *Opportunities for expanding the aquaculture industry in northern Australia*
- Australian Senate Environment and Communications References Committee, on the threat of marine plastic pollution in Australian and Australian waters
- Australian Senate Environment and Communications References Committee, on the Inquiry into large-capacity fishing vessels
- Australian Senate Inquiry into the GBR, through the provision of comments on the response package to the Department of the Environment
- Australian National Audit Office audit of the performance of the Reef Trust
- Queensland Department of Infrastructure, Local Government and Planning, on sea-based disposal of non-port-related capital dredged material in the parts of the GBRWHA within Queensland jurisdiction, discussion paper
- Publicly Funded Research Agencies joint paper on *Securing the future of Australia's National Research Infrastructure Portfolio*
- GBRMPA, on their permission system for activities within the GBR Marine Park
- *Burdekin dry tropics natural resources management plan*, draft plan
- *Mackay–Whitsunday water quality improvement plan 2014–2021*
- *Great Barrier Reef Water Science Taskforce interim report—December 2015*.

In addition, AIMS staff contributed in many committees and groups:

- John Gunn was the Co-Chair of the Intergovernmental Oceanographic Commission (IOC) Global Ocean Observing System (GOOS) Steering Committee.
- John Gunn was a member of the Reef 2050 Long-Term Sustainability Plan Reef Advisory Committee.
- John Gunn was a member of the Reef 2050 Long-Term Sustainability Plan RIMReP Steering Group.
- Dr David Souter was appointed Co-Chair of the Program Design Working Group.
- Dr Britta Schaffelke was a member of the Synthesis and Reporting Working Group.
- Dr Britta Schaffelke was a member of the Australian Government's GBR Independent Expert Advisory Panel.
- Dr Britta Schaffelke completed her tenure on the Queensland Government's GBR Water Science Task Force.
- Drs Britta Schaffelke and Richard Brinkman are members of the GHHP Independent Science Panel.
- Dr Eric Lawrey was a member of the Data Management and Integration Working Group.
- Dr Michelle Heupel was a member of the official Australian Government delegation to the Meeting of Signatories to the Convention on Migratory Species, Sharks Memorandum of Understanding. She was also appointed to the Conservation Working Group, which advises the Convention Secretariat.
- Drs Frederieke Kroon and Andrew Negri were members of the Queensland Government Pesticide Working Group.
- Dr Ross Jones is a member of the Dredging Technical Advice Panel for the Chevron Wheatstone Project in Western Australia.

Partnerships

AIMS has created, and participated in, an array of joint ventures, strategic alliances and significant collaborations that maximise the Institute's ability to deliver high-quality science. These arrangements increase the critical mass and diversify the skill base that can be applied to answer complex questions about the sustainable use, management and protection of marine resources. In 2015–16, the majority of AIMS' scientific tasks received external co-investment involving stakeholders and partners who actively participated in research design, implementation and knowledge dissemination.

AIMS is, or has been, a member of the following partnerships:

- the Arafura Timor Research Facility
- the North Australia Marine Research Alliance
- the ARC Centre of Excellence in Coral Reef Studies
- the Reef 2050 Plan Marine Monitoring Program
- the National Environmental Research Program Tropical Ecosystems Hub
- the National Environmental Science Programme Tropical Water Quality Hub
- the National Environmental Science Programme Marine Biodiversity Hub
- the Integrated Marine Observing System
- the Western Australian Marine Science Institution
- the Indian Ocean Marine research Centre
- AIMS@JCU
- the ARC Centre of Excellence for Mathematical and Statistical Frontiers of Big Data, Big Models, New Insights.

A brief synopsis of each of these partnerships is given below.

The **Arafura Timor Research Facility (ATRF)** was initiated in 2006, as a joint venture between AIMS and the Australian National University (ANU), with a mission to support marine science across northern Australia and other countries bordering the Arafura and Timor Seas (namely, Indonesia, Papua New Guinea and East Timor). With construction funding as a Major National Research Facility provided by the Australian Government, the ATRF consists of an office and laboratory complex in Darwin, and is adjacent to the campus of Charles Darwin University (CDU). A \$5 million upgrade during 2011–12, under the Australian Government's Super Science (Marine and Climate) Initiative, added a seawater research aquarium, modern meeting facilities, workshop facilities to support oceanographic research and additional offices. These offices house, among others, postdoctoral fellows and PhD students under the North Australia Marine Research Alliance.

At the end of June 2014, AIMS assumed sole management of the ATRF and has since initiated upgrades to improve efficiency of operation: a new chiller unit and solar panels have been installed. Science activities have continued to revolve around Darwin Harbour, but with a renewed focus on the Gulf of Carpentaria. Enhancing the aquarium facility has brought about exciting advances in tropical ecotoxicology. The Institute sees a strong need for marine research in the region, and finds itself well placed to realise this with the ATRF. Further details at www.atrf.org.au.

The **North Australia Marine Research Alliance (NAMRA)** brings together AIMS, CDU, ANU and the Northern Territory Government to build marine research capacity and capability in northern Australia. The NAMRA partnership focuses on postdoctoral fellowships and PhD scholars. The alliance partners are currently negotiating to establish a fresh long-term agreement to build on the successes of the first phase (2010–15). Further details at www.namra.net.au.

The **ARC Centre of Excellence for Coral Reef Studies (Coral CoE)** was established in 2005, and in 2013 received a further seven years and \$28 million of ARC funding. AIMS' CEO John Gunn is a member of the Coral CoE's Advisory Board, and two senior AIMS scientists, Drs Janice Lough and Madeleine van Oppen, are partner investigators. AIMS and the Coral CoE jointly support several postdoctoral fellowships over the life of the centre.

The Coral CoE undertakes world-best integrated research to provide the scientific knowledge necessary for sustaining ecosystem goods and services of the world's coral reefs. The renewed centre seeks to build bridges between the natural and social sciences, strengthening capacity and informing and supporting transformative changes in coral reef governance and management. The centre involves 30 chief and partner investigators from 10 organisations, including JCU, AIMS, UQ, ANU, UWA, GBRMPA, the WorldFish Center, Stanford University, the International Union for Conservation of Nature (IUCN) and the National Centre for Scientific Research.

The Coral CoE cements Australia's global leadership in coral reef sciences and strengthens collaborative links between the major partners and international collaborators from 40 countries. Further details at www.coralcoe.org.au.

The **Reef 2050 Plan Marine Monitoring Program (MMP)** was designed and developed by GBRMPA in collaboration with science agencies, and is currently funded under the *Reef 2050 Plan*. Managing water quality remains a strategic priority for GBRMPA, to ensure the long-term protection of the coastal and inshore ecosystems of the GBR. A key management tool is the *Reef Water Quality Protection Plan*, with the actions being delivered through the *Reef 2050 Plan*. The MMP forms an integral part of the Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef Program), which is a key action of the *Reef Water Quality Protection Plan*. The program is designed to report on progress towards, and evaluate the efficiency and effectiveness of implementation of, and the *Reef 2050 Plan* goals and targets. A key output of the Paddock to Reef Program is an annual report card, including an assessment of Reef water quality and ecosystem condition, to which the MMP contributes assessments and information. The report card is available at www.reefplan.qld.gov.au.

Since 2005, AIMS has provided the MMP with data from monitoring inshore water quality and the condition of inshore coral reefs. AIMS, in partnership with JCU, monitors the water quality of the receiving waters at 28 fixed sites along more than 700 km of coastline 3–11 times per year. In addition, AIMS surveys the health of 36 coastal and inshore coral reefs from the Wet Tropics to the Fitzroy Region on a biennial schedule.

Eleven years of monitoring provide clear evidence of large-scale changes in the quality of Reef waters. The findings indicate that the mechanisms controlling the carbon and nutrient cycles in the GBR lagoon have undergone changes in the monitored regions, with large increases in turbidity and the concentrations of dissolved organic carbon and dissolved inorganic nitrogen. The coincidence of these changes with a period of elevated run-off after periods of high rainfall suggests that these fundamental cycles respond to terrestrial inputs. Sustained improvements in the marine water quality of the inshore GBR are not yet observed in the MMP water quality program, despite some progress in improving land management practices and with river discharge at or below the long-term median in the last two years. This highlights the complexity of the relationship between river inputs and ambient water quality and the expected slow response timeframe.

The inshore coral reef survey data show that the cumulative impact of multiple disturbance events, including tropical cyclones, outbreaks of crown-of-thorns starfish, coral bleaching and a period of high discharge and associated nutrient

and sediment loads, combined to reduce coral community condition through to 2014. Changes in the measured resilience indicators (proportion of macroalgae in benthic algal communities, density of juvenile corals, rate of coral cover increase), were similar among regions and across environmental gradients. These indicators declined to low levels following a prolonged period with high volumes of run-off to the Reef lagoon. This consistent response across a wide range of taxonomic groups demonstrates the importance of run-off within the inshore Reef lagoon, and its broad 'footprint'. Improvements in the coral health index in all regions in 2015 coincided with low levels of run-off entering the Reef, and built on improvements recorded in 2014.

A summary of the MMP's overall goals and objectives, and descriptions of the subprograms, are available at www.gbrmpa.gov.au/managing-the-reef/how-the-reefs-managed/reef-2050-marine-monitoring-program and e-atlas.org.au/rrmmp.

The **NESP Tropical Water Quality Hub** is a collaboration among researchers from AIMS, CSIRO and four Queensland universities (Central Queensland University, Griffith University, JCU, and UQ), administered by the Reef and Rainforest Research Centre in Cairns. The hub has a transdisciplinary research model, with a focus on the water quality of the GBR and its associated catchments and the Torres Strait. The objectives are to: improve the understanding of the impacts, including cumulative impacts, and pressures on high-priority freshwater, coastal and marine ecosystems and species; maximise the resilience of vulnerable species to the impacts of climate change and climate variability by reducing other pressures, including poor water quality; and, identify natural resource management improvements based on sound understanding of the status and long-term trends of high-priority species and systems. To date the Tropical Water Quality Hub has distributed two rounds of funding, with annual funding rounds expected to 2019. Further details at www.nesptropical.edu.au.

The **Tropical Ecosystems Hub** of the **National Environmental Research Program (NERP)** completed its tasks in 2014. In 2015, it was replaced by the **Tropical Water Quality Hub** in north Queensland as part of NESP, funded by the Australian Government Department of the Environment (see above). The NERP Tropical Ecosystems Hub provided applied environmental science solutions over four years for stakeholders of the GBR, the rainforests of the Wet Tropics World Heritage bioregion, and the marine and terrestrial habitats of the Torres Strait. Its research was designed to: improve environmental decision-making processes in regionally based natural resource management agencies (including the Torres Strait Regional Authority, the Wet Tropics Management Authority and GBRMPA); influence the formation of environmental policy by Australian governments; and, inform and influence other stakeholders (industries, non-government organisations and Indigenous organisations).

The **NESP Marine Biodiversity Hub** is a collaborative partnership supported by Australian Government NESP funding, which is administered by the Department of the Environment. The Marine Biodiversity Hub will research Australian oceans and marine environments, including temperate coastal water quality and marine species, with funding of \$23.88 million through the University of Tasmania (UTAS). The Marine Biodiversity Hub is a collaboration among researchers from AIMS, CDU, CSIRO, Geoscience Australia, IMOS, Museum Victoria, NSW Department of Primary Industries, NSW Office of Environment and Heritage, UTAS and UWA.

Research is conducted within four themes: improving the management of marine threatened and migratory species; supporting management decision-making; improving our understanding of pressures on the marine environment; and, improving our understanding of the marine environment, including biophysical, economic and social aspects.

The **Integrated Marine Observing System (IMOS)** is a foundation national marine observing capability established in 2006 by the Australian Government's National Collaborative Research Infrastructure Strategy (NCRIS). IMOS provides infrastructure and a free, open-access data portal for a national system of sustained observations on ocean variability covering physical, chemical and biological variables, with data streams collected throughout the Australian marine territories. The operational model of IMOS distributes the responsibility for observing infrastructure across operating institutions comprising universities, state and federal agencies and publicly funded research agencies, including AIMS. 2016 marks a decade of IMOS operation, throughout which AIMS has been an active partner and operator of infrastructure across Australia's vast and remote tropical marine estate. As the lead agency of the Queensland Node, and primary operator of a number of IMOS facilities, AIMS has made a significant contribution to collaborative science planning and operational implementation of a national marine observing vision.

The first decade of IMOS has demonstrated that a collaborative, integrated approach to marine observation can deliver sustained benefits for marine management and improved weather prediction in the sea and on the land; and can reveal the critical contribution of the oceans to our ever changing climate. The value of IMOS to Australia's blue economy is recognised in the decadal *National Marine Science Plan 2015–2025*, which recommends sustaining and expanding IMOS, as one of its eight high-level recommendations. The Australian Government's 2015 National Innovation and Science Agenda includes an ongoing commitment to NCRIS of \$1.5 billion over the next ten years. It is expected that, during 2016, Australia's Chief Scientist will identify specific future research infrastructure capability requirements and funding models for NCRIS capabilities.

Further details at www.imos.org.

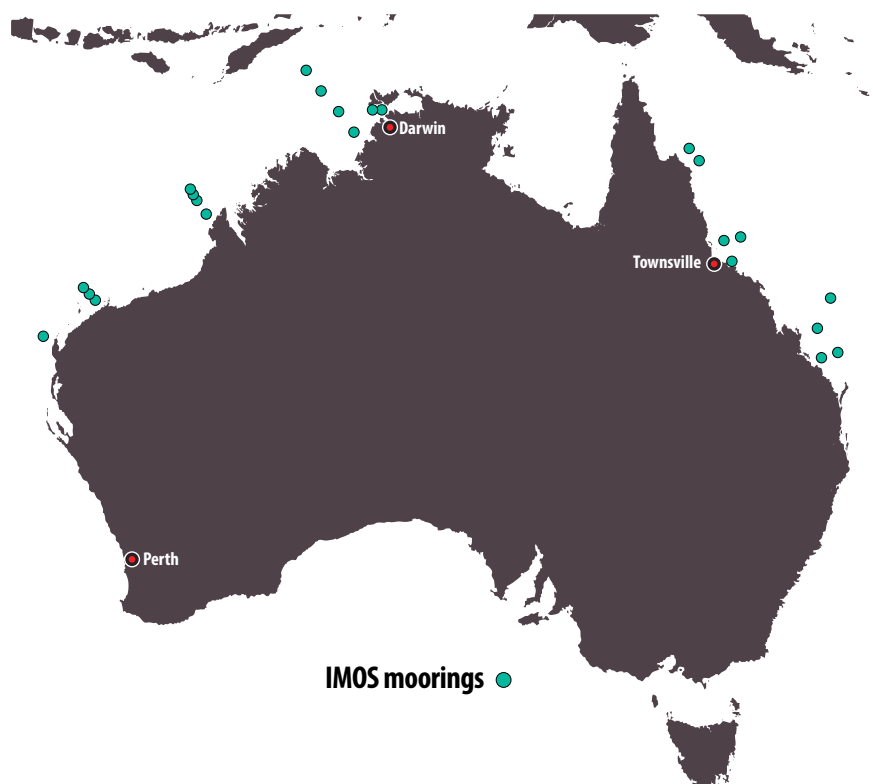


Figure 5: Location of IMOS moorings.

The **Western Australian Marine Science Institution (WAMSI)** is a partnership of four Western Australian universities (UWA, Murdoch University, Edith Cowan University, and Curtin University); a major resource company (WEL); three Commonwealth organisations (CSIRO, AIMS and the Bureau of Meteorology); four Western Australian Government departments (Parks and Wildlife, Premier and Cabinet, Fisheries and the Environmental Protection Authority); the Western Australian Museum; ChemCentre; and a regional ocean observing network for the Indian Ocean (WA GOOS). WAMSI was established to improve knowledge and understanding of Western Australia's marine environment for better resource development, management and conservation outcomes. WAMSI was launched in May 2007 with an initial investment of \$21 million over five years from the state government. In 2011–12, the Western Australian Government provided \$12 million over six years for the institution's continued development. In each case, these funds generated matching investments from WAMSI research partners, providing substantial leverage of the government funds to target high-priority marine science needs in Western Australia.

WAMSI's ability to deliver programs, such as the \$30 million Kimberley Marine Research Program, draws on the capability of 200 scientists from 11 partner organisations. Importantly, the projects in the Kimberley region have been developed to have significant engagement and partnership with local Indigenous groups. Indigenous traditional owners and sea rangers are now taking part in the field components of the WAMSI Kimberley program at Cygnet Bay, Cape Leveque and Sunday Islands, and Camden Sound.

WAMSI also partners with industry to deliver programs that benefit both industry and the community, such as the \$18 million Dredging Science Node. The Dredging Science Node was established in 2011–12 to understand and mitigate the impacts of coastal dredging, which is a critical component of most major marine infrastructure developments in Western Australia. In order to meet the objectives of the node, AIMS researchers have established a series of experiments in the SeaSim aquarium facility in Townsville to examine the impacts of dredging sediment on key marine taxa, such as corals and sponges.

Further details at www.wamsi.org.au.

The **Indian Ocean Marine Research Centre (IOMRC)** is a joint venture that unites the four leading Australian research organisations working in and around the Indian Ocean (AIMS, CSIRO, UWA and the Western Australian Department of Fisheries).

The collaboration includes developing new multidisciplinary research teams and creating a graduate training environment that will significantly advance Australia's marine science capacity, capability and profile.

Due for completion in September 2016, a new IOMRC building located on UWA's Crawley campus will contain the largest concentration of marine research capability in the southern hemisphere, and the largest research capability in marine research on the Indian Ocean Rim.

The Department of Fisheries' Watermans Bay Marine Centre underwent significant refurbishments, including upgrades to the internal laboratories, offices and marine cultural facilities, with direct access to high-quality seawater. IOMRC partners began taking occupancy in 2016.

These building projects were initiated in the 2010–11 financial year, with UWA awarded \$34 million from the Australian Government through the Education Investment Fund Round 3 for the IOMRC project, and co-investment of \$29 million.

Further details at www.oceans.uwa.edu.au/iomrc.

AIMS@JCU is a strategic partnership between two global leaders in tropical marine science: AIMS and JCU. It was created to take advantage of their co-location in Townsville and enhance collaborative opportunities through joint higher degree by research (HDR) and early-career research (ECR) training in tropical marine sciences, and also to facilitate sharing of research infrastructure. AIMS@JCU began as an unincorporated joint venture in 2004 with a special allocation of funds from the Australian Government. Despite this funding ending after five years, both organisations recognised the success of the AIMS@JCU approach and opted to transition from the original joint venture structure and continue as a jointly funded strategic alliance, with a focus on joint HDR training.

AIMS@JCU has made a tangible contribution towards training the next generation of marine scientists. Since 2004, a total of 91 PhDs have been awarded through the program, and the number of new AIMS@JCU graduates has steadily increased each year. By facilitating the link between JCU's research education strategy and AIMS' research plan, AIMS@JCU has delivered significant value beyond the dollar investment, including an enhanced completion rate (compared to the JCU average), more research outputs (40 per cent of AIMS' 2015 publications were co-authored by an AIMS@JCU student), and cohorts of graduates with experience working within a publicly funded research agency. Such industry exposure within HDR training is a key recommendation of the 2016 Australian Council of Learned Academies *Review into Australia's Research Training System*.

Through a management committee and a scientific advisory committee which includes representatives from both organisations, AIMS@JCU is able to flexibly and strategically focus the research supported by the program. Most recently, to focus on the growing skills gap in quantitative marine science (as identified in the *National Marine Science Plan*), AIMS@JCU has restructured its scholarships to four years (instead of the usual three years), with the extra year plus additional funding available for professional quantitative development customised on a case-by-case basis by each student and their advisory team. In addition to these sponsored PhD scholarships, the AIMS@JCU program facilitates a wide range of other PhD and MSc projects within AIMS' research strategy and co-supervised by an AIMS staff member. AIMS@JCU also: offers competitive funding awards to students for project costs, travel and science communication; positions students within an extensive network of peers; and facilitates a range of additional professional development opportunities (for example, courses in science writing, media training and biostatistics).

AIMS@JCU also supports an improved pipeline of quantitatively literate PhD applicants, through fostering 'work integrated learning' placements for undergraduates, and dedicated science, technology, engineering and mathematics (STEM) programs for high schools. The latter include those focused on Indigenous participation (for example, Aboriginals and Torres Strait Islanders in Marine Science (ATSIMS) and the Aboriginal Summer School for Excellence in Technology and Science (ASSETS)).

AIMS@JCU currently has 271 members, of which 50 are PhD students and 61 are other students (MSc or undergraduate). Fifteen of these students are recipients of an AIMS@JCU scholarship.

Further details at www.aims.jcu.edu.au.

The **ARC Centre of Excellence for Mathematical and Statistical Frontiers of Big Data, Big Models, New Insights (ACEMS)** successfully attracted seven years of funding from the Australian Government in December 2013. The centre commenced operation this financial year with launches at both the University of Melbourne and the Queensland University of Technology (QUT). ACEMS will tackle the massive amounts of data collected daily in a variety of forms and from a multitude of sources. Many of the resulting datasets have the potential to make vital contributions to society, business and government, but are so large or complex they are difficult to process and analyse using traditional tools.

The new centre, which is led by the University of Melbourne, will bring AIMS scientists together with a world-class set of collaborators and partner organisations, including the University of California, Berkeley; QUT; University of Adelaide; University of Oxford; University of Technology Sydney; University of New South Wales; UQ; Harvard School of Public Health; CSIRO; Sax Institute; Australian Bureau of Statistics; Mathematics of Information Technology and Complex Systems, Canada; University of British Columbia; Vic Roads; and, AT&T Labs-Research.

ACEMS aims to create innovative mathematical and statistical models that can uncover the knowledge concealed by the size and complexity of these big datasets. From a marine science perspective, the collaboration will let AIMS, and others, add value to the data collected on the GBR in order to increase our knowledge of the Reef and its processes, and improve Reef management. A workshop in May 2015 brought together researchers from AIMS and ACEMS to explore potential collaborations that could help address analytical issues important to AIMS. Possible areas of collaboration include exploring: hidden Markov models of shark behaviour; Gompertz models of coral cover trajectories; functional analysis using ordination with uncertainty; and the transferability of predictive models of biodiversity.

Further details at www.acems.org.au.

Fostering research capability

AIMS is committed to ECR training to help develop the research and innovation capacity needed to meet the opportunities and challenges facing the marine environment, and to keep Australia globally competitive. AIMS maximises its impact by providing a number of opportunities to develop a research career, including:

- postdoctoral studies
- postgraduate studies
- scholarship funding for postgraduates
- occupational trainees
- exposing Indigenous high school students to marine science.

Postdoctoral research

During the reporting period, six co-funded fellowships were finished.

At 30 June 2016, AIMS supported 13 postdoctoral fellows (also see Figure 6):

- three under the NAMRA partnership
- one under the IOMRC partnership (round 3)
- one supported by the Coral CoE
- one funded by Mitsubishi
- one funded by the Northern Research Futures Collaborative Research Network
- two under the AIMS–QUT Memorandum of Understanding
- two at AIMS
- two funded by the Vulcan Foundation within the Global FinPrint Project.

One additional fellowship co-funded with the Coral CoE has been advertised.

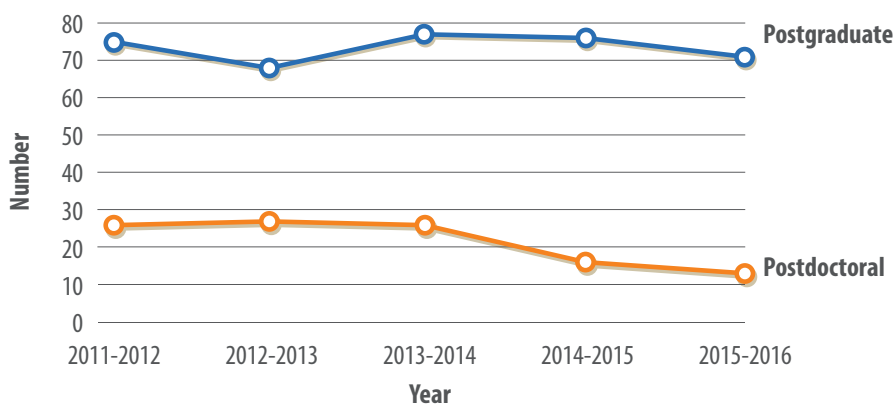


Figure 6: Number of AIMS postgraduate and postdoctoral researchers

Postgraduate studies

AIMS' involvement in ECR training is reflected in the fact that 30 staff members hold adjunct academic appointments at Australian and/or international institutions, including at:

- James Cook University, primarily within the Coral CoE, the College of Science and Engineering, and the Division of Research and Innovation (through the AIMS@JCU partnership)
- the University of Queensland
- the University of Western Australia
- Charles Darwin University
- Queensland University of Technology
- Swinburne University of Technology
- Dalhousie University, Canada
- the University of Windsor, Canada
- the University of Auckland, New Zealand
- Victoria University, New Zealand.

Most of these adjunct positions reflect a large personal contribution to postgraduate supervision.

AIMS staff supervised 71 postgraduate students during 2015–16 (see Table 4 and Figure 6), comprising:

- 29 at AIMS Townsville
- 5 at UWA Oceans Institute
- 37 studying externally at their respective universities.

Table 4: Number of AIMS postgraduate students

Postgraduate student	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16
AIMS science staff enrolled in postgraduate studies	2	1	0	0	0	0
Students working at AIMS supervised by AIMS staff	28	29	26	31	34	34
Students working externally supervised by AIMS staff	46	45	42	46	43	37

Twenty-three PhD and MSc degrees were awarded during the period.

Occupational trainees

AIMS supported 10 trainees, who improved their occupational skills through on-the-job training with AIMS researchers and technicians (see Table 5).

Table 5: Number of occupational trainees

Trainee	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16
Occupational trainees	15	18	13	9	18	10

Exposing Indigenous high school students to marine science

The Aboriginals and Torres Strait Islanders Marine Science (ATSIMS) Scholars' Initiative was established in 2013 by AIMS@JCU postgraduate student Joe Pollock. The initiative was designed to engage Indigenous high school students in field-based science programs to bolster the interest, experience and hands-on skills needed to initiate, and succeed in, tertiary studies in marine science.

Each year, Indigenous high school students from the north Queensland district (Cardwell, Ingham, Burdekin and Heatley (Townsville)) engage in interactive workshops at AIMS under the guidance of marine researchers and Indigenous leaders. The program endeavours to foster linkages between western marine science and traditional ecological knowledge. In addition to the support it receives from AIMS, the ATSIMS program is supported by JCU (Australian Aboriginal and Torres Strait Islander Centre), the Coral CoE, AIMS@JCU, World Wildlife Fund, Gudjuda Reference Group Aboriginal Corporation, Giringun Aboriginal Corporation, GBRMPA, Department of Environment and Heritage Protection, and Glencore. On 2 June 2016, ATSIMS was announced as the winner of the education category in the 2016 Queensland Reconciliation Awards. These awards recognise businesses, community organisations, educational institutions and partnerships fostering reconciliation in Queensland.

Research collaboration

AIMS has a strong culture of collaborating with external organisations worldwide (see Figure 8), which helps us expand our science capabilities and capacity. In 2015, AIMS scientists participated in 159 collaborative projects with Australian and international scientists (see Figure 7).



Figure 7: Number of AIMS collaborative projects by year⁷

The statistics are impressive. In 2015, AIMS scientists were involved in:

- 159 collaborative projects
- conducted in 26 countries
- involving 165 Australian scientists
- from 40 Australian organisations⁸
- with 96 overseas colleagues
- from 64 overseas organisations
- involving scientists from 23 countries.

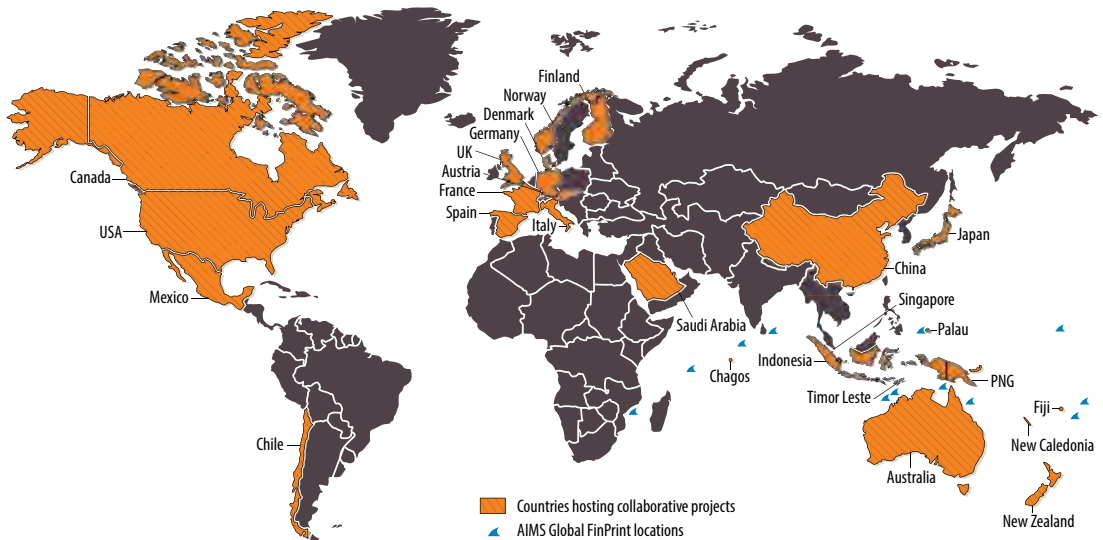


Figure 8: Location of AIMS' international collaborations.

⁷ AIMS' collaboration data are based on information collected across the calendar, rather than financial, year.

⁸ This figure includes five organisational units within CSIRO, namely, CSIRO Land and Water; CSIRO Information and Communication Technologies; and CSIRO Marine in Hobart, Perth and Brisbane.



Figure 9: Proportion of collaborative publishing

Collaborative research accounts for a high proportion of our scientific publications: out of the 186 journal articles published by AIMS scientists, 97 (52 per cent) had co-authors from other Australian research organisations and 80 (43 per cent) involved international colleagues. Only nine articles (five per cent) were solely authored by AIMS staff (see Figure 9).

In addition to these research collaborations, in 2015–16 AIMS signed memorandums of understanding with three international and one Australian research organisations, and a local arts group:

- Geoscience Australia—for collaboration in the Darwin office
- Universidad Simon Bolivar, Venezuela—to promote cooperative activities in teaching, research and science
- La Luna Youth Arts, Townsville—where a pre-selected artist created an artistic video based on knowledge and footage gathered during an MMP field trip
- Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Germany (as Chair of the Partnership for Observation of the Global Oceans (POGO))—the MoU sets out the general principles of the POGO membership
- Collecte Localisation Satellites, France—to assist in optimising the functioning of the Argos satellite-based animal tracking system and provide improved data delivery times for Argos platforms transmitting in the satellite footprint of the receiving station.

Science quality assurance

AIMS uses a centralised milestone reporting system to ensure it remains on track to deliver its research to stakeholders and end users. The nature and timing of milestones are agreed between AIMS and external clients and partners.

More than 60 per cent of AIMS' external contract milestones were completed by the original negotiated date. The remaining milestones were delayed; mostly due to setbacks beyond AIMS' control, such as bad weather and delayed delivery by collaborators and/or suppliers. In all cases, acceptable alternative arrangements and revised milestone dates were successfully negotiated with the external party.

Data management and dissemination

A Data and Technology Innovations Research Program underpins AIMS' other three research programs, with one of its roles being to advance the Institute's research data management capability. It is home to the AIMS Research Data Centre, which is dedicated to managing and securing the Institute's data and making it globally accessible via the internet. Our metadata and maps of AIMS' research data are also included in the Australian Ocean Data Network (AODN) Portal and the Research Data Australia data catalogue, growing Australia's national datasets.

AIMS currently deploys and supports environmental sensors on oceanographic moorings and reef platforms, and in robotic gliders and autonomous underwater vehicles. We support environmental measurements from space and automatically sample and analyse seawater as our research vessels traverse Australia's tropical seas. We also maintain arrays of acoustic receivers to track mobile animals. Together, these tools help to provide a picture of the variations in temperature, salinity, water quality and ocean acidity of Australia's coastal seas, largely as part of our role as a major operator of facilities within Australia's IMOS.

Our landmark datasets critical to national and international stakeholders in marine science include:

- the AIMS Long-Term Monitoring Program, which has been surveying numerous reefs throughout the GBR for several decades. To date, this database includes more than three decades of observations and measurements from 292 reefs
- data for the Reef 2050 Plan MMP (see page 30), an initiative within the *Reef 2050 Plan*.

Some of the most substantial data holdings at end of 2015–16 are shown in Table 6.

Table 6: Number of data sampling sites and records

Measurements	Number of sites	Number of records 2015–16	Increase on previous year
Chlorophyll, turbidity and temperature	22	5 696 151	11.6 %
MMP Samples	1410	8747	8.5 %

Building on these and other datasets, AIMS also develops tools to let others interrogate and visualise the state of Australia's tropical marine estate. The eAtlas is an interactive mapping tool developed by AIMS to help users display, access and interrogate our marine data and data from other organisations. Several versions have been tailored to the needs of specific stakeholders, the largest being that for the NERP Tropical Ecosystems Hub (see page 31) and versions developed for the Torres Strait, Ningaloo and north-west Australia. The eAtlas currently hosts over 3482 data layers produced from 44 projects involving 15 organisations. eReefs, which commenced in January 2012, is a six-year \$30 million collaborative project developed to revolutionise how we manage and protect the GBR. This dynamic three-dimensional model, which covers the 340 000 km² of the GBR, uses cutting-edge techniques and approaches to convert data and sophisticated models into user-friendly visualisation, communication and reporting tools. Government agencies, managers, policymakers, researchers, industry and local communities are all starting to use the eReefs tool to better understand the Reef and make decisions.

AIMS' online data delivery is a core part of our digital presence. Use of some of our key data products in 2015–16 is shown in Table 7.

Table 7: User access figures for AIMS' digital information

Purpose	Number of visitor sessions (change from previous year)	Number page views (change from previous year)
Data searches	16 300 (+22%)	22 600 (+12%)
Reef weather	179 000 (-3%)	580 000 (+26%)
Coral fact sheets	95 000 (-4%)	426 000 (+4%)

AIMS also engages with national data initiatives to achieve a nationally consistent approach to Australia's environmental data by being members of data policy and technical advisory groups. For instance, AIMS staff are members of the AODN Technical Advisory Group, the Australian Government Science ICT Network Committee, as well as being proactive with IMOS quality control and assurance efforts.

Stakeholder engagement

A suite of operating principles guide AIMS' research, internal and external relationships, and organisational ethos. They inform and underline the Institute's focus on supporting its key stakeholders.

Our guiding principles are:

- **Trust**—AIMS is a trusted adviser, delivering independent, evidence-based scientific advice to our stakeholders for the economic, environmental and social good of Australia
- **Focused research**—AIMS executes focused research plans with identified pathways to impact
- **Knowledge transfer**—AIMS documents and widely disseminates findings through a variety of mechanisms and formats to a wide range of stakeholders and collaborators
- **Excellence and innovation**—AIMS undertakes high-calibre research
- **Return on investment**—AIMS maximises the returns on investment in marine science through collaborations, co-investment and contracting of industry-funded research
- **Health, safety and environment**—AIMS leads the way in providing safe working conditions and ensuring that our activities are planned to minimise any adverse environmental impacts.

AIMS works closely with stakeholders to identify their needs, and develop research programs with the highest possible value to these stakeholders, over both short and long timeframes. We achieve this by mapping how the research will be used and who will benefit, then reviewing outcomes and completed research programs. Within this process, AIMS takes a big-picture view of Australia's marine science challenges, asks questions, anticipates future needs and strategically invests in research targeted at reducing future uncertainty.

Stakeholders benefiting from AIMS' activities in 2015–16 include those listed in the Table 8.

Table 8: Stakeholders benefiting from AIMS' activities in 2015–16

Stakeholder category	Sector/organisation	Examples of AIMS' support
Industry	North-western Australia oil and gas industry	<ul style="list-style-type: none"> • Developing environmental baselines that help industry plan and manage their environmental risks and regulatory compliance • Providing a rapid response research capability to optimise management actions should a spill occur • Providing guidance on minimising the adverse environmental impacts of dredging operations, as a member of industry expert panels • Supporting the development of collaborative industry sharing of marine environment data
Industry	Commodity ports/ Northern Territory Government, Darwin Ports Corporation	<ul style="list-style-type: none"> • Developing systems to improve Darwin Harbour operational efficiency, and environmental research to inform development decisions • Researching the impacts of dredging to develop better risk-based dredging protocols
Industry	Coastal industries	<ul style="list-style-type: none"> • Researching inputs to monitoring programs for regulatory compliance • Applying new technologies for in situ monitoring to more effectively manage dredging operations and environmental regulatory compliance • Studying water quality to validate hydrodynamic modelling of effluent diffusion

Continued over page

Stakeholder category	Sector/organisation	Examples of AIMS' support
Public and government	Australian Government and public	<ul style="list-style-type: none"> • Developing a framework to assess the cumulative impact of natural and development stresses on the GBR • Researching coral health in a variable and changing marine environment to assess coral reef resilience, and potential intervention and management options • Researching ecosystem processes and crown-of-thorns starfish outbreaks to increase our understanding of outbreak impacts and improve our ability to forecast and manage outbreaks • Developing a mapping system for presenting environmental research data in an accessible form that promotes greater information use • Assessing the impact of saltwater intrusion on floodplain soil communities in the Northern Territory • Educating the public and stakeholders, via the website and with site tours, on the state of environmental knowledge and any gaps and risks • Supporting postgraduate students as a means of enhancing the marine research workforce in tropical Australia • Providing regular six-weekly briefs to Australian Government ministers responsible for science, identifying significant published and emerging AIMS research findings • Providing expert marine science advice and interpretation to Australian Government ministers and their science advisers on key marine science developments, such as the 2016 coral bleaching event • Supporting the education and future employment potential of northern Australia's Indigenous youth through the ATSIMS program.

Continued over page

Stakeholder category	Sector/organisation	Examples of AIMS' support
Public and government	Queensland Government and public	<ul style="list-style-type: none"> Researching the impact of changed land-use practices on water quality in the GBR Marine Park Contribution to the recommendations of the Queensland Water Quality Taskforce for future investments to improve catchment water quality
Public and government	Western Australia Government and public	<ul style="list-style-type: none"> Identifying and characterising biodiversity patterns and underlying processes in the Kimberley to aid effective management Surveying sensitive seabed organisms to evaluate impacts of dredging operations Researching the impacts of dredging to inform guidelines for marine dredging programs.
Managers and regulators	Great Barrier Marine Park Authority	<ul style="list-style-type: none"> Monitoring the health of the GBR in ongoing surveys Providing specialist advice to, and peer review of, development activity impacts Contributing to the planning for the development of RIMReP

Stakeholder survey

AIMS commissioned an online stakeholder survey in June 2015. The survey was administered independently by Quinttessential Marketing Consulting. It was designed to obtain information on:

- how stakeholders see the role of AIMS and their perceptions of AIMS
- how stakeholders receive (and prefer to receive) information from AIMS
- to what degree our stakeholders see AIMS' research as relevant to their needs
- how stakeholders engage with AIMS and their view on the ease of engagement (or any barriers to engaging) with AIMS

Key findings from respondents of the survey include:

- Almost 70 per cent indicated that they know that AIMS is open to collaborations and know who to contact.
- More than 80 per cent of respondents cited their reason for engaging with AIMS as seeking authoritative scientific advice (based on AIMS skills and/or capabilities) that was important to their organisation.
- Almost 85 per cent noted no barriers to accessing AIMS personnel or equipment.
- 80 per cent viewed AIMS as most closely aligned with the Australian Government and research organisation sectors.
- More than 60 per cent obtain information about (or from) AIMS through the AIMS website and by direct engagement. Social media was the least preferred method.
- Respondents saw AIMS as very relevant to Australia's environment and relevant to Australia's economy and society.
- The top two reasons selected for engaging with AIMS were: to collaboratively engage with AIMS; and, to obtain high-quality research that is relevant to their organisation.
- Approximately 50 per cent engaged with AIMS because 'AIMS is the best in its field—my first choice'.

Overall the responses to the survey indicated that AIMS' research is aligned and relevant to the needs of users. AIMS' research is viewed as high quality and highly trusted. The openness of AIMS to collaboration and partnership in science is highly valued and an area of strong performance. This is also supported by the large number of formal agreements in place with other research institutions and users of our research.

Public communication

AIMS improves community-wide understanding of key issues relating to Australia's tropical marine environment through an ongoing public communication program which includes social media activities, web-based delivery of information resources, newsletters, participation in public events and displays and tours of its research facilities at Cape Ferguson. AIMS' research outputs are actively promoted to print and broadcast news media outlets and the insights of AIMS researchers are regularly sought by journalists seeking to add an authoritative voice to their material. These activities, when combined with undertakings more tightly targeted to the interests of key stakeholder groups, help to build support for the Institute's efforts to ensure the best economic, environmental and social outcomes for Australia.

Stakeholder-focused activities undertaken during the reporting period ranged from public science forums such as *Unravelling the science behind climate-proof corals* to the production and distribution of a series of marine science fact sheets on the health of the GBR; crown-of-thorns starfish; water quality; ocean acidification; and the impact of dredging. AIMS provided a series of clear, concise and evidence-based contributions to the often emotively-charged public discussion about impacts of the coral bleaching outbreak that affected both the GBR and reefs in Western Australia in March and April 2016. The findings of research articles relevant to issues such as declining water quality and the possible impact of pollutants on the GBR were discussed openly, and without bias, with the news media—providing stimulus for important community conversations.

In April 2016, after more than two years in production, the BBC One—commissioned natural history series *David Attenborough's The Great Barrier Reef* went to air in Australia. The three-part documentary, supported by an online resource called *David Attenborough's Great Barrier Reef: an interactive journey*, focused on the past, present and future of the Reef. When first invited to contribute in late 2013, AIMS saw the project as an extraordinary opportunity to increase awareness of the need for science-based management and protection of the GBR and tropical marine systems in Australia and around the world. Both the documentary and the online resource featured AIMS research and researchers: parts of 'Survival' (episode three of the series) and 'Understanding the Reef' (chapter two of the online resource) were produced at AIMS' Cape Ferguson headquarters. Production of the series featured the use of emerging technologies such as 360° video—an approach to storytelling that AIMS is now using in its efforts to help audiences visualise reef environments in a more 'immersive' format.

Research infrastructure

AIMS' research activities primarily focus on Australia's tropical marine environments, from the southern end of the GBR on the east coast to Shark Bay and the Abrolhos Islands in the west. Field activities are supported by laboratory and administrative facilities located at Townsville, Darwin and Perth.

AIMS' headquarters at Cape Ferguson, about 50 km from Townsville in north Queensland, is close to the centre of the GBR and surrounded by national park and marine reserve. AIMS' Darwin facility is the ATRF, located on a satellite campus of the ANU, immediately adjacent to the CDU campus. In Western Australia, AIMS is co-located with the UWA Oceans Institute at the university's Crawley campus in Perth.

The IOMRC is a joint venture that unites the four leading Australian research organisations working in and around the Indian Ocean (AIMS, CSIRO, UWA and the Western Australian Department of Fisheries).

The start of construction of works for a new IOMRC building located on UWA's Crawley campus was officiated by the Hon. Julie Bishop, MP, on Friday 30 May 2014. Due for completion in September 2016, the new building will contain the largest concentration of marine research capability in the southern hemisphere, and the largest research capability in marine research on the Indian Ocean Rim.

The SeaSim is a world-leading experimental aquarium facility that provides researchers with unprecedented experimental control of a range of variables, allowing investigation of individual and combined effects on tropical marine ecosystems and organisms. It provides a step-change in capability compared with previous technologies, and is an essential element for the success of all of our research programs. AIMS has made up to 50 per cent of the SeaSim's capability available to scientists and research institutions from around Australia and the world to work on collaborative research projects with AIMS staff.

The SeaSim's capability has been applied to a range of high-priority research areas, including impacts of dredging and dredge spoils on marine ecosystems, climate change and ocean acidification, marine diseases and pests, ecotoxicology and water quality. Over 80 per cent of all experiments undertaken in the SeaSim have involved collaborators from over 8 national and 10 international organisations. Projects have attracted funding from a range of sources including industry partners, universities, ARC, WAMS, NESF and the Paul Allen Foundation.

AIMS' major research infrastructure is subject to detailed capital planning and asset management programs to ensure that required reliability, availability and functional performance are achieved. Delivery against preventative maintenance and capital investment plans is monitored throughout the year to ensure that targeted outcomes are met.

Marine operations

AIMS' field activities are supported by a research fleet that provides access across Australia's tropical marine environments. Two large purpose-built research vessels, the RV *Cape Ferguson* and the RV *Solander*, and a number of smaller vessels, take researchers to the diverse habitats that make up Australian waters.

AIMS' major vessels are equipped with a wide range of facilities essential for long research trips, such as:

- on-board dive compressors
- a moon pool for deploying sensitive hydrographic and oceanographic instruments through the deck of the RV *Solander*
- A-frame, hydrographic, and conductivity, temperature and depth winches
- wet and dry laboratories
- flow-through aquaria
- large deck spaces
- inflatable tenders
- sophisticated navigation, satellite communication and computing facilities.

AIMS researchers took part in 150 field trips during the 2015–16 financial year. Eighty-six trips involved diving and snorkelling, with a total of 2382 scuba dives performed.

Research trips involving the two largest AIMS vessels (the RV *Solander* and RV *Cape Ferguson*) covered 43 000 nautical miles (see Figure 10). Together, the entire fleet of AIMS research vessels was involved in 107 field trips conducted by 497 research personnel during 599 days in the field. Approximately half of all trips on the RVs *Cape Ferguson* and *Solander* involved researchers from collaborating organisations.

While the large vessels (*Cape Ferguson* and *Solander*) were used at close to 100 per cent of available capacity, AIMS was still required to charter a further 129 days on third party vessels, primarily in the GBR, Torres Strait and Darwin areas, in order to meet our research commitments for the year.

Table 9 gives a summary of the number of trips taken by each AIMS vessel during the reporting period.

Table 9: Research trips by AIMS’ vessels

AIMS vessel	Research trips	Number of researchers involved	Time in the field (days)	Distance travelled (nautical miles)	Researcher days in field
RV Solander	17	130	242	23 796	1 989
RV Cape Ferguson	25	152	256	19 288	1 568
RV Apollo	35	127	36	N/A	131
RV Pisces	8	17	11	N/A	23
RV Aquarius	21	69	53	N/A	164
RV Capricornus	1	2	1	N/A	2
Total	107	497	599	–	3 877

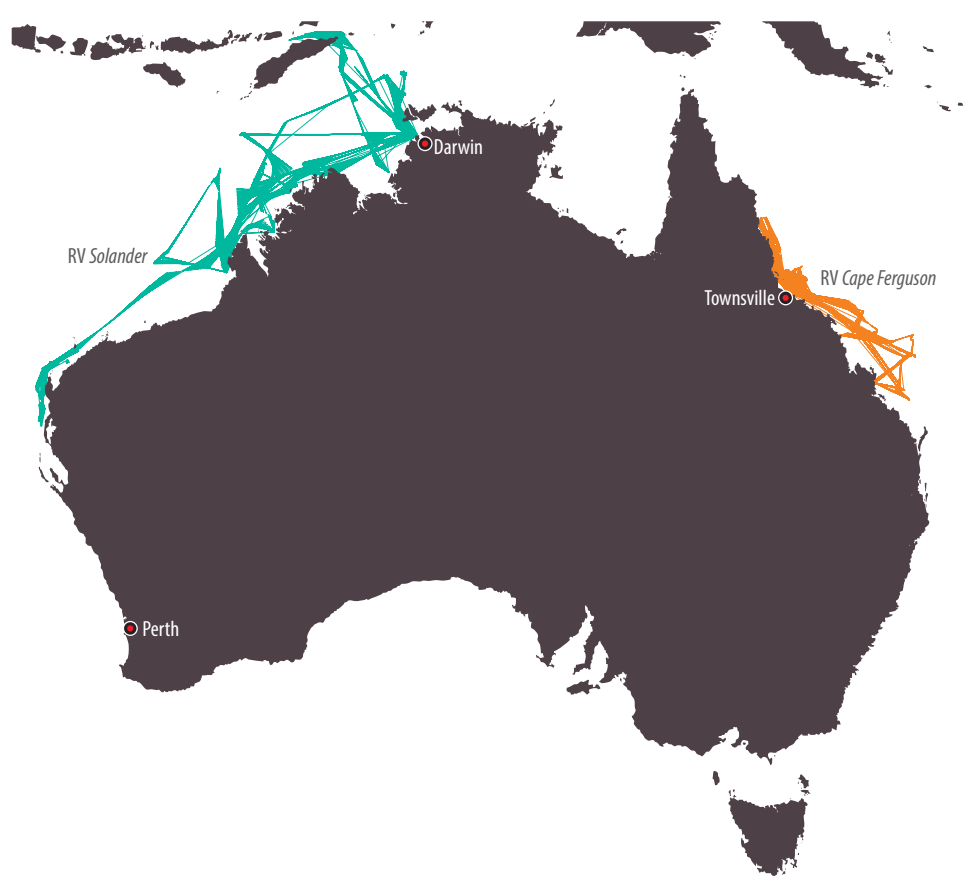


Figure 10: Activities of the major research vessels

Revenue

AIMS' operations were supported by a mix of Australian Government appropriation funding and non-appropriation funding from state and territory governments, competitive research funds, environmental regulators and the private sector.

AIMS' total revenue for 2015–16 was \$58.572 million, representing a decrease of 5.9 per cent on 2014–15 revenue (see Figure 11). The \$3.726 million decrease was mainly due to reduction in external funding (\$1.072 million) and reduction in other revenue (\$0.798 million).

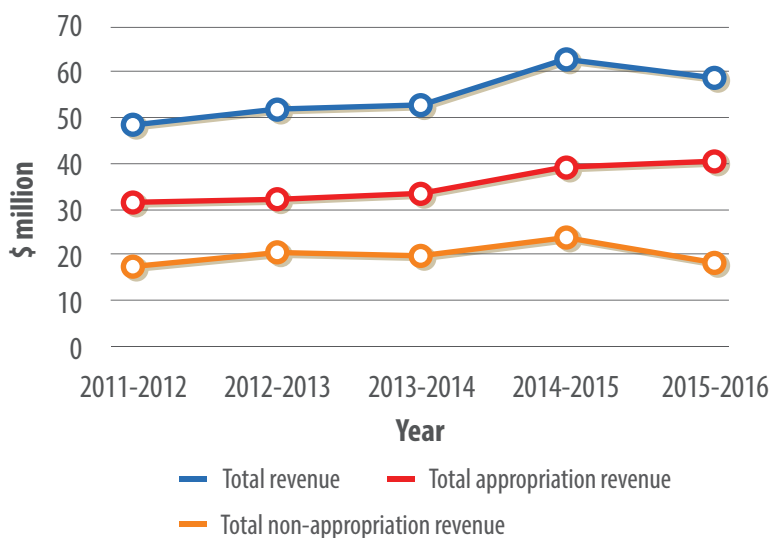


Figure 11: AIMS' revenue over time

External revenue

External funding is critical for AIMS to maintain its present level of scientific research. In 2015–16, revenue from external sources was \$16.324 million, which accounted for 28 per cent of AIMS' total revenue (see Figure 12).

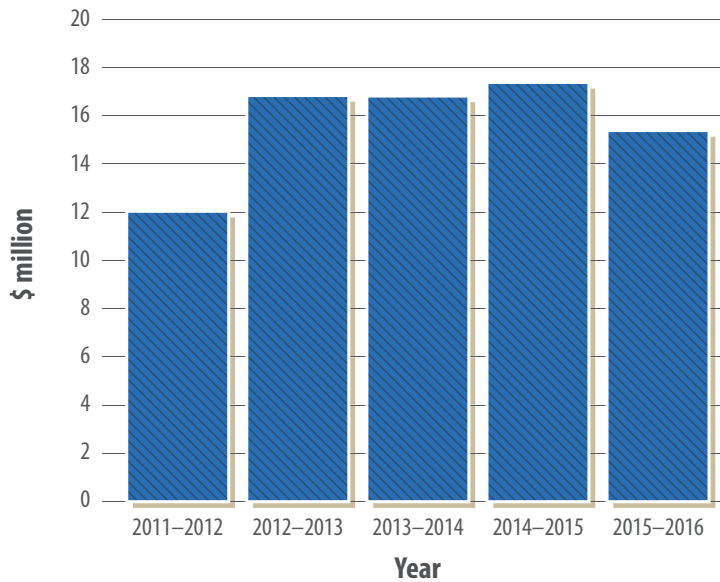


Figure 12: Total external revenue earned by AIMS during the last five financial years

Sources of co-investment funding for 2015–16

Australian Government departments and agencies and Australian industry partners together provide 79 per cent of AIMS' total external revenue (that is, funds earned on top of AIMS' appropriation allocation) through major grants and project contracts (see Figure 13).

See Financial statements (starting on page 95) for detailed information on financial performance.

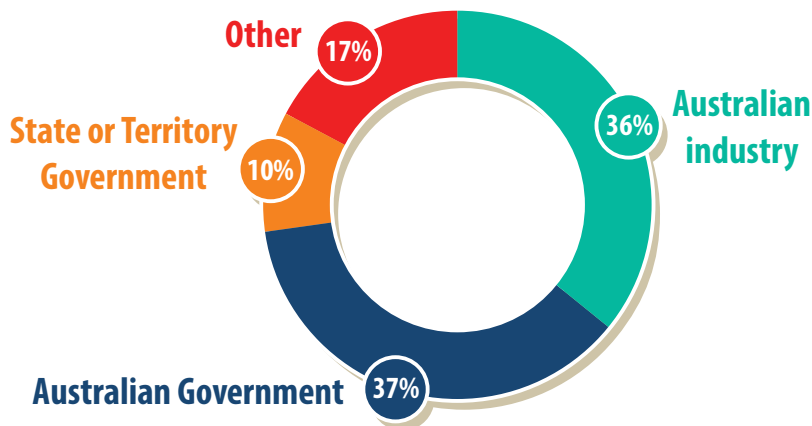


Figure 13: Major sources of external revenue in 2015–16



Complex environmental systems can be simulated in the equally-complex SeaSim. Image: Christian Miller

Our organisation

Management and accountability

The Australian Institute of Marine Science (AIMS) has in place a comprehensive system of corporate governance practices that provide control, disclosure and accountability of its activities.

Role and legislation

AIMS was established by the *Australian Institute of Marine Science Act 1972* (AIMS Act) and is a corporate Commonwealth entity under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

The Institute's functions and powers are set out in ss. 9 and 10 of the AIMS Act (see Appendix 3 on page 155). AIMS has two main roles under its governing legislation. They are to:

- carry out research and development in relation to –
 - marine science and marine technology
 - the application and use of marine science and marine technology
- encourage and facilitate the non-commercial and commercial application of the results arising from such activities.

The PGPA Act sets out reporting, accountability and other requirements relating to AIMS' operations, management and governance. Section 39 of the PGPA Act requires corporate Commonwealth entities to prepare annual performance statements and to include them in an annual report to the Australian Parliament. Schedule 1, subdivision B, s. 17BE of the Public Governance, Performance and Accountability Amendment (Corporate Commonwealth Entity Annual Reporting) Rule 2016, sets out the requirements for annual reports produced in accordance with s. 46 of the PGPA Act. An index of annual report requirements (see page 163) provides details of how this annual report meets those requirements.



Responsible minister

For the reporting period of this annual report (1 July 2015 to 30 June 2016), AIMS' responsible ministers were the Hon. Ian Macfarlane, MP, Minister for Industry and Science (1 July 2015 to 21 September 2015) followed by the Hon. Christopher Pyne, MP, Minister for Industry, Innovation and Science (21 September 2015 to 30 June 2016).

The Hon. Karen Andrews, MP, Parliamentary Secretary to the Minister for Industry and Science (1 July 2015 to 21 September 2015) and then Assistant Minister for Science (21 September 2015 to 30 June, 2016) supported the Minister in this role.



The Hon. Christopher Pyne, MP, Minister for Industry, Innovation and Science

Ministerial directions and statutory requirements

Minister Macfarlane provided the AIMS Council with a Statement of Expectations on 4 June 2015. This Statement outlines the Minister's expectations regarding the quality and focus of AIMS' research, its contribution to Australian Government priorities and initiatives, and AIMS' governance and communication responsibilities.

On 20 August 2015, AIMS Council Chairman the Hon. Penelope Wensley AC responded with AIMS' Statement of Intent. The Statement of Intent, which is published on the AIMS website, expresses AIMS' commitment to the Industry Innovation and Competitiveness Agenda and outlines how its *Strategic Plan 2015–25* (released earlier in 2015) corresponds strongly with the government's agenda and contributes to the government's Science and Research Priorities.

This annual report summarises AIMS' achievements against the Statement of Expectations and the alignment of AIMS' activities against the Science and Research Priorities.

General policies of the Australian Government

Under s. 22 of the PGPA Act, the Finance Minister may make a government policy order that specifies a policy of the Australian Government that is to apply in relation to one or more corporate Commonwealth entities.

Government policy orders that applied to AIMS under the reporting period are the:

- Commonwealth Fraud Control Policy
- Australian Government Foreign Exchange Risk Management Guidelines
- Commonwealth Procurement Rules.

AIMS participated in consultation processes relating to arrangements for engagement between Commonwealth bodies and the Parliamentary Budget Office and the Australian Government's Protective Service Policy Framework. These processes, which may lead to the making of general policy orders, were ongoing as of 30 June 2016.

AIMS did not form, or participate in the formation of, any new companies, trusts or partnerships.

In accordance with Senate Standing Order 25 (20), AIMS' *Annual Report 2014–15* was submitted to the Senate Economics Legislation Committee for review. In its document *Annual Reports (No. 1 of 2016)*, dated 2 March 2016, the committee confirmed that AIMS's annual report was prepared in accordance with reporting obligations set out in the AIMS Act and the provisional arrangements contained in PGPA (Consequential and Transitional Provisions) Rule which stipulate that, for the 2014–15 period, annual reports be prepared in accordance with the *Commonwealth Authorities and Companies Act 1997* (CAC Act) and, in particular, Part 2 of the Finance Minister's *Commonwealth Authorities (Annual Reporting) Orders 2011*. The Committee commended AIMS for a well-presented, comprehensive and accessible report.

Corporate governance

AIMS is governed by a Council that reports to the relevant Minister. The CEO is responsible for the day-to-day affairs of the Institute.

Role of Council

The AIMS Council sets AIMS' key objectives and research strategies, and oversees AIMS' management. The Council advises the Minister and the Department of Industry, Innovation and Science of AIMS' progress against its research plans. The Minister is also provided with advice on developments of significance, as appropriate.

The PGPA Act requires the AIMS Council, as the 'accountable authority' of AIMS, to comply with the following specific duties:

- the duty to govern the Commonwealth entity
- the duty to establish and maintain systems relating to risk and control
- the duty to encourage cooperation with others
- the duty in relation to requirements imposed on others
- the duty to keep the responsible Minister and the Finance Minister informed.

Council members

The AIMS Council consists of a Chairman, AIMS' CEO, a member nominated by James Cook University (JCU), and four other members. The AIMS Act requires that at least three members of Council have scientific qualifications. All members of Council, with the exception of the CEO, are non-executive appointments made by the Governor-General on the nomination of the Minister. Appointments can be up to five years and re-appointment is permissible. The CEO is appointed by the Council for a period not exceeding five years and is eligible for re-appointment.

Current Council



AIMS Council: Dr Stephen Morton, Ms Diana Hoff, Dr Brian Fisher AO PSM, The Hon Penelope Wensley AC (Chairman), Mr John Gunn (CEO), Mr Roy Peterson, Professor Sandra Harding. Image: K. McAllister (AIMS)

The Honourable Penelope Wensley AC

Council Chairman: 01 January, 2015 – 31 December, 2019

Penny Wensley served as the 25th Governor of Queensland 2008–14. Her appointment as Governor followed a long and distinguished career as a career diplomat, representing Australia in a wide range of overseas postings and senior policy positions in Canberra. Born in Toowoomba, and graduating from the University of Queensland (UQ) (BA 1st Class Hons 1967), Ms Wensley joined the then Department of External Affairs in 1968. Her first posting was to France, followed by Mexico, and New Zealand. Her first Head of Mission appointment was as Consul-General, Hong Kong. Subsequent ambassadorial appointments included Ambassador to the United Nations (UN), Geneva, Ambassador for the Environment, Ambassador to the UN, New York, High Commissioner to India and Ambassador to France.

Ms Wensley has achieved national and international recognition for her contribution to the UN. She played a key role in the negotiation of several major international treaties, including the UN Framework Convention on Climate Change and the UN Convention to Combat Drought and Desertification. She chaired or co-chaired a number of major UN conferences and processes, including the First UN Special Session on HIV/AIDS, the UN Conference on the Sustainable Development of Small Island Developing States, and the UN Budget and Finance Committee. She also helped launch the International Coral Reef Initiative.

Ms Wensley was made an Officer of the Order of Australia (AO) in 2001, a Grand Officer of the Order of Merit of France in 2009, and a Companion of the Order of Australia (AC) in 2011. She has been awarded Honorary Doctorates by the University of Queensland (1994), Griffith University (2008), the Queensland University of Technology (2011) and James Cook University (2013). She is a Fellow of the Australian Institute of International Affairs and an Honorary Fellow of the Environment Institute of Australia and New Zealand.

Ms Wensley accepted appointment as Chairman of the Reef 2050 Advisory Committee, one of the principal mechanisms established by the current Queensland government to support implementation of the *Reef 2050 Long-Term Sustainability Plan* for the protection and management of the GBR.

Professor Sandra Harding, BSc (Hons), MPubAdmin, PhD, Hon Doc JIU, FACE, FQA, FAICD, FAIM

Council Member: 10 May, 2007 – 27 May 2020

Sandra Harding represents James Cook University on the AIMS Council, and maintains links with the wider education sector. As Vice-Chancellor and President of the University since 2007, she is responsible for ensuring clear and effective leadership and management across all operating sites, including campuses in Townsville, Cairns and Singapore. Professor Harding has extensive academic and academic leadership experience. An economic sociologist by training, her areas of enduring academic interest include work, organisation and markets and how they work. She also has a keen interest in public policy in two key areas: education policy and related areas; and, the global tropics, northern Australia and economic development.

Professor Harding has undertaken a wide variety of external roles within the business community and the higher education sector. Current roles include: Project Convener, State of the Tropics project; Commissioner, Australian Centre for International Agricultural Research; Director, Australian American Education Leadership Foundation; Director, Westpac Bicentennial Foundation Board; Councillor, Queensland Futures Institute; Member, Trade and Investment Policy Advisory Committee; Member, the Australia–China Council Board; Co-Vice Chair, the New Colombo Plan Reference Group; Director, Regional Australia Institute; Director, North Queensland Cowboys NRL club; Director, Townsville Enterprise; Director, Advance Cairns; and, Governor, Committee for Economic Development of Australia.

Dr Brian Fisher AO, PSM, BScAgr (Hons), PhD, DScAgr (*honoris causa*), FASSA

Council Member: 26 September 2007 – 25 March 2017

Brian Fisher is a practised director and board member with wide experience in agricultural science and economics.

He has been Executive Director of the Australian Bureau of Agricultural and Resource Economics, Vice-President at CRA International and CEO of Concept Economics. He is Chairman and Managing Director of economic consulting firm BAEconomics Pty Ltd. Dr Fisher was previously Professor of Agricultural Economics and Dean of Agriculture and Adjunct Professor of Sustainable Resources Development at the University of Sydney. He has published over 280 articles and monographs. He has been an Associate Commissioner of the Productivity Commission and Chairman of the Prime Minister's Exports and Infrastructure Taskforce in 2005. He served as a member of the expert panel on renewable energy in 2014. Dr Fisher served as convening lead author or lead author in Working Group III of the UN Intergovernmental Panel on Climate Change (IPCC) for their 2nd, 3rd and 4th assessment reports.

Dr Fisher received the Farrer Memorial Medal for agricultural science in 1994, became a Fellow of the Academy of Social Sciences in Australia in 1995, was awarded the Public Service Medal in 2002, became a Distinguished Fellow of the Australian Agricultural and Resource Economics Society and received an Order of Australia in 2007. He holds a PhD in agricultural economics and a DScAgr (*honoris causa*) from the University of Sydney.

Ms Diana Hoff, BSc Petroleum Engineering

Council Member: 16 December 2014 – 15 December 2019

Ms Diana Hoff is an executive in the oil and gas industry with more than 25 years of experience with major and independent companies, including Santos, Chevron and Amoco. She is currently the CEO for The Unconventional Group which advises energy companies in Australasia, the United Kingdom and North America. Ms. Hoff has held senior leadership and technical roles in Australia and the United States across offshore and onshore projects in both countries, as well as Indonesia, Vietnam and Bangladesh. Over her career, Ms Hoff has had responsibility for drilling and completions engineering and operations, production and facilities engineering, major projects, and safety and environment.

Ms Hoff holds a Bachelor of Science, Petroleum Engineering (*magna cum laude*) from Marietta College, Ohio, United States of America. Her career has included engineering and management, with a significant focus on performance improvement and regulatory processes, including environmental approvals, stakeholder engagement and mitigations to lessen impacts to air quality, water quality and surface disturbance.

Dr Stephen Morton, BSc (Hons), PhD, GAICD

Council Member: 16 December 2014 – 15 December 2019

Dr Stephen Morton has extensive expertise in conservation, land management and ecological sustainability. He is currently an Honorary Fellow with CSIRO Land and Water. Dr Morton holds a Bachelor of Science (Honours) and a Doctor of Philosophy in animal ecology, both from the University of Melbourne, and has published more than 150 scientific articles, book chapters, books, refereed reports and popular articles.

In the final decade of his career at CSIRO, he held senior positions as Chief of CSIRO Sustainable Ecosystems and then as Group Executive for Environment and Natural Resources (with responsibility for marine science), for Energy and Environment, and for Manufacturing, Materials and Minerals. In the latter role, Dr Morton oversaw the development of long-term, multi million dollar research and development alliances with General Electric, Orica and BHP Billiton.

Since leaving CSIRO in 2011, Dr Morton has worked as an independent consultant and has taken on several advisory roles, including Chair of the Scientific Advisory Panel to the Lake Eyre Basin Ministerial Forum (Canberra, ACT), Deputy Chair of Territory Natural Resource Management (Darwin, NT), Chair of the Arid Recovery Advisory Board (Roxby Downs, SA), member of the Board of the Western Australian Biodiversity Science Institute (Perth, WA), and member of the GBR Water Quality Taskforce for the Queensland Government (Brisbane, Qld).

Mr Roy Peterson, BCom, FCA, FTI

Council member: 11 December, 2014 – 10 December, 2019

Roy Peterson holds a Bachelor of Commerce degree from the University of Queensland. He is a chartered accountant with strong governance and audit committee experience, including internal audit, risk management, process improvement and taxation. Mr Peterson has worked in audit and finance positions for more than 32 years, including 26 years as a Partner with PricewaterhouseCoopers (PwC).

Mr Peterson is currently the Chairman of the AIMS Audit Committee. He is a member of a number of audit and finance committees, government bodies and not-for-profit organisations, has chaired the North Queensland committee for the Australian Institute of Company Directors (AICD), and was a member of the Taxation Institute National Taxation Liaison committee. He is a Fellow of the Institute of Chartered Accountants and a Fellow of the Taxation Institute of Australia.

Mr John Gunn, BSc (Hons), FTSE, MAICD

Council member: 28 November, 2011 – 27 November, 2016

John Gunn is the CEO of AIMS. Mr Gunn has significant experience in leading development of strategy, scientific research and capability, and stakeholder engagement across a research portfolio encompassing marine ecology, fisheries, coastal systems, physical and chemical oceanography, atmospheric chemistry and climate science. Mr Gunn joined AIMS from the position of Chief Scientist of the Australian Antarctic Program, where he played a key role in developing the *Australian Antarctic Science Strategy Plan: 2011–2021*. Prior to this, he was Deputy Chief of CSIRO's Marine and Atmospheric Research Division.

Mr Gunn has broad experience on high-level advisory and policy development boards and advisory committees, including the UNESCO–IOC Global Ocean Observing System Steering Committee, the National Marine Science Committee, and Australia's Integrated Marine Observing System Board.

Alongside his executive experience, Mr Gunn has an extensive academic record. He has authored over 150 peer-reviewed publications, articles and technical reports, and presented at more than 100 conferences and symposiums, in many instances as the keynote speaker. He has an international reputation in pelagic fish ecology and in the development of marine biology observation technology and systems.

Education and performance review processes for Council members

Council members are provided at their induction with a comprehensive set of documents, including: the AIMS *Code of Conduct*; the Australian Government's *Corporate Governance Handbook for Company Directors and Committee Members*; the PGPA Act; the AIMS *Corporate Plan*, *Research Plan*, *Business Continuity Plan*, *Enterprise Agreement* and *Fraud Control Plan*; *AIMS Strategic Directions*; and the AIMS Act.

Council members are encouraged to maintain their membership with the AICD.

Council members' performance is reviewed regularly, alternately by the Chair and by an external reviewer.

Ethics

Council members are briefed and required to sign the AIMS *Code of Conduct*. Council members must also abide by the *Code of Conduct for Directors* published by the AICD.

Disclosure of interest

Section 29 of the PGPA Act provides for the disclosure of material personal interests in a matter that is being considered by the Council, and prohibits participation, deliberation and decision-making by any member on such matters, unless so resolved by the Council or entitled by the Minister. Details of such disclosure are recorded in the minutes of the meeting. All of these requirements are currently being met.

Council attendance

Attendance	28 August 2015 (telecon)	10-11 September 2015	7-8 December 2015	31 March – 1 April 2016	20-21 June 2016
The Hon. Penelope Wensley AC	Yes	Yes	Yes	Yes	Yes
Professor Sandra Harding	Yes	Yes	Yes	Yes	Yes
Dr Brian Fisher AO	Yes	Yes	Yes	Yes	Yes
Dr Stephen Morton	Yes	Yes	Yes	Yes	Yes
Ms Diana Hoff	Yes	Yes	Yes	Yes	Yes
Mr Roy Peterson	Yes	Yes	Yes	Yes	Yes
Mr John Gunn	Yes	Yes	Yes	Yes	Yes

Audit Committee

The Audit Committee is a formal subcommittee of the Council that meets quarterly. The 2015–16 Audit Committee members were:

- Mr Roy Peterson (Council member and Committee Chair)
- Ms Diana Hoff (member)
- Ms Margaret Walker (independent member).

The AIMS CEO, Chief Operating Officer (COO) and Chief Finance Officer (CFO), representatives of the Australian National Audit Office (ANAO), and an internal auditor, attend all meetings, or relevant parts of all meetings, by invitation.

In accordance with best practice, all Council members receive copies of Audit Committee agendas and meeting minutes, and can attend meetings as a right.

The Audit Committee is responsible for providing independent assurance and assistance to Council on:

- financial reporting
- performance reporting
- systems of risk oversight and management
- systems of internal control
- internal audit
- external audit.

Four full meetings of the committee were held during 2015–16.

Audit Committee attendance

Attendance	10 August 2015	16 November 2015	29 February 2016	6 June 2016
Members				
Mr Roy Peterson (Chair)	Yes	Yes	Yes	Yes
Ms Diana Hoff (Council member)	Yes	Yes	Yes	Yes
Ms Margaret Walker (independent member)	Yes	Yes	Yes	Yes
Invitees				
Mr John Gunn (AIMS CEO)—AIMS management representative	Yes	Yes	Yes	No
Mr David Mead (AIMS COO)—representing John Gunn	Yes	Yes	Yes	No
Mr Vic Bayer (AIMS CFO to February 2016)	Yes	Yes	N/A	N/A
Mr Basil Ahyick (AIMS CFO from February 2016)	N/A	N/A	Yes	Yes
Ms Pamela Giese (AIMS Finance Team Leader)	Yes	Yes	Yes	Yes
Mr Chris King (HLB Mann Judd internal auditor to August 2015)	Yes	N/A	N/A	N/A
Mr Josh Chalmers (PwC, internal auditor from September 2015)	N/A	Yes	Yes	Yes
Ms Serena Buchanan (ANAO)	No	No	No	No
Mr John Zabala (Moore Stephens, ANAO External Auditor)	Yes	No	Yes	Yes

Independent professional advice

The Council has the right to obtain, at AIMS' expense, relevant independent professional advice in connection with the discharge of its responsibilities. They did not seek such advice in 2015–16.

Fraud control

AIMS remains committed to mitigating incidences of fraud and managing risks. AIMS has developed a *Fraud Control Plan* using the *Commonwealth Fraud Control Framework 2014* and in adherence to s. 10 of the PGPA Rule 2014. AIMS has also reported its 2015–16 fraud data to the Australian Institute of Criminology.

On 9 July 2015 AIMS informed the Australian Federal Police (AFP) of a suspected financial fraud by an AIMS official. The AFP together with AIMS completed an investigation which resulted in the AFP charging and arresting an employee whose employment was also terminated. This matter is now before the Courts. As part of, and subsequent to, the investigation, AIMS reviewed its internal controls around this incident, its financial control framework in general and whether there had been any research fraud related to the incident.

The investigation and reviews are ongoing. This statement is made in adherence with ss. 17BE (h) and (i) of the PGPA Rule.

Financial reporting

AIMS' financial statements are prepared in accordance with:

- Division 4 of the PGPA Act and s. 17(2) (a) of the PGPA (Financial Reporting) Rule 2015 (FRR) for the reporting period
- the Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Board that apply for the reporting period effective from 1 July 2015.

The financial statements are accompanied by a signed statement by the directors, CEO and CFO, declaring that the statements comply with the accounting standards and any other requirements prescribed by the FRR and present fairly the entity's financial position, financial performance and cash flows in accordance with s. 42 of the PGPA Act.

There were no related entity transactions during financial years 2014–15 or 2015–16.

Performance reporting

Section 39 of the PGPA Act requires an annual performance statement to be provided by corporate Commonwealth entities from 2015–16. AIMS' annual performance statement for 2015–16 starts on page 13 of this report.

Systems of risk oversight and management

Under s. 17(2) (c) of the PGPA Rule, the Audit Committee is responsible for reviewing AIMS' risk framework (and monitoring management's compliance with that framework) and making recommendations to Council to address any significant issues raised.

System of internal audit control

The Audit Committee's responsibilities include reviewing the Audit Plan and all the internal audit reports, and making recommendations to Council and management to address any significant issues raised. The committee also reviewed whether the internal audit coverage aligned with AIMS' key risks. The internal audit function was performed by PwC during the year. The internal auditor is responsible for independently reviewing risk in accordance with the *AIMS Corporate Plan*.

External audit

Under s. 43 of the PGPA Act, the Commonwealth Auditor-General, through the ANAO, is the external auditor for AIMS. The Audit Committee reviewed the ANAO Audit Plan and reported to, and met with, ANAO representatives prior to recommending to the Council that the annual financial statements be accepted and the Statement by Council be signed.

Risk management

AIMS has a comprehensive corporate risk management strategy which includes processes to identify and assess new risks to AIMS, and to refine existing control measures.

Operational risk management is established across the Institute, with processes, procedures and systems of work in place to manage workplace health and safety risks that may affect AIMS workers. AIMS participates in the annual Comcover risk management benchmarking survey, and in 2014–15 revised its risk management policy and framework in line with the PGPA Act, and findings of an independent review that was completed in 2013–14.

Investing and financing activities

AIMS invested its surplus money in accordance with s. 59 of the PGPA Act and AIMS' policy on investments.

Indemnities and insurance premiums for officers

There were no liabilities to any current or former officials of AIMS during the reporting period. No premium was paid (or was agreed to be paid) against a current or former official's liability for legal costs. AIMS paid premiums for directors' and officers' insurances, as required.

Compliance

AIMS conducted its affairs in accordance with the requirements of all applicable laws and regulations, including the PGPA Act and prescribed rules, the applicable policies of the Australian Government, and the internal policies of AIMS. Any government policy orders notified as being applicable to AIMS were duly complied with (s. 22(3), PGPA Act).

Duty to inform and Ministerial notifications

The AIMS Council is required to notify the responsible Minister of any significant issue that has affected AIMS (s. 19(1) (e), PGPA Act). On 6 September 2015, and subsequently, AIMS notified the responsible Minister of the suspected financial fraud as noted under the heading 'Fraud control' in this report (see page 81).

Consultancy services

AIMS engages individuals and companies as external consultants from time to time where it lacks specialist expertise, or when independent research, review or assessment is required.

Consultants are engaged to: investigate or diagnose a defined issue or problem; carry out defined reviews or evaluations; or, provide independent advice, information or creative solutions to assist in AIMS' decision-making.

Decisions to engage consultants take into consideration the skills and resources required for the task, the skills and/or resources available internally and the cost-effectiveness of these options. Engagement of a consultant is made in accordance with AIMS' Procurement Policy and Procedures and other relevant internal policies.

AIMS spent \$19 000 (excluding GST) on consultancies during 2015–16.

Public accountability

Judicial decisions and reviews by outside bodies

No judicial decisions relating to AIMS were handed down during the reporting period.

Ombudsman

No issues relating to AIMS were referred to the Commonwealth Ombudsman during the 2015–16 reporting period other than the annual report in respect of the 2014–15 reporting period and AIMS' submissions to the public enquiry into the *Public Interest Disclosure Act 2013*.

Industrial relations

No significant industrial relations issues arose during the reporting period other than the negotiation of AIMS' Enterprise Agreement 2015–18.

Customer service charter

AIMS has a formal service charter for dealing with clients, a copy of which is posted on the website. AIMS welcomes feedback on how well it is delivering services against the standards set in this charter. Both the charter and details about how to provide feedback may be found at www.aims.gov.au/docs/about/corporate/service-charter.html.

Parliamentary committees

No reports were produced on the operations of AIMS by a parliamentary committee during 2015–16.

Privacy Act 1988

To ensure the proper management, administration and safety of its officers, employees, visitors, volunteers and contractors, AIMS is required to collect personal, and occasionally sensitive, information. AIMS is committed to the Australian Privacy Principles contained within the *Privacy Act 1988* and has formal processes to manage privacy, as detailed in the AIMS Privacy Policy and Procedures. AIMS has a Privacy Officer (privacy@aims.gov.au) who is responsible for ensuring that AIMS' Privacy Policy and Procedures are adhered to and comply with all applicable statutory requirements.

Freedom of information requests, reviews, decisions and statements

Two requests for documents under the provisions of the *Freedom of Information Act 1982* (FOI Act) were received by AIMS during 2015–16, and both were duly complied with.

In addition, no applications were received during 2015–16:

- for internal review of decisions made under the FOI Act
- for external review by the Administrative Appeals Tribunal of decisions made under the FOI Act
- to amend any records under the FOI Act.

FOI operations

Agencies subject to the FOI Act are required to make information available to the public as part of the Information Publication Scheme (IPS). This requirement is in Part II of the FOI Act and has replaced the former requirement to publish a s. 8 statement in the annual report. Each agency must display on its website a plan showing what information it publishes in accordance with the IPS requirements.

The documents listed in AIMS' IPS Agency Plan are generally freely available to any person requesting them. The availability of other information is subject to assessment which is made on a case-by-case basis in accordance with the relevant provisions in the FOI Act as supplemented and explained in the relevant fact sheets, guidelines and other materials published on the website of the Office of the Australian Information Commissioner (www.oaic.gov.au/freedom-of-information/foi-resources/all/). The grounds for assessment include considerations of commercial confidentiality, legal professional privilege and personal privacy. The FOI Act and the above website explain these, the other unconditional exemptions and the conditional exemptions contained in the current legislation.

Requests for any such information from AIMS must be made in writing, addressed to the relevant person, and must contain the information set out under 'How do I make an FOI request?' in FOI Fact Sheet 6 *Freedom of information—How to apply* on the above website. The request should be addressed to the FOI Officer at the address given below. There is no fee payable for the request. However, fees and charges may apply and if they do, will be set in accordance with Part 4 of the FOI Guidelines which are available from the FOI website.

Information publication scheme

AIMS continues to undertake actions consistent with compliance requirements under the IPS introduced in May 2011 pursuant to the relevant provisions in the FOI Act. The IPS encourages governments and government agencies to provide open, accountable and transparent information in formats that are easy to understand and freely accessible.

Contact

All enquiries and requests for information, or concerning access to documents or any other matters relating to FOI, should be directed to:

FOI Officer
Australian Institute of Marine Science
PMB No 3, Townsville Mail Centre MC, Qld 4810
Telephone: (07) 4753 4444
Facsimile: (07) 4772 5852
Email: privacy@aims.gov.au

Health and safety

AIMS understands its responsibilities under Part 2 of the *Work, Health and Safety Act 2011*, and is committed to complying with work health and safety legislation and standards of best practice (Australian Standards and national and other relevant codes of practice) and the ongoing implementation of the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* and National Standards for Commercial Vessels.

AIMS is committed to protecting the health and safety of its workers and other persons against harm to their health, safety and welfare by eliminating or minimising risks arising from work. AIMS recognises the importance of providing a safe work environment, and a robust and accessible health and safety management system and fostering a culture focused on awareness, open communication, safety education and supervision, risk management and safe working methods.

AIMS use active communication and consultation processes to involve its workforce in safety discussions and decision-making processes. Workers are engaged and have input through safety meetings, targeted working groups, safety briefings, proactive hazard identification and incident reporting. AIMS workers belong to working groups represented by staff-appointed Health and Safety Representatives (HSRs) who participate in routine Safety Committee meetings, audit and inspection routines and incident reporting notifications.

Hazards are identified and risks assessed in line with AIMS' Risk Management Framework and established operational risk management practices, allowing effective management of the complexities of the research work, activities and necessary supporting functions. The Institute fosters a reporting culture to ensure that all personnel feel able to delay or stop work where an unacceptable risk may be present or develop, and report hazards or incidents identified.

AIMS hold that 'safe science is good science' and that safety is a shared value embedded in everything we do. Management is committed to understanding and managing our health and safety risk profile, and dedicates significant resources towards continual improvement projects and strategies.

AIMS' Strategic Work Health and Safety Pillars include:

- leadership
- policy and procedure
- risk management
- reporting and investigation
- training and communication
- health and wellbeing.

Our commitment to the ongoing health and safety of all of our workers is demonstrated by the number and diversity of roles, resources and training dedicated to health and safety management at AIMS. Roles include:

- three dedicated Health and Safety Officers
- eight HSRs and a Safety Committee
- Chief and Deputy Chief Emergency Wardens, Fire and Deputy Fire Wardens
- Diving Officer (safety focus)
- Boating Officer (safety focus)
- Laboratory Operations Manager and dedicated Laboratory Managers
- staff with advanced medical care training
- staff with first aid qualifications (a high percentage)
- contracted emergency response and first aid providers
- Harassment Contact Officers
- Quarantine Officer (statutory position)
- Radiation Safety Officer (statutory position)
- Biosafety Officer (statutory position)
- Fire Safety Adviser (statutory position)
- Return-to-Work and Rehabilitation Officer.

Recent training provided includes:

- Operational Risk Management
- Participative Ergonomics For Manual Tasks program (PErform)
- general manual task training
- crane operations
- working at height
- elevated work platform operations
- first aid and advanced resuscitation
- elements of shipboard safety
- coxswains training and assessment
- rescue diver
- ADAS commercial diving accreditation
- site-specific inductions.

Continuous improvement

In 2015–16 AIMS continued to focus on manual task injury prevention. Manual task training, sit-stand work station trials and PErforM (Participative Ergonomics for Manual Tasks) training was provided to staff to help improve physical aspects of workplace layout; improve ergonomics; and eliminate or control hazardous manual tasks.

Updated operational risk management systems have been rolled out to all staff. Relevant training, along with the implementation of 'Take AIM'—an informal program designed to encourage staff to use the new systems—are helping to ensure adoption of formal risk management practices. Other focus areas included the commissioning of a learning management system and commissioning and rollout of a new safety reporting system.

Completion of system audits

AIMS completed all planned system audits scheduled for 2015–16, including internal audits of our safety management systems against AS/NZ 4801:2001 Occupational Health and Safety Management Systems. The Institute achieved 100 per cent compliance with the AIMS Workplace Inspection Schedule—an internal system that ensures the provision of a safe workplaces throughout AIMS.

Incidents and hazard reporting

During 2015–16, 170 potential safety matters, of which 78 per cent were hazards, were formally recorded in our incident management system. Appropriate preventative actions were implemented, demonstrating a commitment to continuously improve safety at AIMS.

The number of total and recordable injuries (lost time injury, medical treatment case, lost work case) has remained constant with 5 recordable injuries and 12 total injuries in 2015–16, compared to 6 recordable injuries and 12 total injuries in 2014–15.

No incidents were notified to Comcare, the workplace health and safety regulator, under the requirements of Part 3, ss. 36 and 37 of the *Work Health and Safety Act 2011*, in relation to serious injury or illness and dangerous incident.

No new workers' compensation claims were made under the Comcare Workers' Compensation Scheme.

Environmental performance

AIMS demonstrates an extensive commitment to environmental protection and biodiversity conservation. The Institute has worked with industry, government, the community and other scientific institutions and agencies on programs and projects dedicated to conserving and sustainably managing tropical marine resources. As a community leader in tropical Australia and a Commonwealth statutory authority, AIMS has both a moral obligation and a statutory obligation, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to protect and maintain the biodiversity and heritage under its control.

In addition to our many activities contributing to environmental protection and biodiversity conservation, we are committed to minimising any adverse effects on the environment arising from our own activities.

Reducing AIMS' environmental impacts

A new off-peak chilled water plant at the Cape Ferguson site was completed in 2015–16. The system has delivered a 40 per cent reduction in energy consumption associated with air-conditioning buildings and providing chilled water systems for the SeaSim. The thermal energy storage tank has shifted electrical demand for air-conditioning into off-peak periods, reducing the burden on electricity distribution infrastructure.

AIMS commissioned a 65 kW photovoltaic solar system at the ATRF in Darwin, resulting in a 17 per cent reduction in electricity consumption at the site. AIMS has also completed a feasibility study for the installation of a 275 kW solar systems at the Townsville facility, which is planned for 2016–17.

As well as focusing on step-change improvements in electricity consumption, AIMS continues to promote energy efficiency among the workforce.

AIMS operates a car-pooling program whereby staff are provided with access to shared vehicles. Approximately 91 per cent of all staff, visitors and students travel to and from AIMS each day in a commuter vehicle. The vehicles AIMS selects for the commuter fleet must achieve a Green Vehicle Guide rating of 10.5 or higher. It is estimated that the commuter program reduces the number of vehicles travelling to and from AIMS each day by between 80 and 100.

Water usage

AIMS used 43.9 ML of water in 2015–16, a reduction from 64.1 ML the previous year. The reduction is due to completion of commissioning works associated with the off-peak chilled water plant.

Recycling

AIMS operates an active recycling program for paper, cardboard, batteries, printer cartridges, lubricants and metals. In 2015–16 we investigated options to recycle glass and plastic. Although there are no collection facilities available from our remote location, other methods can be implemented. These would incur an increase in the operational cost and are being considered further for potential implementation in 2016–17.

Energy usage

AIMS Cape Ferguson's site electricity consumption for 2015–16 was 8190 gigawatts for the year, compared with 8011 gigawatts in 2014–15. The minor increase in consumption was due to the warmer than average conditions throughout the year causing a higher cooling load to maintain environmental control for site buildings and experimental systems.

Radiation safety

AIMS continues to hold a source licence issued by the Australian Radiation Protection and Nuclear Safety Agency. This licence is subject to conditions, including quarterly reporting, maintaining a source inventory, and complying with relevant regulations, codes and standards.

Gene technology

No new proposals for dealing with genetically modified organisms (GMOs) were assessed by the AIMS Biosafety Committee this year. One licensed project defined by the Office of the Gene Technology Regulator as a 'dealing not involving release' (DNIR), four 'notifiable low risk dealings' (NLRDs), and two exempt dealings were completed. AIMS now has seven active GMO projects: one NLRD and six exempt.

Staff

Organisational structure

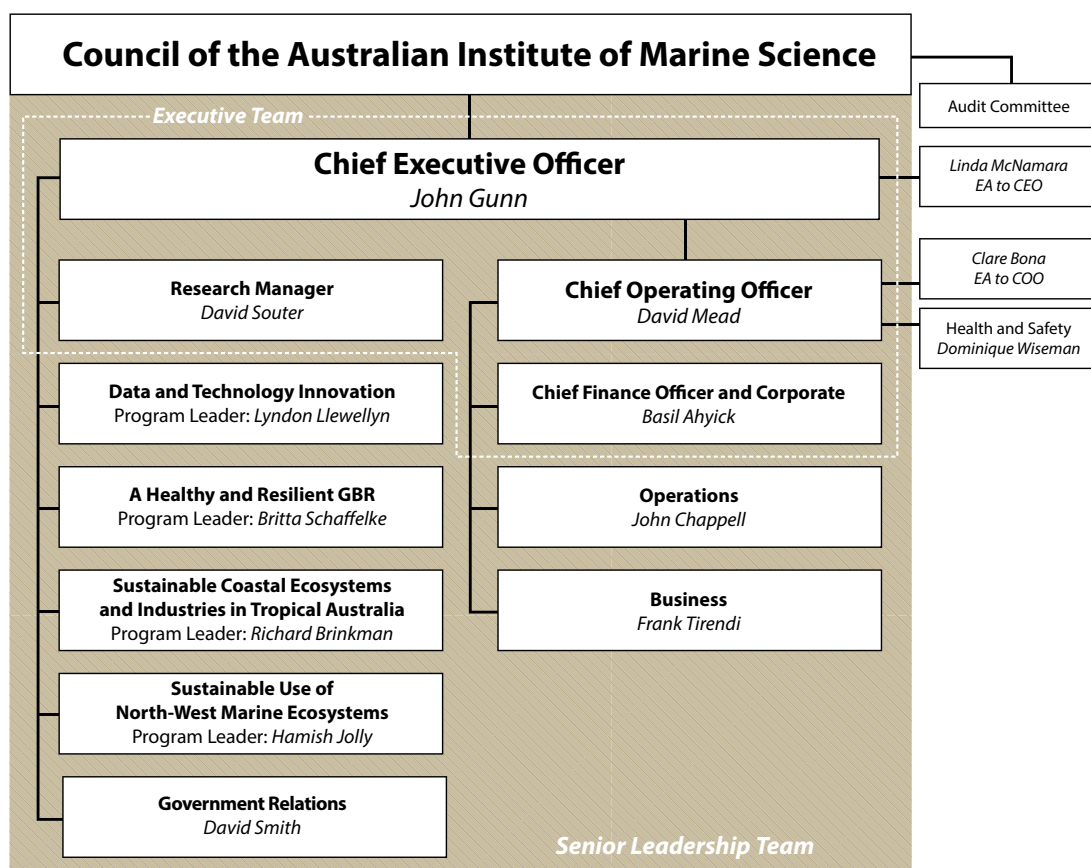


Figure 14: Organisational structure of the Australian Institute of Marine Science (as of June 2016)

Our people

AIMS employed an average core of 210 full-time equivalent (FTE) science and support staff during the 2015–16 financial year, including 7.9 FTE casuals and 9.0 FTE temporary staff. In addition, AIMS employed 42.0 FTE staff via outsourced functions (see Figure 15).

Many of our scientists are world authorities in their field who have achieved international acclaim for their research. The work of the research scientists is supported by a variety of professional support staff skilled in research, laboratory services, data collection and data management. Technical and corporate support staff deliver commercial services, intellectual property portfolio management, engineering services, field operations, information technology, information services, science communication, and financial, human resource, supply, facility and general management services. Where appropriate, AIMS contracts services; currently these include catering, cleaning, site maintenance, security and crewing marine research vessels.

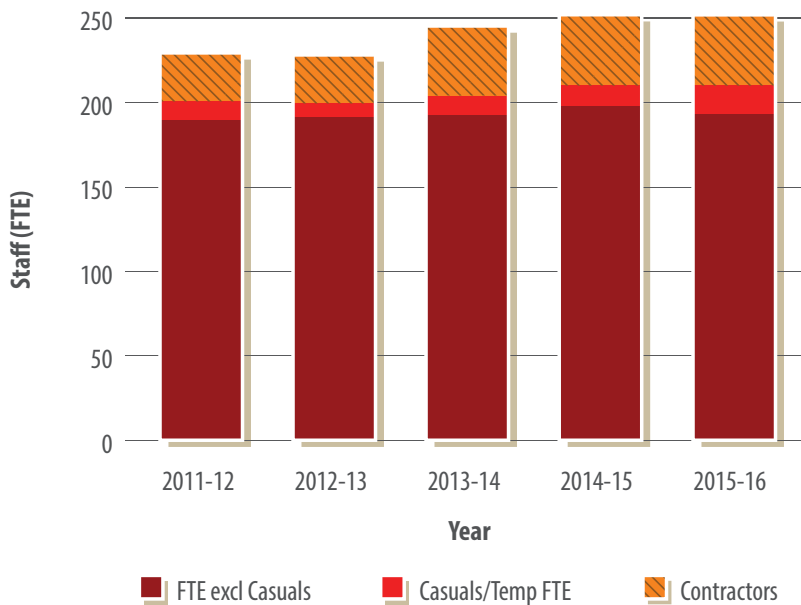


Figure 15: Total staff numbers

AIMS core staff numbers

Staff category	Number of staff (FTE)					
	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16
Total (excluding casual and temporary)	190	189	191	192	198	193
Casual and temporary	15	11	7	11	12	17
Total	205	200	198	203	210	210
Postdoctoral researchers (included in total)	(5)	(10)	(13)	(11)	(11)	(4)

Number of contractors engaged

AIMS outsources a number of functions via competitive tendering. The subcontracted companies employ approximately 40 FTE of staff dedicated to these functions.

Staff numbers by gender

Category	Number of core staff (FTE) 2015–16 (2014–15)		
	Female	Male	Total
Research scientists	19 (19)	28 (28)	47 (47)
Research support	23 (21)	45 (49)	68 (70)
Technical and corporate support	35 (35)	60 (58)	95 (93)
Total staff	77 (75)	133 (135)	210 (210)

Staff consultation

Staff consultation and communication take place via a range of mediums, such as all-staff meetings, emails and newsletters. The Joint Consultative Committee, comprising AIMS CEO (Chair), a management representative (COO), the Human Resources Manager, Community and Public Sector Union (CPSU) representatives (internal), a CPSU organiser (external), and a staff representative, met four times in 2015–16. This committee provides a forum for discussion and consultation between management and staff representatives on issues which may affect staff conditions and entitlements.

Equal employment opportunity and workplace diversity

AIMS' Workforce Diversity Policy acknowledges differences and adapts work practices to create an inclusive work environment in which diverse skills, perspectives and cultural backgrounds are valued.

AIMS' staffing policies and procedures align with the requirements of the *Equal Employment Opportunity (Commonwealth Authorities) Act 1987*. Designed to ensure that workplace diversity and equality of opportunity are fundamental operating principles for AIMS, they include:

- regularly reviewing employment policies and practices, and taking steps to implement ongoing instruction for user groups
- promoting AIMS as an equal opportunity employer in all recruitment advertisements placed in online media and on AIMS' website
- supporting equity of access and providing amenities for people with disabilities in AIMS' public access facilities, such as conference rooms, theatre, library, canteen and display areas
- constructing new facilities that support equity of access
- catering to those with a disability, and providing a wheelchair, if required, on public tours of AIMS
- having mechanisms in place to handle complaints and grievances (formal and informal) to address issues and concerns raised by staff and visitors.

Staff diversity

Equal employment opportunity category	Proportion of total staff 2015–16 (2014–15)
Aboriginal and Torres Strait Islander	0.5 per cent (0.5 %)
Non–English speaking background	15.3 per cent (16.3 %)
Staff with disability	1.5 per cent (1.9 %)
Women	36.8 per cent (35.7 %)

Women in science

The goal of the Women@AIMS Reference Group is to promote diversity and equity within the organisation. The group formed in 2009 and seeks opportunities for creating a flexible and family-friendly work environment. In particular, it identifies issues and barriers that are specific to women in the workplace and aims to provide solutions.

During 2015–16 members of the group participated in a coaching and emotional intelligence program and a public speaking/facilitation personal development workshop.

Code of conduct

AIMS has a code of conduct to which the Council, management, staff and visitors are required to adhere. The code complies with the *Public Governance, Performance and Accountability Act 2014*. New Council members, staff and visitors are briefed on the code during induction. Council members abide by the *Code of Conduct for Directors* published by the AICD.

Workplace behaviour

Management, staff and visitors at AIMS share the responsibility of providing and working in an environment free of harassment and other unacceptable forms of behaviour. In accordance with the AIMS *Code of Conduct*, staff are required to treat others with courtesy, respect, dignity, fairness and equity, and to have concern for their rights, freedoms and individual needs. A high standard of behaviour is expected and AIMS has a set of principles outlining the way staff are expected to behave towards others.

Workplace Harassment Contact Officers are available throughout AIMS to discuss, in confidence, matters of concern regarding harassment and associated issues raised by a staff member. AIMS had one formal reported case of harassment in 2015–16.

Public interest disclosure (whistleblower policy)

AIMS has a whistleblower policy designed to facilitate the effective notification, assessment and management of the disclosure of serious wrongdoings in accordance with the *Public Interest Disclosure Act 2013*.

AIMS strongly encourages the reporting of serious wrongdoing, and will take appropriate and necessary action to uphold the integrity of the Institute and promote public interest. To achieve our goals and obligations in this regard, AIMS is committed to creating and maintaining an environment and culture in which the disclosure of serious wrongdoings is fully supported and protected. AIMS had one formal reported public interest disclosure case in 2015–16.

Disability strategy

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

AIMS' physical resources continue to be upgraded to meet access needs for people with disabilities, which includes provision for people with a disability in building modifications and in the construction of new facilities.

Employee assistance program

Optum Health and Technology Pty Ltd is contracted by AIMS to provide an independent employee assistance program (EAP). The EAP is free to staff, their family members and authorised visitors, and provides for up to ten sessions to assist with issues that may arise in the following areas:

- relationship and family problems
- maximising personal potential and/or performance
- financial and legal concerns
- conflict and communication
- work–life balance
- changes at work, home or elsewhere
- coping skills in dealing with a range of pressures.

Participants can refer themselves or be encouraged by a colleague, a supervisor, human resource staff or workplace health and safety staff to access the program. The utilisation rate during the reporting period was 5.24 per cent, an increase on the 2014–15 rate of 2.84 per cent. Analysis reveals that staff accessed the service primarily for issues of a personal nature.

Financial statements

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INDEPENDENT AUDITOR'S REPORT

To the Minister for Industry, Innovation and Science

I have audited the accompanying annual financial statements of the Australian Institute of Marine Science for the year ended 30 June 2016, which comprise Statement by the Accountable Authority, Chief Executive Officer and Chief Finance Officer; Statement of Comprehensive Income; Statement of Financial Position; Statement of Changes in Equity; Cash Flow Statement; and Notes to and Forming Part of the financial statements.

Opinion

In my opinion, the financial statements of the Australian Institute of Marine Science:

- (a) comply with Australian Accounting Standards and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and
- (b) present fairly the financial position of the Australian Institute of Marine Science as at 30 June 2016 and its financial performance and cash flows for the year then ended.

Accountable Authority's Responsibility for the Financial Statements

The Council of the Australian Institute of Marine Science is responsible under the *Public Governance, Performance and Accountability Act 2013* for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards and the rules made under that Act and is also responsible for such internal control as the Council determines is necessary to enable the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial statements based on my audit. I have conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. These auditing standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the

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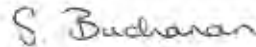
financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the Accountable Authority of the entity, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting my audit, I have followed the independence requirements of the Australian National Audit Office, which incorporate the requirements of the Australian accounting profession.

Australian National Audit Office



Serena Buchanan
Executive Director

Delegate of the Auditor-General

Canberra
12 September 2016



Australian Government

AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

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**STATEMENT BY THE ACCOUNTABLE AUTHORITY,
CHIEF EXECUTIVE OFFICER AND CHIEF FINANCE OFFICER**

In our opinion, the attached Financial Statements for the year ended 30 June 2016 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

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

This statement is made in accordance with a resolution of the Directors.

Signed

The Hon Penelope Wensley AC
Chairman
12 September 2016

Signed

Mr. John Gunn
Chief Executive Officer
12 September 2016

Signed

Mr. Basil Ahyick
Chief Finance Officer
12 September 2016

Townsville address: PMB No 3
Townsville MC, Qld 4810
Tel: (07) 4753 4444
Fax: (07) 4772 5852

Darwin address: PO Box 41775,
Casuarina, NT 0811
Tel: (08) 8920 9240
Fax: (08) 8920 9222

Perth address: The UWA Oceans Institute (M096)
35 Stirling Highway, Crawley, WA 6009
Tel: (08) 6369 4000
Fax: (08) 6488 4585

www.aims.gov.au

Statement of Comprehensive Income

for the period ended 30 June 2016

				Original Budget 2016	Variance ¹ Actual vs 2016 Original Budget
	Notes	2016 \$'000	2015 \$'000	2016 \$'000	\$'000
NET COST OF SERVICES					
Expenses					
Employee benefits	1.1A	26,832	26,841	27,023	191
Suppliers	1.1B	23,372	22,673	28,536	5,164 ²
Depreciation and amortisation	2.2A	12,184	11,870	12,343	159
Foreign exchange loss		53	44	-	(53)
Losses from asset sales		436	95	-	(436)
Total expenses		62,877	61,523	67,902	5,025
Own-source income					
Own-source revenue					
Rendering of services		16,324	17,396	21,673	(5,349) ³
Interest on deposit		1,283	1,367	1,273	10
Other revenue	1.2	354	1,152	150	204
Total own-source revenue		17,961	19,915	23,096	(5,135)
Gains					
Gains from sale of assets		128	43	-	128
Gains other		-	3,544	-	-
Total gains		128	3,587	-	128
Total own-source income		18,089	23,502	23,096	(5,007)
Net cost of services		(44,788)	(38,021)	(44,806)	18
Revenue from Government		40,483	38,796	40,483	-
Surplus/(Deficit)		(4,305)	775	(4,323)	18
OTHER COMPREHENSIVE INCOME					
Changes in asset revaluation surplus		(122)	567	-	(122)
Total other comprehensive income/(loss)		(4,427)	1,342	(4,323)	(104)

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

¹ Variances in brackets represent unfavourable variances.

^{2,3} Budget variances commentary is contained in Budget Variance Commentary Note.

Statement of Financial Position

as at 30 June 2016

				Original Budget 2016	Variance ⁴ Actual vs 2016 Original Budget
	Notes	2016 \$'000	2015 \$'000		
ASSETS					
Financial assets					
Cash and cash equivalents	2.1A	8,338	7,829	250	8,088 ⁵
Trade and other receivables	2.1B	5,211	4,459	4,440	771 ⁶
Other investments	2.1C	28,100	26,700	36,504	(8,404)
Total financial assets		41,649	38,988	41,194	455
Non-financial assets					
Buildings	2.2A	88,792	91,162	90,520	(1,728)
Infrastructure, plant and equipment	2.2A	36,010	38,915	38,340	(2,330)
Computer equipment	2.2A	1,597	1,499	1,755	(158)
Computer software	2.2A	2,376	2,611	2,138	238
Vehicles	2.2A	1,432	1,428	545	887
Office equipment	2.2A	43	85	51	(8)
Ships, launches & vessels	2.2A	19,367	20,155	19,738	(371)
Library books	2.2A	60	102	64	(4)
Inventories		174	172	196	(22)
Other non-financial assets	2.2B	2,481	1,847	2,309	172
Total non-financial assets		152,332	157,976	155,656	(3,324)
Total assets		193,981	196,964	196,850	(2,869)
LIABILITIES					
Payables					
Suppliers	2.3A	3,000	1,757	3,581	581
Other payables	2.3B	3,547	3,126	4,970	1,423 ⁷
Total payables		6,547	4,883	8,551	2,004
Provisions					
Employee provisions	4.1	9,408	9,628	10,225	817
Total provisions		9,408	9,628	10,225	817
Total liabilities		15,955	14,511	18,776	2,821
Net assets		178,026	182,453	178,074	(48)
EQUITY					
Contributed equity		86,607	86,607	86,607	-
Reserves		68,144	68,266	68,253	(109)
Retained surplus/(Accumulated deficit)		23,275	27,580	23,214	61
Total equity		178,026	182,453	178,074	(48)

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

⁴ Variances in brackets represent unfavourable variances.

^{5,6,7} Budget variances commentary is contained in Budget Variance Commentary Note.

Statement of Changes in Equity*for the period ended 30 June 2016*

			Original Budget 2016	Variance ⁸ Actual vs 2016 Original Budget
	Notes	2016 \$'000	2015 \$'000	\$'000
CONTRIBUTED EQUITY				
Opening balance				
Balance carried forward from previous period		86,607	86,607	86,607
Adjusted opening balance		86,607	86,607	86,607
Closing balance as at 30 June		86,607	86,607	86,607
RETAINED EARNINGS				
Opening balance				
Balance carried forward from previous period		27,580	26,805	27,537
Adjusted opening balance		27,580	26,805	27,537
Comprehensive income				
Surplus/(Deficit) for the period		(4,305)	775	(4,323)
Other comprehensive income		-	-	-
Total comprehensive income		(4,305)	775	(4,323)
Closing balance as at 30 June		23,275	27,580	23,214
ASSET REVALUATION RESERVE				
Opening balance				
Balance carried forward from previous period		68,266	67,699	68,253
Adjustment for errors		-	-	-
Adjusted opening balance		68,266	67,699	68,253
Comprehensive income				
Other comprehensive income		(122)	567	-
Total comprehensive income		(122)	567	-
Closing balance as at 30 June		68,144	68,266	68,253
TOTAL EQUITY				
Opening balance				
Balance carried forward from previous period		182,453	181,111	182,397
Adjusted opening balance		182,453	181,111	182,397
Comprehensive income				
Surplus/(Deficit) for the period		(4,305)	775	(4,323)
Movement in reserves		(122)	567	-
Total comprehensive income		(4,427)	1,342	(4,323)
Closing balance as at 30 June		178,026	182,453	178,074

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

⁸ Variances in brackets represent unfavourable variances.

Budget variances commentary is contained in Departmental Budget Variance Commentary Note.

Cash Flow Statement*for the period ended 30 June 2016*

			Original Budget 2016	Variance ⁹ Actual vs 2016 Original Budget
	Notes	2016 \$'000	2015 \$'000	2016 \$'000
OPERATING ACTIVITIES				
Cash received				
Receipts from Government		40,483	38,796	40,483 -
Rendering of services		18,156	18,801	21,662 (3,506) ¹⁰
Interest		1,230	1,377	1,273 (43)
Net GST received		1,140	1,085	- 1,140
Other		310	123	150 160
Total cash received		61,319	60,182	63,568 (2,249)
Cash used				
Employees		27,590	26,401	26,705 (885) ¹¹
Suppliers		25,527	27,318	28,650 3,123
Total cash used		53,117	53,719	55,355 2,238
Net cash from/(used by) operating activities		8,202	6,463	8,213 (10)
INVESTING ACTIVITIES				
Cash received				
Proceeds from sales of property, plant and equipment		440	178	428 12
Total cash received		440	178	428 12
Cash used				
Purchase of property, plant and equipment		6,733	6,232	8,406 1,673 ¹²
Transfer of funds to/from investments		1,400	(5,900)	235 (1,165) ¹³
Total cash used		8,133	332	8,641 508
Net cash from/(used by) investing activities		(7,693)	(154)	(8,213) 520
FINANCING ACTIVITIES				
Cash used				
Repayment of loan		-	471	- -
Net cash from/used by financing activities		-	(471)	- -
Net increase/(decrease) in cash held		509	5,838	- 509
Cash and cash equivalents at the beginning of the reporting period		7,829	1,991	250 7,579
Cash and cash equivalents at the end of the reporting period		8,338	7,829	250 8,088

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

⁹ Variances in brackets represent unfavourable variances.

^{10,11,12,13} Budget Variances Commentary is contained in Budget Variance Commentary Note.

Budget Variances Commentary

The following tables provide a comparison between the 2015-16 Portfolio Budget Statement (PBS) budget and the final financial outcome in the 2015-16 financial statements. The PBS is not audited.

Variances are considered to be "major" based on the following criteria:

- the variance between budget and actual is greater than 10% and
- the variance between budget and actual is greater than 1% of the relevant category (Income, Expense and Equity totals); or
- an item below this threshold is considered important for the reader's understanding or is relevant to an assessment of the discharge of accountability and to an analysis of the performance of AIMS.

Affected line items**Explanations of major variances****Statement of Comprehensive Income**

² Supplier expenses	Variance of \$5.164 million is due to supplier expenses reducing in parallel to reduced earnings from external funding of research projects. Fewer contracts were completed resulting in reduced expenses. In addition, the timing of several projects with related expenses have been moved from 2015-16 to 2016-17 and beyond. Offsetting the reduction in expenses relating to external earnings was an increase in some operational costs.
³ Rendering of services	Variance of \$5.349 million in revenue from rendering of services is the result of some projects being deferred to 2016-17 and beyond and some of the budgeted projects not eventuating.

Statement of Financial Position

⁵ Cash and cash equivalents	Variance of \$8.088 million is due to more cash being held on short term deposits of 3 months or less at reporting date. AIMS budgeted for longer term deposits which are classed as investments, not cash.
⁶ Trade and other receivables	Variance of \$0.771 million has resulted from contracts execution delays resulting in two large receivables being generated at year end.
⁷ Other payables	Variance of \$1.423 million was due to the reduction of unearned revenue which is linked to reduction in external earnings.

Cashflow Statement

¹⁰ Rendering of services	Variance of \$3.506 million is due to less cash received during the year as a reflection of reduced external revenue.
¹¹ Suppliers	Variance of \$3.123 million is due to less payments being made during the year as a reflection of reduced expenditure in relation to external revenue earnings.
¹² Purchase of property plant and equipment	Variance of \$1.673 million is mainly due to the delay in the refurbishment of the Administration building. The budget will be transferred to 2016-17.
¹³ Transfer of funds to/from investment	Variance of \$1.165 million is the result of transferring funds between short-term and long-term investments.

Overview

Objective of Australian Institute of Marine Science

Australian Institute of Marine Science (AIMS) is an Australian Government controlled entity. It is a not-for-profit entity. The objective of AIMS is to undertake scientific research in support of the protection and sustainable development of Australia's marine resources.

AIMS is structured to meet one outcome:

Outcome 1: Growth of knowledge to support protection and sustainable development of Australia's marine resources through innovative marine science and technology.

The continued existence of AIMS in its present form and with its present programs is dependent on Government policy and on continuing funding by Parliament for AIMS administration and science research programs.

Basis of preparation of the financial statements

The Financial Statements are general purpose financial statements and are required by section 42 of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

The financial statements have been prepared in accordance with:

- Public Governance, Performance and Accountability (Financial Reporting) Rule 2015 (FRR) for reporting periods ending on or after 1 July 2015; and
- Australian Accounting Standards and Interpretations issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position.

The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

Accounting judgements and estimates

Recognition of revenue for rendering of services – *Refer Note 1.2 Own-Source Revenue and Gains*

Impairment of trade receivables – *Refer Note 2.1B: Trade and Other Receivables*

Fair value of buildings, plant and equipment – *Refer Note 2.2 Non-Financial Assets*

Remaining useful lives of buildings, infrastructure, plant and equipment - *Refer Note 2.2 Non-Financial Assets*

Employee entitlement provision – *Refer Note 4.1: Employee Provisions*

Contingent assets and contingent liabilities – *Refer Note 5.1 Contingent Assets and Liabilities*

No accounting assumptions or estimates have been identified that have a significant risk of causing a material adjustment to carrying amounts of assets and liabilities within the next accounting period.

Overview (cont'd)

New Australian accounting standards

Adoption of New Australian Accounting Standard Requirements

AASB 2015-7 has been adopted earlier than the application date as stated in the standard. No other accounting standard has been adopted earlier than the application date.

The following new standards, revised standards, interpretations, amending standards were issued prior to the signing of the statements by the Chairman of Council, Chief Executive Officer and Chief Financial Officer, were applicable to the current reporting period and had impact as to disclosure on AIMS financial statements.

i) *AASB 2010-7 Amendments to Australian Accounting Standards arising from AASB 9 (December 2010)*

AASB 2010-7 makes changes to a number of Standards and Interpretations resulting from the re-issuance of AASB 9 Financial Instruments in December 2010. These changes ensure other standards remain consistent with the new requirements of revised AASB 9 (effective from 1 July 2015).

ii) *AASB 2015-3 Amendments to Australian Accounting Standards arising from the withdrawal of AASB 1031 Materiality (1 July 2015)*

AASB 2015-3 withdraws AASB 1031 Materiality and deletes references to AASB 1031 in all Australian Accounting Standards.

iii) *AASB 1048 Interpretations of Standards (August 2015)*

AASB 1048 lists all Australian Interpretations on issue and is updated when a new or revised Interpretation is issued. The revised and reissued August 2015 version supersedes the version issued in December 2013.

iv) *AASB 2015-7 Amendments to Australian Accounting Standards – Fair Value Disclosures of Not-for-Profit Entities (1 July 2016)*

AASB 2015-7 relieves not-for-profit public sector entities from certain disclosures specified in AASB 13 for assets within the scope of AASB 116 that are held primarily for their current service potential rather than to generate future net cash inflows for recurring and non-recurring fair value measurements categorised within Level 3 of the fair value hierarchy

Other new standards, revised standards, interpretations, amending standards that were issued prior to the sign-off date and are applicable to the current reporting period did not have a financial impact, and are not expected to have a future financial impact on AIMS' financial statements.

Future Australian Accounting Standard Requirements

i) *AASB 2015-6 Amendments to Australian Accounting Standards – Extending Related Party Disclosure to Not-for Profit Public Sector Entities (1 July 2016)*

The key impact of the amendments is to specify consistent related party disclosure requirements for the Australian Government and will have impact on future disclosures in AIMS' financial statements.

Other new standards, revised standards, interpretations, amending standards that were issued prior to the sign-off date and are applicable to future reporting periods are not expected to have a future material impact on AIMS' financial statements.

Taxation

AIMS is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Events after the reporting period

AIMS is not aware of any material events that have occurred since balance date.

Notes to the financial statements

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Financial Performance

1.1 Expenses

	2016	2015
	\$'000	\$'000
1.1A: Employee Benefits		
Wages and salaries	18,965	19,601
Superannuation;		
Defined contribution plans	1,795	1,562
Defined benefit plans	1,805	1,715
Leave and other entitlements	3,148	3,206
Redundancies	1,119	757
Total employee benefits	26,832	26,841

Accounting Policy

Accounting policies for employee related expenses are contained in the People and relationships section.

1.1B: Suppliers

Goods and services supplied or rendered

Audit Fees	53	53
Consultants	19	87
Contractors	2,030	2,215
Consumables	1,599	1,805
Electricity	1,382	1,339
Fuel, oil and gas	664	946
Hire of equipment	836	1,014
Repairs and maintenance	3,559	3,195
Support for post-doctorate positions	2,610	1,801
Travel and accommodation	1,536	1,485
Vessel management and staffing	3,435	3,436
Other	5,602	5,226
Total goods and services supplied or rendered	23,325	22,602
Goods supplied	5,254	5,235
Services rendered	18,071	17,367
Total goods and services supplied or rendered	23,325	22,602

Other suppliers

Operating lease rentals in connection with		
Minimum lease payments	4	4
Workers compensation expenses	43	67
Total other suppliers	47	71
Total suppliers	23,372	22,673

Leasing commitments

AIMS in its capacity as lessor has significant leasing arrangements with Port of Townsville for berthing facilities and Australian National University for ATRF Darwin land. Both include GST & CPI annual inflator escalation clauses.

Commitments for minimum lease payments in relation to non-cancellable operating leases are payable as follows:

Within 1 year	74	75
Between 1 to 5 years	297	301
More than 5 years	1,116	1,397
Total operating lease commitments	1,487	1,773

1.2 Own-Source Revenue and Gains

Own-source revenue

Accounting Policy

Revenue from the sale of goods is recognised when:

- a) the risks and rewards of ownership have been transferred to the buyer;
- b) AIMS retains no managerial involvement or effective control over the goods;
- c) the revenue and transaction costs incurred can be reliably measured; and
- d) it is probable that the economic benefits associated with the transaction will flow to AIMS.

Revenue from rendering of services is recognised by reference to the stage of completion of contracts at the reporting date. The revenue is recognised when:

- a) the amount of revenue, stage of completion and transaction costs incurred can be reliably measured; and
- b) the probable economic benefits associated with the transaction will flow to AIMS.

The stage of completion of contracts at the reporting date is determined by reference to the proportion that costs incurred to date bear to the estimated cost of the transaction. Where losses are anticipated they are provided for in full.

Accounting Judgements and Estimates

Revenue recognition for rendering of services is accounted for on a percentage completed basis which determines the timing of revenue recognition and the amount of revenue recognition. The determination of the percentage of complete requires judgement in relation to determining the costs to date of the project, budgeted costs to complete the contract values including variations.

Accounting Policy

Interest Revenue

Interest Revenue is recognised using the effective interest method as set out in AASB 139 *Financial Instruments: Recognition and Measurement*.

Accounting Policy

Revenue from Government

Funding received or receivable from agencies (appropriated to AIMS as a non-corporate body payment item) is recognised as revenue from Government unless they are in the nature of an equity injection or loan.

	2016	2015
	\$'000	\$'000
1.2: Other Revenue		
Insurance claims	288	92
Qld Government debt forgiveness	-	1,029
Other	66	31
Total other revenue	354	1,152

Accounting Policy

Resources Received Free of Charge

Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense. Resources received free of charge are recorded as either revenue or gains depending on their nature.

Financial Position

This section analyses AIMS assets used to conduct its operations and the operating liabilities incurred as a result. Employee related information is disclosed in the People and Relationships

2.1 Financial Assets

	2016	2015
	\$'000	\$'000

2.1A: Cash and Cash Equivalents

Cash on hand	6	6
Cash on Deposit	8,332	7,823
Total cash and cash equivalents	8,338	7,829

Accounting Policy

Cash is recognised at its nominal amount. Cash and cash equivalents include:

- cash on hand; and
- demand deposits in bank accounts with an original maturity of 3 months or less that are readily convertible to known amounts of cash and subject to insignificant risk or changes in value.

2.1B: Trade and Other Receivables

Services receivables

Services	4,467	3,789
Total services receivables	4,467	3,789

Other receivables

Interest	491	439
GST receivable from Australian Taxation Office	253	201
Other	-	30
Total other receivables	744	670
Total trade and other receivables (gross)	5,211	4,459

Trade and other receivables (net) expected to be recovered

No more than 12 months	5,211	4,459
Total trade and other receivables (net)	5,211	4,459

Trade and other receivables (gross) aged as follows

Not overdue	5,058	3,724
Overdue by:		
0 to 30 days	-	465
31 to 60 days	76	209
61 to 90 days	-	61
More than 90 days	77	-
Total trade and other receivables (net)	5,211	4,459

Credit terms for goods and services were within 30 days (2015: 30days).

Accounting Policy

Receivables include trade receivables and contract works in progress based on stage of completion.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts less any impairment allowance. Collectability of debts is reviewed as at the end of reporting period. Allowances are made when collectability of the debt is no longer probable.

Accounting Judgements and Estimates

Impairment of trade receivables

Collectability of trade receivables is reviewed on an ongoing basis. Debts which are known to be uncollectible are written off as an expense. An allowance account (provision for impairment of trade receivables) is used when there is objective evidence that AIMS will not be able to collect all amounts due, according to the original terms of the receivables.

2.1 Financial Assets (cont'd)

	2016	2015
	\$'000	\$'000
2.1C: Other Investments		
Deposits	28,100	26,700
Total other investments	28,100	26,700
Other investments expected to be recovered		
No more than 12 months	28,100	26,700
Total other investments	28,100	26,700

Accounting Policy*Held-to-Maturity investments*

Non-derivative financial assets with fixed determinable payments and fixed maturity dates that the group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments..

Held -to-maturity investments are recorded at amortised cost.

2.2 Non-Financial Assets

2.2A: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

Reconciliation of the opening and closing balances of property, plant and equipment for 2016

	Infrastructure		Computer		Vehicles		Office		Ships, Launches & Vessels		Library		Total	
	Buildings	Plant and Equipment	Equipment	Software	Equipment	Software	Equipment	Software	Equipment	Software	Books	Books	\$'000	\$'000
As at 1 July 2015														
Gross book value	92,213	40,113	1,622	2,711	1,570	2,711	98	20,481	114	158,922				
Accumulated depreciation, amortisation and impairment	(1,051)	(1,198)	(123)	(100)	(142)	(100)	(13)	(326)	(12)	(2,965)				
Total as at 1 July 2015	91,162	38,915	1,499	2,611	1,428	2,611	85	20,155	102	155,957				
Additions														
Purchase	1,845	2,376	664	-	892	-	-	559	-	6,336				
Internally developed	-	-	-	438	-	438	-	-	-	438				
Depreciation and amortisation	(4,215)	(4,862)	(561)	(551)	(567)	(551)	(42)	(1,344)	(42)	(12,184)				
Revaluation reserve	-	-	-	(122)	-	(122)	-	-	-	(122)				
Disposals	-	(419)	(5)	-	(321)	-	-	(3)	-	(748)				
Total as at 30 June 2016	88,792	36,010	1,597	2,376	1,432	2,376	43	19,367	60	149,677				
Total as at 30 June 2016 represented by														
Gross book value	94,058	41,992	2,278	4,019	1,894	4,019	98	21,034	114	165,487				
Accumulated depreciation, amortisation and impairment	(5,266)	(5,982)	(681)	(1,643)	(462)	(1,643)	(55)	(1,667)	(54)	(15,810)				
Total as at 30 June 2016	88,792	36,010	1,597	2,376	1,432	2,376	43	19,367	60	149,677				

Depreciation rates are based on the following useful lives:

1. The carrying amount of computer software included \$160,034 purchased software and \$2,216,878 internally generated software.
2. No property, plant and equipment and intangibles are expected to be sold or disposed of within the next 12 months.

Revaluations of non-financial assets

All revaluations were conducted in accordance with the revaluation policy. On the 31 May 2016, an independent valuer, Pickles Valuation Services conducted the revaluations. No indicators of impairment were found for buildings, infrastructure, plant and equipment and other non-financial assets. The valuation process was reviewed in June 2016 and was in compliance with AASB13. The valuation was deemed reasonable; therefore no adjustments required.

Revaluation policy states that fair value of each class of asset is measured at open market value where such a market exists or current replacement cost. In the case of buildings, an open market does not exist therefore current replacement cost is used.

Contractual commitments for the acquisition of property, plant, equipment and intangible assets.

Contributions to the Indian Ocean Marine Research Centre at the University of Western Australia and purchase orders for the refurbishment of AIMS buildings.

Within 1 year	2016	2015
Between 1 to 5 years	\$'000	\$'000
Total Contractual Commitments	1,627	1,741
	825	825
	2,452	2,566

2.2 Non-Financial Assets (cont'd)

2.2A: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

Reconciliation of the opening and closing balances of property, plant and equipment for 2015

	Infrastructure		Computer		Computer		Vehicles		Equipment		Office		Ships, Launches & Vessels		Library Books		Total	
	Buildings	Plant and Equipment	Equipment	Software	Software	Software	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment	Equipment
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
As at 1 July 2014																		
Gross book value	91,103	47,785	2,167	3,159	1,891	107	21,844	337	168,393									
Accumulated depreciation and impairment	(3,591)	(3,964)	(532)	(720)	(488)	(18)	(1,314)	(38)	(10,665)									
Net book value 1 July 2014	87,512	43,821	1,635	2,439	1,403	89	20,530	299	157,728									
Additions:																		
By purchase	2,301	1,753	384	53	473	-	840	-	5,804									
Internally developed	-	-	-	428	-	-	-	-	428									
Reclassifications/cost adjustments	3,543	-	-	-	-	-	-	-	-									
Depreciation/amortisation expense	(4,287)	(4,683)	(542)	(399)	(548)	(25)	(1,345)	(41)	(11,870)									
Revaluation reserve - cost write back	(4,734)	(9,322)	(919)	90	(642)	(9)	(2,188)	(223)	(17,947)									
Revaluation reserve - depreciation write back	6,827	7,446	946	-	853	30	2,332	67	18,501									
Disposals	-	(100)	(5)	-	(111)	-	(14)	-	(230)									
Net book value 30 June 2015	91,162	38,915	1,499	2,611	1,428	85	20,155	102	155,957									
Total as at 30 June 2015 represented by:																		
Gross book value	92,213	40,113	1,622	2,711	1,570	98	20,481	114	158,922									
Accumulated depreciation and impairment	(1,051)	(1,198)	(123)	(100)	(142)	(13)	(326)	(12)	(2,965)									
Total as at 30 June 2015	91,162	38,915	1,499	2,611	1,428	85	20,155	102	155,957									
Depreciation rates are based on the following useful lives:	9-69 yrs	3-47 yrs	3-28 yrs	2-10 yrs	3-20 yrs	4-56 yrs	4-25 yrs	3-100 yrs										

NOTE 2.2A: Non-Financial Assets (cont'd)**Accounting Policy**

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

Asset recognition threshold

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

Revaluations

Following initial recognition at cost, property, plant and equipment are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depends upon the volatility of movements in market values for the relevant assets but is carried out at least every three years.

Revaluation adjustments are made on a class basis. Any revaluation increments are credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

Depreciation

Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the entity using, in all cases, the straight-line method of depreciation. Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current and future reporting periods, as appropriate.

Impairment

All assets were assessed for impairment at 30 June 2016. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs to sell and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows, and the asset would be replaced if AIMS was deprived of the asset, its value in use is taken to be its depreciated replacement cost.

Derecognition

An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Intangibles

AIMS' intangibles comprise software. These assets are carried at cost less accumulated amortisation and accumulated impairment losses. Software is amortised on a straight-line basis over its anticipated useful life. All software assets were assessed for indications of impairment as at 30 June 2016.

NOTE 2.2A: Non-Financial Assets (cont'd)**Accounting Judgements and Estimates***Fair value of buildings, plant and equipment*

The buildings, plant and equipment have been valued at depreciated replacement cost by an independent valuer. The independent valuer deemed that the assets would seldom trade on the open market due to their specialised nature and have therefore adopted this revaluation approach.

Remaining useful lives of buildings, infrastructure, plant and equipment

The independent valuer has undertaken an assessment of the remaining useful lives of buildings, infrastructure, plant and equipment based on their condition and expected usage. The remaining useful lives have been reviewed and adopted by AIMS.

2.2 Non-Financial Assets (cont'd)

	2016	2015
	\$'000	\$'000

2.2B: Other Non-Financial Assets

Prepayments	2,481	1,847
Total other non-financial assets	2,481	1,847

Other non-financial assets expected to be recovered

No more than 12 months	647	335
More than 12 months	1,834	1,512
Total other non-financial assets	2,481	1,847

No indicators of impairment were found for other non-financial assets.

2.3 Payables

	2016	2015
	\$'000	\$'000

2.3A: Suppliers

Trade creditors and accruals	3,000	1,757
Total suppliers	3,000	1,757

Suppliers expected to be settled

No more than 12 months	3,000	1,757
Total suppliers	3,000	1,757

Settlement was usually made within 30 days.

2.3B: Other Payables

Unearned revenue	3,299	2,331
Salaries and wages including oncosts	248	795
Total other payables	3,547	3,126

Other payables to be settled

No more than 12 months	3,547	3,126
Total other payables	3,547	3,126

3: Cash Flow Reconciliation

	2016 \$'000	2015 \$'000
Reconciliation of cash and cash equivalents as per statement of financial position and cash flow statement		
Cash and cash equivalents as per		
Cash flow statement	8,338	7,829
Statement of financial position	8,338	7,829
Discrepancy	-	-
Reconciliation of net cost of services to net cash from operating activities		
Net cost of services	(44,788)	(38,021)
Revenue from Government	40,483	38,796
Adjustments for non-cash items		
Depreciation/amortisation	12,184	11,870
Gain on disposal of assets	(128)	(43)
Loss on disposal of assets	436	95
Loss on revaluation of an asset	-	13
Gain from donation of ATRF building	-	(3,544)
Other non-cash items	(41)	(1,029)
Movement in assets and liabilities		
Assets		
(Increase)/Decrease in net receivables	(752)	974
(Increase)/Decrease in inventories	(1)	1
(Increase)/Decrease in prepayments	(634)	(360)
Liabilities		
Increase/(Decrease) in employee provisions	(220)	542
Increase/(Decrease) in suppliers payables	1,663	(2,831)
Net cash from/(used by) operating activities	8,202	6,463

People and relationships

This section describes a range of employment and post employment benefits provided to our people and our relationships with other key people.

4.1 Employee Provisions

	2016 \$'000	2015 \$'000
Leave	8,213	8,387
Superannuation	1,184	1,221
Other	11	20
Total employee provisions	9,408	9,628
Employee provisions expected to be settled in:		
No more than 12 months	2,245	3,279
More than 12 months	7,163	6,349
Total employee provisions	9,408	9,628

Accounting Policy

Liabilities for 'short-term employee benefits' and termination benefits expected within twelve months of the end of reporting period are measured at their nominal amounts.

Other long-term employee benefits are measured as net total of the present value of the defined benefit obligation at the end of the reporting period minus the fair value at the end of the reporting period of plan assets (if any) out of which the obligations are to be settled directly.

Leave

The liability for employee benefits includes provision for annual leave and long service leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including AIMS' employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the work of an actuary as at 30 June 2016. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and redundancy

Provision is made for separation and redundancy benefit payments. AIMS recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Superannuation

The entity's staff are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the PSS accumulation plan (PSSap), Uni Super, Australian Super (AUS) Australian Ethical and Sunsuper.

The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap, Uni Super, AUS, Australian Ethical and Sunsuper are defined (accumulated funds) contribution schemes.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance's administered schedules and notes.

AIMS makes employer contributions to the employees' defined benefit superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. AIMS accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June represents outstanding contributions for the final pay of the year.

4.2 Senior Management Personnel Remuneration

	2016 \$'000	2015 \$'000
Short-term employee benefits		
Salary	2,032	2,002
Performance bonuses	123	151
Motor vehicle and other allowances	167	184
Total short-term employee benefits	2,322	2,337
Post-employment benefits		
Superannuation	472	337
Total post-employment benefits	472	337
Other long-term employee benefits		
Annual leave	211	217
Long-service leave	49	48
Total other long-term employee benefits	260	265
Total senior executive remuneration expenses	3,054	2,939

The total number of senior management personnel that are included in the above table are 19 senior individuals (2015: 22 individuals). The number of senior executives was less than 2015 as during 2015 there was a changeover of directors which resulted in an increase in that financial year.

4.3 Related Party Disclosures

Loans to Directors and Director-Related Entities

There were no loans made to any Director or Director-related entities during the year (2015-Nil).

Other Transactions with Directors or Director-Related Entities

There were no other transactions with Directors or Director-related entities during the year (2015-Nil).

Managing uncertainties

5.1 Contingent Assets and Liabilities

	Debt forgiveness		Guarantees		Total	
	2016 \$'000	2015 \$'000	2016 \$'000	2015 \$'000	2016 \$'000	2015 \$'000
Contingent assets						
Balance from previous period	-	500	322	331	322	831
New contingent assets recognised	-	-	65	-	65	-
Rights expired	-	(500)	(62)	(9)	(62)	(509)
Total contingent assets	-	-	325	322	325	322

Quantifiable Contingencies

AIMS holds performance guarantees of \$325,000 (2015: \$322,000). Performance guarantees include Bank guarantees in relation to the refurbishment of the AIMS's buildings.

Unquantifiable Contingencies

At 30 June 2016, AIMS had a 23 year lease on a berthing facility with Port of Townsville. At the expiry of the lease AIMS is required to carry out at its own cost remediation work necessary to return the level of contamination in the leased land to a level as prescribed by Assessment and Management of Contaminated Land in Queensland (May 1998). AIMS is unable to reliably estimate the cost of any future remediation.

Accounting Judgements and Estimates

Contingent liabilities and contingent assets are not recognised in the statement of financial position but are reported in the notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

5.2 Financial Instruments

	2016 \$'000	2015 \$'000
5.2A: Categories of Financial Instruments		
Financial Assets		
Held-to-maturity investments		
Investments	28,100	26,700
Total held-to-maturity investments	28,100	26,700
Loans and receivables		
Cash at bank	8,338	7,829
Services receivables	4,467	3,789
Other receivables	491	439
Total loans and receivables	13,296	12,057
Total financial assets	41,396	38,757
Financial Liabilities		
Financial liabilities measured at amortised cost		
Trade creditors	3,000	1,757
Unearned revenue	3,299	2,331
Total financial liabilities	6,299	4,088

Accounting Policy

Financial assets

AIMS classifies its financial assets in the following categories:

- a) held-to-maturity investments and
- b) loans and receivables.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition.

Financial Assets are recognised and derecognised upon trade date.

Held-to-maturity investments

Non-derivative financial assets with fixed or determinable payments and fixed maturity dates that AIMS has the positive intent and ability to hold to maturity are classified as held-to-maturity investments. Held-to-maturity investments are recorded at amortised cost.

Loans and receivables

Trade receivables, loans and other receivables that have fixed or determinable payments that are not quoted in an active market are classified as 'loans and receivables'. Loans and receivables are measured at amortised cost.

Impairment of financial assets

Financial assets are assessed for impairment at the end of each reporting period.

Financial assets held at amortised cost - if there is objective evidence that an impairment loss has been incurred for loans and receivables or held-to-maturity investments held at amortised cost, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows discounted at the asset's original effective interest rate. The carrying amount is reduced by way of an allowance account. The loss is recognised in the Statement of Comprehensive Income.

Financial liabilities

Financial liabilities are classified as either financial liabilities 'at fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

Financial Liabilities at Fair Value Through Profit or Loss

Financial liabilities at fair value through profit or loss are initially measured at fair value. Subsequent fair value adjustments are recognised in profit or loss. The net gain or loss recognised in profit or loss incorporates any interest paid on the financial liability.

Other Financial Liabilities

Other financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

5.2 Financial Instruments (cont'd)

	2016	2015
	\$'000	\$'000

5.2B: Net Gains or Losses on Financial Assets**Held-to-maturity investments**

Interest revenue	1,283	1,367
Net gains on financial assets	1,283	1,367

5.2C: Fair Value of Financial Instruments

	Carrying amount 2016 \$'000	Fair value 2016 \$'000	Carrying amount 2015 \$'000	Fair value 2015 \$'000
Financial assets				
Cash at bank	8,338	8,338	7,829	7,829
Services receivables (net)	4,467	4,467	3,789	3,789
Other receivables	491	491	439	439
Investments	28,100	28,100	26,700	26,700
Total financial assets	41,396	41,396	38,757	38,757
Financial liabilities				
Trade creditors	3,000	3,000	1,757	1,757
Unearned revenue	3,299	3,299	2,331	2,331
Total financial liabilities	6,299	6,299	4,088	4,088

The fair values disclosed in the above table have been determined based on the following methodology: Cash and cash equivalents, receivables for goods and services, trade and other payables are short-term instruments in nature whose carrying value is equivalent to fair value. Trade and other payables excludes amounts relating to the provision of annual leave, which is not considered a financial instrument.

5.2D: Credit Risk

AIMS is exposed to minimal credit risk as the majority of receivables is cash. The maximum exposure to credit risk is the risk that arises from potential default of a debtor. This amount is equal to the total amount of trade receivables (2016: \$4,466,662 and 2015: \$3,788,635).

AIMS manages its credit risk by entering into contracts with external parties prior to establishing a debtor relationship.

In addition, AIMS has policies and procedures that guide employees debt recovery techniques that are to be applied.

AIMS holds no collateral to mitigate against credit risk.

5.2 Financial Instruments (cont'd)**5.2D: Credit Risk (cont'd)****Credit quality of financial assets not past due or individually determined as impaired**

	Not past due nor impaired	Not past due nor impaired	Past due or impaired	Past due or impaired
	2016 \$'000	2015 \$'000	2016 \$'000	2015 \$'000
Investments	28,100	26,700	-	-
Cash at bank	8,338	7,829	-	-
Receivables for services	4,314	3,053	153	736
Total	40,752	37,582	153	736

Credit risk related to balances with banks is managed by the management committee in accordance with approved Council policy. Such policy requires that surplus funds are only invested with Commonwealth Bank of Australia, Westpac Banking Corporation, National Australia Bank and Australia and New Zealand Banking Group Ltd. The maximum amount invested with an eligible authorised deposit-taking institution shall not exceed 50% of total investments.

Ageing of financial assets that were past due but not impaired in 2016

	0 to 30 days \$'000	31 to 60 days \$'000	61 to 90 days \$'000	90+ days \$'000	Total \$'000
Receivables for services	-	76	-	77	153
Total	-	76	-	77	153

Ageing of financial assets that were past due but not impaired in 2015

	0 to 30 days \$'000	31 to 60 days \$'000	61 to 90 days \$'000	90+ days \$'000	Total \$'000
Receivables for services	465	210	61	-	736
Total	465	210	61	-	736

5.2E: Liquidity Risk

AIMS financial liabilities are payables, consultancies and grants. The exposure to liquidity risk is based on the notion that AIMS will encounter difficulty in meeting its obligations associated with financial liabilities. This is highly unlikely due to the appropriation funding available to AIMS. The following table illustrates the maturities of financial liabilities.

Maturities for non-derivative financial liabilities in 2016

	Within 1 year \$'000	Between 1 to 2 years \$'000	Between 2 to 5 years \$'000	More than 5 years \$'000	Total \$'000
Trade creditors	3,000	-	-	-	3,000
Unearned revenue	3,299	-	-	-	3,299
Total	6,299	-	-	-	6,299

Maturities for non-derivative financial liabilities in 2015

	Within 1 year \$'000	Between 1 to 2 years \$'000	Between 2 to 5 years \$'000	More than 5 years \$'000	Total \$'000
Trade creditors	1,757	-	-	-	1,757
Unearned revenue	2,331	-	-	-	2,331
Total	4,088	-	-	-	4,088

AIMS has no derivative financial liabilities in both the current and prior year.

AIMS receives appropriation funding from the Australian Government. AIMS manages its budgeted funds to ensure it has adequate funds to meet payments as and when they fall due. In addition, AIMS has policies in place to ensure timely payments are made when due and has no past experience of default.

Note 5.3 Fair Value Measurements

The following tables provide an analysis of assets and liabilities that are measured at fair value.

The different levels of the fair value hierarchy are defined below.

Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at measurement date.

Level 2: Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.

Level 3: Unobservable inputs for the asset or liability.

5.3A: Fair Value Measurement

	Fair value measurements at the end of the reporting period						Valuation technique(s)	Inputs used
	2016	2016	2016	2015	2015	2015		
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000		
	Level 2	Level 3	Total	Level 2	Level 3	Total		
Non-financial assets								
Buildings		88,792	88,792	-	91,162	91,162	Cost Approach	Replacement cost rates – new
Plant and equipment	636	35,374	36,010	795	38,120	38,915	Market & Cost Approach	Observable market data and replacement costs
Ships, launches and vessels	291	19,076	19,367	328	19,828	20,156	Market & Cost Approach	Observable market data and replacement costs
Computer equipment	1,597	-	1,597	1,499	-	1,499	Market approach	Observable market data
Vehicles	1,432	-	1,432	1,428	-	1,428	Market approach	Observable market data
Office equipment	43	-	43	85	-	85	Market approach	Observable market data
Library books	60	-	60	102	-	102	Market approach	Observable market data
Total non-financial assets	4,059	143,242	147,301	4,237	149,110	153,347		
Total fair value measurements of assets in the statement of financial position			147,301			153,347		

AIMS does not measure any liabilities at Fair Value on a recurring basis.

The carrying amounts of trade receivables and trade payables are assumed to approximate their Fair Values due to their short term nature (Level 2).

Fair value measurements - highest and best use differs from current use for non-financial assets (NFAs)

During valuation review management determined that for all assets carried at fair value there is no difference between highest and best use from current use.

Note 5.3A: Fair Value Measurements (cont'd)

There were no transfers between level 1 and level 2 for recurring assets.

Recurring level 3 fair value

For assets that Pickles Valuation Services (PVS) were unable to identify a market comparison an alternative approach was required. These assets were valued by the cost approach, a current replacement cost (CRC) approach, containing level 3 inputs. In doing so, PVS reviewed the replacement cost rates.

The significant unobservable inputs used in the fair value measurement of the level 3 items are replacement cost rates and/or consumed economic benefit/obsolescence. Significant increases/(decreases) in replacement cost rates and/or consumed economic benefit/obsolescence would result in significantly higher/(lower) fair value measurement.

5.3B: Reconciliation for Recurring Level 3 Fair Value Measurements**Recurring Level 3 fair value measurements - reconciliation for assets**

	Non-financial assets							
	Buildings		Plant & Equipment		Ship & Vessels		Total	Total
	2016	2015	2016	2015	2016	2015	2016	2015
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
As at 1 July	91,162	87,512	38,120	38,367	19,828	20,080	149,110	145,959
Purchases	1,845	2,301	2,376	1,801	559	840	4,779	4,942
Other movements	(4,215)	1,349	(5,122)	(2,048)	(1,311)	(1,092)	(10,648)	(1,791)
Total as at 30 June	88,792	91,162	35,374	38,120	19,076	19,828	143,242	149,110

1. No change in valuation technique occurred during the period.

Valuation processes

In the current year a desktop valuation review was completed by Pickles Valuation Services (PVS), Certified Practicing Valuers with the Australian Property Institute who completed a comprehensive valuation in the prior year. For assets classified as having Level 2 inputs, PVS compared the Written Down Value (WDV) of the assets against similar assets in the most appropriate active market. This enabled PVS to ascertain that the WDV was materially in line with observable market data. For assets that PVS were unable to be valued by identifiable observable market data an alternative approach was utilised. These assets were valued by the cost approach method, a depreciated replacement cost (DRC) approach, utilising Level 3 Inputs. In doing so, the PVS review ensured the estimated replacement cost, total useful lives (TUL), and remaining useful lives (RUL) were in line with industry standards to ensure the DRC calculation was reliable. PVS have relied upon previous valuation and asset lives data to conduct this review.

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Appendix 1. Science publications

In 2015, AIMS scientists published:

- 186 journal articles (see [AIMS publications database](#)⁹)
- 5 book chapters (see [AIMS publications database](#))
- 1 conference paper
- 29 reports
- 29 theses.

Journal articles

- 1 Ainsworth TD, Krause L, Bridge T, Torda G, Raina J-B, Zakrzewski M, Gates R, Padilla-Gamiño J, Spalding HL, Smith C, Woosley ES, Bourne DG, Bongaerts P, Hoegh-Guldberg O, Leggat W (2015) The coral core microbiome identifies rare bacterial taxa as ubiquitous endosymbionts. *The ISME Journal* 9(10): 2261–2274
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- 11 Bourne DG, Ainsworth TD, Pollock FJ, Willis BL (2015) Towards a better understanding of white syndromes and their causes on Indo-Pacific coral reefs. *Coral Reefs* 34(1): 233–242
- 12 Brachert TC, Reuter M, Krüger S, Klaus JS, Helmle K, Lough JM (2015) Low Florida coral calcification rates in the Plio-Pleistocene. *Biogeosciences Discussions* 12: 20515–20555
- 13 Brewer TD, Moon K (2015) Towards a functional typology of small-scale fisheries co-management informed by stakeholder perceptions: A coral reef case study. *Marine Policy* 51: 48–56
- 14 Brinkman DL, Jai X, Potriquet J, Kumar D, Dash D, Kvaskoff D, Mulvenna J (2015) Transcriptome and venom proteome of the box jellyfish *Chironex fleckeri*. *BMC Genomics* 16: 407
- 15 Campbell CA, Lefroy EC, Caddy-Retalic S, Bax N, Doherty PJ, Douglas MM, Johnson D, Possingham HP, Specht A, Tarte D, West J (2015) Designing environmental research for impact. *Science of The Total Environment* 534: 4–13
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Theses completed

Doctor of Philosophy (PhD)

- 1 Currey, Leanne (2015) Movement of an exploited coral reef teleost across multiple temporal and spatial scales. Thesis (PhD) James Cook University
- 2 Espinoza, Mario (2015) Movements, habitat use and connectivity of reef-associated sharks: Implications for management and conservation. Thesis (PhD) James Cook University
- 3 Sinclair, Alison (2015) Stable lead isotopes, trace metals and radionuclides in sediments of the Alligator Rivers region to assess impacts of uranium mining. Thesis (PhD) Charles Darwin University
- 4 Genodepa, Jerome (2016) Digestive enzyme dynamics during early life stages of the mud crab, *Scylla serrata* and the spiny lobster, *Panulirus ornatus*. Thesis (PhD) James Cook University
- 5 Javed, Wajid (2015) Iron cycling in an acid rock drainage pit—microbes and mechanisms. Thesis (PhD) Charles Darwin University
- 6 Jin, Young Koo (2016) Nature or nurture? testing the correlation between stress tolerance and genotype in *Acropora millepora* on the Great Barrier Reef. Thesis (PhD) James Cook University
- 7 Lédée, Elodie (2016) Improving understanding of spatial ecology through network analysis of acoustic monitoring data. Thesis (PhD) James Cook University
- 8 Pisapia, Chiara (2015) Drivers of colony-level variation in conditions and resilience for reef-building corals. Thesis (PhD) James Cook University

- 9 Pollock, F. Joseph (2015) Understanding the drivers of white syndrome coral diseases on Indo–Pacific reefs. Thesis (PhD) James Cook University. Awarded *cum laude*
- 10 Ong, Robert (2015) Development and validation of computational fluid dynamics models for the coupled simulation of heat transfer and fluid flow in the coral microenvironments. Thesis (PhD) Curtin University
- 11 Reisser, Julia (2015) Plastic debris at the sea surface. Thesis (PhD) University of Western Australia
- 12 Rizzari, Justin (2015) Indirect effect of predators on coral reef trophic ecology. Thesis (PhD) James Cook University
- 13 Schmidt, Christiane (2015) Global change stress on symbiont-bearing benthic foraminifera. Thesis (PhD) University of Bremen
- 14 Slivkoff, Matthew (2016) Ocean colour remote sensing of the Great Barrier Reef waters. Thesis (PhD) Curtin University
- 15 Tan, Chung Hong (James) (2015) Environmental and genetic drivers of growth and reproduction in corals. Thesis (PhD) James Cook University
- 16 Tedeschi, Jamie (2015) Assessing the resilience of sea turtle embryos to extreme temperatures. Thesis (PhD) University of Western Australia
- 17 Tout, Jessica (2016) Exploring the function and behaviour of natural populations of coral reef microbes. Thesis (PhD) University of Technology Sydney
- 18 Udyawer, Vinay (2016) Spatial ecology of true sea snakes (hydrophiinae) in coastal waters of north Queensland. Thesis (PhD) James Cook University
- 19 Vercelloni, Julie (2015) Quantifying the state of populations and effects of disturbances at large spatio-temporal scales: the case of coral populations in the Great Barrier Reef. Thesis (PhD) Queensland University of Technology
- 20 Vogel, Nikolas (2015) Understanding individual and combined effects of ocean acidification, warming and coastal runoff on marine calcifying organisms on tropical coral reefs. Thesis (PhD) University of Bremen, Germany
- 21 von Alvensleben, Nicolas (2015) Enhancing microalgal biomass composition for high-value pigment production: reactive oxygen species and carotenogenesis. Thesis (PhD) James Cook University
- 22 White, James Ryan (2016) The role of proximate vs. ecological factors in shaping behavioural syndromes in coral reef fishes. Thesis (PhD) James Cook University
- 23 Yates, Peter (2015) Diversity in shark nursery area function in the Great Barrier Reef. Thesis (PhD) James Cook University.

Master of Science (MSc)

- 1 Civiello, Michael (2015) Use of stable isotope probing to elucidate the etiology of black band disease in corals. Thesis (MSc) James Cook University
- 2 Douglas, Amy (2015) Behavioural interaction between sea snakes and sharks co-occurring on baited video footage. Minor project Thesis (MSc) James Cook University
- 3 Kelly, Joseph B (2015) Application of a molecular phylogenetic approach aiming to establish taxonomic, phylogenetic and phylogeographic relationships of australian sponges preserved at the AIMS Bioresources Library. Thesis (MSc) James Cook University
- 4 Kuret, Anton (2015) Spatial and temporal variability of sea surface temperature in the leeuwin current system from coral paleoclimatology. Thesis (MSc) University of Western Australia
- 5 O'Brien, Paul (2015) CO₂ seeps have little influence on the bacterial communities associated with pH-tolerant reef-building corals. Thesis (MSc) James Cook University
- 6 Wilkinson, Adam (2015) Effects of herbicides on seagrass. Thesis (MSc) James Cook University.

Appendix 2. External committees and non-government organisations and positions

International forums

Arafura Timor Seas Ecosystem Action (ATSEA): Scientific Steering Committee

Arafura Timor Seas Expert Forum (ATSEF): Steering Committee

Association of Official Analytical Chemists (AOAC): Presidential Task Force on Marine and Freshwater Toxins

Blue Carbon Indonesia, Agency for Fisheries and Marine Affairs: Scientific Advisory Committee

Blue Carbon Initiative, Intergovernmental Oceanographic Commission/Conservation International/International Union for Conservation of Nature: Scientific Advisory Committee

Global Environment Fund: Coral Disease Working Group

Global Ocean Observing System (GOOS): Steering Committee, Co-Chair

Global Reporting and Assessment of the State of the Marine Environment (Regular Process), United Nations Oceans & Law of the Sea: Pool of Experts

Great Barrier Reef Foundation: International Scientific Advisory Committee (ISAC)

Great Barrier Reef Foundation: Coral Genomics Consortium, representative on Coral Genomics Advisory Panel to the GBRF International Advisory Panel

International Union for Conservation of Nature (IUCN): Shark Specialist Group, Vice-Chair for Strategy

Intergovernmental Panel on Climate Change (IPCC): Working Group on Coastal Wetlands

IPCC: Greenhouse Gas Inventories Task Group

International Congress on Fish Telemetry: Committee Member

International Oceanographic Commission: Intergovernmental Panel on Harmful Algal Blooms, Australian representative

International Society for Microbial Ecology (ISME): International Board Member

Marine Global Earth Observations (GEO)

Ocean Acidification Expert Review Committee, United Nations Convention on Biological Diversity

Ocean Tracking Network (Canada): Scientific Advisory Committee

Save Our Seas Foundation: Conservation and Science Advisory Panel

Scientific Committee on Oceanic Research (SCOR), Australian delegate

Wildlife Trust of India: Scientific Advisory Committee

National forums

AIMS@JCU: Management Committee

AIMS@JCU: Scientific Advisory Committee

Antarctic Research Assessment Committee (ARAC): Life Sciences, Chair

Antarctic Science Advisory Committee (ASAC)

ANZLIC Marine Community Profile Metadata Standards: Governance Committee

Arafura Timor Research Facility (ATRF): Governance Group

Australian Government Department of the Environment: Reef 2050 Plan Independent Expert Panel

Australian Government Department of the Environment: Threatened Species Scientific Committee

Australian Hydrographic Office, RAN: Permanent Committee on Tides and Mean Sea Level

Australian Lions Foundation for Medical Research into Species of Medical Importance to Humans: Scientific Advisory Committee

International Indian Ocean Expedition-2: Australian National Committee

Australian Ocean Data Centre Joint Facility

Australian Research Council (ARC) Centre of Excellence for Mathematical and Statistical Frontiers: Big Data, Big Models, New Insights: Governance Advisory Board

ARC Centre of Excellence for Coral Reef Studies: Advisory Board

ARC Centre of Excellence for Coral Reef Studies: Scientific Management Committee

CATAMI Classification Scheme: Adviser on sponge growth forms for benthic surveys

Chevron Australia Pty Ltd: Gorgon Marine Turtle Expert Panel, Independent expert (Ministerial appointment)

Chevron Australia Pty Ltd: Dredging Technical Advisory Panel (DTAP) (Commonwealth expert panel)

Coral Reef Environmental Observatory Network (CREON): Co-Chair

Darwin Harbour Advisory Committee (DHAC)

Darwin Harbour Integrated Monitoring and Research Program (IMRP): Coordination Committee

Darwin Harbour LNG development: INPEX Ichthys Project Dredging Expert Panel (IPDEP)

Darwin Marine Supply Base: Taskforce Advisory Group

eReefs: Board

eReefs: Operations Committee

eReefs: User Reference Group

Fisheries Research and Development Corporation (FRDC): National Research Providers Network, Fishing and Aquaculture Research, Development and Extension Strategy

FRDC: Physical Oceanographic influences on Queensland reef fish and scallops, 2013–2015 Steering Committee

Fitzroy Partnership for River Health: Science Panel

Great Barrier Reef Marine Park Authority (GBRMPA) and Queensland Government: Reef 2050 Integrated Monitoring and Reporting Program (RIMReP)

GBRMPA: Crown-of-thorns starfish Advisory Committee

GBRMPA: Ecosystem Reef Advisory Committee (ERAC)

GBRMPA Reef Integrated Monitoring and Reporting Network: Design Working Group

GBRMPA Reef Water Quality Protection Plan: Project Committee

Gladstone Healthy Harbour Partnership (GHHP): Management Committee

GHHP: Science Panel

Great Barrier Reef Coastal Experts Advisory Committee

Great Barrier Reef Foundation: Biophysical Technical Advisory Group

Great Barrier Reef Foundation: Coral Genomics Consortium, representative on Coral Genomics Advisory Panel to the GBRF International Advisory Panel

Healthy Waterways Alliance, Mackay–Whitsunday: Ecosystem Water Quality Think Tank

Integrated Marine Observing System (IMOS): Advisory Committee for the Australian Animal Tagging and Monitoring System

IMOS: Australian National Moorings Network Facility

IMOS: Facility for Automated Intelligent Monitoring of Marine Systems (FAIMMS)

IMOS: National Reference Station Scientific Steering Committee

IMOS: Satellite Remote Sensing Facility

IMOS: Board

IMOS: Steering Committee

James Cook University School of Business: Industry Advisory Panel

Kakadu Research Advisory Committee

Mackay–Whitsunday Healthy Rivers to Reef Report Card: Technical Working Group

Marine National Facility: Future Research Vessel Technical Advisory Group

Marine National Facility Steering Committee (MNFSC)

National Environmental Research Program (NERP) Marine Biodiversity Hub: Steering Committee

NERP Marine Biodiversity Hub: Theme Leader

NERP Tropical Ecosystems Hub: Steering Committee

NERP Tropical Ecosystems Hub: Science Leader

NERP Tropical Ecosystems Hub: GBR Biodiversity Implementation Group

NERP Tropical Ecosystems Hub: Torres Strait Implementation Group

NERP Tropical Ecosystems Hub: Water Quality Implementation Group

National Environmental Science Programme (NESP) Marine Biodiversity Hub: Partners Committee

NESP Tropical Water Quality Hub: Science Advisory Committee

National Marine Science Committee (NMSC): Chair

National Strategic Rural Research and Development Investment Plan

North Australian Marine Research Alliance (NAMRA): Director

NAMRA: Steering Committee

Northern Research Futures Collaborative Research Network (CRN): Partners' Management Committee

Northern Research Futures CRN: Scientific Advisory Committee

Organisation for Economic Co-operation and Development (OECD): Test Guideline Committee

Queensland Integrated Marine Observing System (Q-IMOS): Node Leader

Q-IMOS: Technical Reference Group

Queensland Government: Great Barrier Reef Water Science Taskforce

Queensland Government: Marine Stinger Advisory Committee, Research Working Group

Reef 2050 Advisory Committee

Reef and Rainforest Research Centre Pty Ltd: Board of Directors

Reef Water Quality Protection Plan: Independent Science Panel

Torres Strait Scientific Advisory Committee

Western Australian Integrated Marine Observing System (WAIMOS): Scientific Reference Group

Western Australian Marine Science Institution (WAMSI): Board

WAMSI: Governor

WAMSI: Node Leader Science

WAMSI: Research and Development Committee

Appendix 3. Legislative foundation and ministerial powers

Enabling legislation

The Australian Institute of Marine Science is a corporate Commonwealth entity, established on 9 June 1972 by the *Australian Institute of Marine Science Act 1972* (AIMS Act).

Functions of the Institute

(1) The functions of the Institute are:

- (a) to carry out research and development in relation to:
 - i) marine science and marine technology; and
 - ii) the application and use of marine science and marine technology; and
- (b) to encourage and facilitate the application and use of the results of research and development of that kind; and
- (c) to arrange for carrying out research and development of that kind; and
- (d) to cooperate with other institutions and persons in carrying out research and development of that kind; and
- (e) to provide any other institution or person with facilities for carrying out research and development of that kind; and
- (f) to collect and disseminate information relating to:
 - i) marine science and marine technology; and
 - ii) the application and use of marine science and marine technology; and, in particular, to publish reports and other papers; and
- (g) to produce, acquire, provide and sell goods, and to provide services, in connection with:
 - i) marine science and marine technology; and
 - ii) the application and use of marine science and marine technology; and
- (h) to make available to other persons, on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Institute; and
- (i) to do anything incidental or conducive to the performance of any of the functions in paragraphs (a) to (h).

Powers of the Institute

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

- (a) to enter into contracts;
- (b) to 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) to purchase or take on lease land or buildings, and to erect buildings, necessary for the purposes of the Institute;
- (d) to dispose of, or grant leases of, land or buildings vested in the Institute;
- (e) to 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) to participate in partnerships, trusts, unincorporated joint ventures and other arrangements for sharing profits;
- (g) to subscribe for and to purchase shares in, and debentures and other securities of, companies;
- (h) to form, and to participate in the formation of, companies;
 - (ha) to lend money to associated companies of the Institute;
 - (hb) with the written approval of the Finance Minister, to provide guarantees for the benefit of associated companies of the Institute;
- (i) to appoint agents and attorneys, and to act as agents for other persons;
- (j) to 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) to arrange for displaying material and giving lectures, to the public or otherwise, about:
 - (i) marine science and marine technology; and
 - (ii) the application and use of marine science and marine technology.

Ministerial powers of direction

Under section 10 (1) of the AIMS Act, the responsible Minister (and Finance 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 (sections 13, 16(b)),
2. Appointing (and terminating such appointment) a person to act as Chairperson (sections 17(1) and (3)),
3. Appointing (and terminating such appointment) a person to act as a member of Council (sections 17(2) and (3));

4. Convening a meeting of Council (section 20(2));
5. The Finance Minister may give directions at any time as to amount and moneys to be paid to the Institute (section 36(2));
6. Out of money appropriated by the Parliament for the purpose, the Finance Minister has power to lend money to the Institute (section 42A);
7. The Finance Minister has the power to provide written approval for the Institute to borrow money from persons other than the Commonwealth (section 42B);
8. The Finance Minister has the power to guarantee borrowings of the Institute (section 42C)
9. Appointing a Committee to assist Council and approving the terms and conditions of members (section 45)
10. Delegation of powers by Finance Minister (section 50)

(1) The Finance Minister may, by written instrument, delegate to an official (within the meaning of the *Public Governance, Performance and Accountability Act 2013*) of a non-corporate Commonwealth entity (within the meaning of that Act) the power:

- (a) to approve the provision of guarantees as mentioned in paragraph 10(2)(hb); or
- (b) to approve the borrowing of money on terms and conditions specified in, or consistent with, the approval as mentioned in subsection 42B(1); or
- (c) to enter into contracts as mentioned in subsection 42C(1); or
- (d) to make determinations as mentioned in subsection 42C(2).

(2) In exercising power under a delegation, the official must comply with any directions of the Finance Minister.

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Abbreviations

Abbreviation	Description
AFP	Australian Federal Police
AICD	Australian Institute of Company Directors
AIMS	Australian Institute of Marine Science
AIMS Act	<i>Australian Institute of Marine Science Act 1972</i>
ANAO	Australian National Audit Office
ANU	Australian National University
AOAC	Association of Official Analytical Chemists
AODN	Australian Ocean Data Network
ARAC	Antarctic Research Assessment Committee
ARC	Australian Research Council
ASIC	Australian Securities and Investments Commission
ATRF	Arafura Timor Research Facility
ATSEA	Arafura Timor Seas Ecosystem Action
ATSEF	Arafura Timor Seas Expert Forum
CAC Act	<i>Commonwealth Authorities and Companies Act 1997</i>
CDU	Charles Darwin University
CFO	Chief Finance Officer
CO ₂	carbon dioxide
COO	Chief Operating Officer
Coral CoE	ARC Centre of Excellence for Coral Reef Studies
CPSU	Community and Public Sector Union
CREON	Coral Reef Environmental Observatory Network
CRN	Collaborative Research Network
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPaW	Western Australian Department of Parks and Wildlife
DTAP	Dredging Technical Advisory Panel
EAP	Employee assistance program
EEO	Equal employment opportunity
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FAICD	Fellow of the Australian Institute of Company Directors
FAIM	Fellow of the Australian Institute of Management
FAIMMS	Facility for Automated Intelligent Monitoring of Marine Systems

Abbreviation	Description
FACE	Fellow of the Australian College of Educators
FASSA	Fellow of the Academy of the Social Sciences in Australia
FCA	Fellow of the Institute of Chartered Accountants in Australia
FOI	Freedom of information
FOI Act	<i>Freedom of Information Act 1982</i>
FQA	Fellow of the Queensland Academy of Arts and Sciences
FRDC	Fisheries Research and Development Corporation
FRR	Financial Reporting Rule
FTE	Full-time equivalent
FTI	Fellow of The Tax Institute of Australia
FTSE	Fellow of the Australian Academy of Technological Sciences and Engineering
GAICD	Graduate of the Australian Institute of Company Directors
GBR	Great Barrier Reef
GBRF	Great Barrier Reef Foundation
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GHHP	Gladstone Healthy Harbour Partnership
GMO	Genetically modified organism
GOOS	Global Ocean Observing System
IMOS	Integrated Marine Observing System
IOMRC	Indian Ocean Marine Research Centre
IPCC	Intergovernmental Panel on Climate Change
IPS	Information Publication Scheme
ISI	Institute for Scientific Information
ISME	International Society for Microbial Ecology
IUCN	International Union for Conservation of Nature
JCU	James Cook University
LNG	Liquefied natural gas
LTMP	Long-Term Monitoring Program
MMP	Marine Monitoring Program
NAMRA	North Australia Marine Research Alliance
NCRIS	National Collaborative Research Infrastructure Strategy
NERP	National Environmental Research Program
NESP	National Environmental Science Programme

Abbreviation	Description
NLRD	Notifiable low risk dealing
NMSC	National Marine Science Committee
OECD	Organisation for Economic Co-operation and Development
PBS	<i>Portfolio Budget Statement</i>
PGPA Act	<i>Public Governance, Performance and Accountability Act 2013</i>
Q-IMOS	Queensland's Integrated Marine Observing System
RIMReP	Reef 2050 Integrated Monitoring and Reporting Program
RV	Research vessel
SCOR	Scientific Committee on Oceanic Research
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UQ	University of Queensland
UTAS	University of Tasmania
UWA	University of Western Australia
WA	Western Australia
WAIMOS	Western Australian Integrated Marine Observing System
WAMSI	Western Australian Marine Science Institution

Index of annual report requirements

AIMS' requirement for annual reporting is outlined under s. 7 (2) of the AIMS Act, where it states 'The *Public Governance, Performance and Accountability Act 2013* applies to the Institute. That Act deals with matters relating to corporate Commonwealth entities, including reporting and the use and management of public resources'.

The index below shows AIMS' compliance with annual report information requirements for corporate Commonwealth entities as stipulated under s. 46 of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

The annual financial statements (see page 95) were prepared in accordance with ss. 42 and 43 of the PGPA Act and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*.

This annual report complies with parliamentary standards of presentation and printing, and uses plain English and clear design.

Annual report (AR) content requirements	Source(s)	Where in annual report
General		
The accountable authority (AA) of an entity must prepare and give an annual report to the responsible Minister.	S 46(1) PGPA Act	AIMS Annual Report 2015–16
Public Governance, Performance and Accountability Amendment (Corporate Commonwealth Entity Annual Reporting) Rule 2016 (CCEAR Rule)		
The AR must be approved and signed by the AA, and include details of how and when approval was given. It must state that the AA is responsible for preparing and delivering the AR in accordance with the section 46 of the PGPA Act.	S 17BB CCEAR Rule	Letter of transmittal: page v
The AR must comply with the guidelines for presenting documents to the Parliament.	S 17BC CCEAR Rule	AIMS Annual Report 2015–16
The AR must be prepared having regard to the interests of the Parliament and any other persons who may be interested in it.	S 17BD CCEAR Rule	AIMS Annual Report 2015–16

Annual report (AR) content requirements	Source(s)	Where in annual report
The AR must specify the entity's enabling legislation, including a summary of the entity's objects and functions and the purposes of the entity as included in the entity's CP.	SS 17BE(a)–(b) CCEAR Rule	Role and legislation: page 73 Entity purpose: page 30 Intended outcomes: page 30 Appendix 3. Legislative foundation and ministerial powers: page 155 Objects, functions and purpose are also described on page 4 of AIMS' <i>Corporate Plan 2015–16</i>
The AR must specify the name and title of the responsible Minister(s).	S 17BE(c) CCEAR Rule	Responsible minister: page 74
The AR must provide details of: <ul style="list-style-type: none"> any directions issued by any Minister under an Act or instrument during the period; any government policy orders that applied to the entity under section 22 of the PGPA Act; and particulars of non-compliance with any of the above directions or orders. 	SS 17BE(d)–(f) CCEAR Rule	Ministerial directions and statutory requirements: page 74 General policies of the Australian Government: page 74 Particulars of non-compliance: n/a
The AR must include annual performance statements in accordance with paragraph 39(1)(b) of the PGPA Act and section 16F of the PGPA Rule.	S 17BE(g) CCEAR Rule	Performance statement: starts page 29
The AR must include a statement of any significant issue reported to the responsible Minister under paragraph 19(1)(e) of the PGPA Act that relates to non-compliance with the finance law in relation to the entity.	SS 17BE(h)–(i) CCEAR Rule	Fraud control: page 81 Duty to inform and Ministerial notifications: page 83
The AR must include information about the AA(s), including names, qualifications, experience, attendance of board meetings and executive status.	S 17BE(j) CCEAR Rule	Council members: page 75

Annual report (AR) content requirements	Source(s)	Where in annual report
<p>The AR must include an outline of the:</p> <ul style="list-style-type: none"> organisational structure of the entity (including subsidiaries); and location of major activities and facilities of the entity. 	<p>SS 17BE(k)–(l) CCEAR Rule</p>	<p>Organisational structure: page 90</p> <p>Location of AIMS' major activities and facilities: page 2</p>
<p>The AR must include information on the main corporate governance practices used by the entity, including, for example, details of:</p> <ul style="list-style-type: none"> board committees and their main responsibilities; education and performance review processes for the AA; and, ethics and risk management policies. 	<p>S 17BE(m) CCEAR Rule</p>	<p>Corporate governance: starts page 75</p>
<p>The AR must disclose the decision-making process undertaken by the board in relation to transactions with other entities or if the transaction is more than \$10 000 (inclusive of GST).</p>	<p>SS 17BE(n)–(o) CCEAR Rule</p>	<p>Financial reporting: page 82</p>
<p>The AR must detail any significant activities and changes that affected the operations or structure, for example:</p> <ul style="list-style-type: none"> significant events such as forming or participating in the formation of a company, partnership etc.; operational and financial results; key changes to its status of affairs or principal activities; or, amendments to enabling legislation or any other legislation directly relevant to its operation(s). 	<p>S 17BE(p) CCEAR Rule</p>	<p>Significant events: n/a</p> <p>Operational results: Performance statement: starts page 29</p> <p>Financial results: starts page 95</p> <p>Changes in status: n/a</p> <p>Amendments to legislation: n/a</p>

Annual report (AR) content requirements		Source(s)	Where in annual report
	<p>The AR must include details of third party reviews, including:</p> <ul style="list-style-type: none"> judicial decisions or decisions of administrative tribunals made during the period that have had, or may have, a significant effect of the operations of the entity; and the particulars of any report on the entity given during the period by the Auditor-General (other than one made under section 43 of the PGPA Act), a Parliamentary Committee, Commonwealth Ombudsman or the Office of the Australian Information Commissioner. 	SS 17BE(q)–(r) CCEAR Rule	Judicial decisions and reviews by outside bodies: page 84
	The AR must include an explanation if information is missing from a subsidiary that is required to be included in the annual report, and state the effect of not having the information in the AR.	S 17BE(s) CCEAR Rule	n/a
	The AR must include details of any indemnity that applied during the period to the AA, any member of the AA or officer of the entity against a liability (including premiums paid, or agreed to be paid, for insurance against the officer's liability for legal costs).	S 17BE(t) CCEAR Rule	Indemnities and insurance premiums for officers: page 83
	The AR must provide an index of annual report requirements identifying where relevant information can be found in the annual report.	S 17BE(u) CCEAR Rule	Index of annual report requirements: page 163
Performance statement			
	The AA must measure and assess the performance of an entity in achieving its purpose(s) in the single reporting period.	SS 38, 39(1) PGPA Act	Performance statement: starts page 29

Annual report (AR) content requirements	Source(s)	Where in annual report
<i>Performance statement (PS)—Statement of preparation</i>		
<p>The PS must include a statement:</p> <ul style="list-style-type: none"> • declaring that the PSs are prepared for s 39(1)(a) of the PGPA Act and any other applicable legislation; • specifying the reporting period for which the PSs are prepared; and • declaring that, in the opinion of the AA, the PSs accurately present the entity's performance and comply with s 39(2) of the PGPA Act. 	S 16F(2) PGPA Rule	Statement of preparation: page 29
<i>Performance statement—Results</i>		
The PS must include the results of the measurement and assessment of performance.	S 16F(2) PGPA Rule	<p>Performance statement: starts page 29</p> <p>Overall performance summary: page 33</p> <p>AIMS' performance against 2015–16 Research Goals: page 37</p>
<i>Performance statement—Analysis</i>		
<p>The PS must include an analysis of the facts that contributed to the entity's performance, including any changes to:</p> <ul style="list-style-type: none"> • the entity's purpose, activities or organisational capacity; or • the environment in which the entity operated that may have had a significant impact on performance. 	S 16F(2) PGPA Rule	Performance statement: starts page 29
Financial statement (FS)		
The AA must prepare annual financial statements and give them to the Auditor-General.	S 42(1) PGPA Act	Financial statements: page 95
The AA must ensure that all the subsidiaries' financial statements are audited by the Auditor-General.	S 44(2) PGPA Act	n/a

Annual report (AR) content requirements		Source(s)	Where in annual report
	A copy of the FS and the Auditor-General's report must be included in the AR.	S 43(4) PGPA Act	Financial statements: page 95 Independent Auditor's report: page 96
	The FS must comply with the Public Governance, Performance and Accountability (Financial Reporting) Rule 2015.	S 42(2)(a) PGPA Act	Financial statements: page 95
Other requirements			
Statement of Expectations			
To reduce any reporting burden it may be useful for the AR to address any Statement of Expectations issued by the Minister, with reference to any subsequent Statement of Intent.		Suggested practice	Ministerial directions and statutory requirements: page 74
<i>Environment Protection and Biodiversity Conservation Act 1999</i>			
The AR must include: <ul style="list-style-type: none"> • a report on how the activities accorded with the principles of ecologically sustainable development; • identify how the outcomes (if any) specified for the reporter in an Appropriations Act relating to the period contribute to ecologically sustainable development; • document the effect of the reporter's activities on the environment; • identify any measures the reporter is taking to minimise the impact of activities by the reporter on the environment; and, • identify the mechanisms (if any) for reviewing and increasing the effectiveness of those measures. 		S 516A(6) EPBC Act; DEWHA <i>Guidelines for Section 516A reporting</i>	Environmental performance: page 88

Annual report (AR) content requirements	Source(s)	Where in annual report
<i>Work Health and Safety Act 2011</i>		
<p>Corporate entities established for a public purpose must include, in their ARs:</p> <ul style="list-style-type: none"> • initiatives taken during the year to ensure the health, safety and welfare of workers who carry out work for the entity; • health and safety outcomes (including the impact on injury rates of workers) achieved as a result of initiatives mentioned under paragraph (a) or previous initiatives; • statistics of any notifiable incidents of which the entity becomes aware during the year that arose out of the conduct of businesses or undertakings by the entity; • any investigations conducted during the year that relate to businesses or undertakings conducted by the entity, including details of all notices given to the entity during the year under Part 10 of this Act; and • such other matters as are required by guidelines approved on behalf of the Parliament by the Joint Committee of Public Accounts and Audit. 	Sch 2, pt 4, 4(1) WHS Act	Health and safety: page 86
<i>National Disability Strategy 2010–2020</i>		
The Department of Prime Minister and Cabinet (PMC) AR guidelines provide standard words to be included regarding disability reporting mechanisms.	<i>PMC Requirements for Annual Reports</i>	Disability strategy: page 94
<i>Freedom of Information Act 1982—Information Publication Scheme</i>		
The PMC guidelines provide some standard words to be included in the annual report (for the 2014–15 financial year), reiterating the purpose of the Information Publication Scheme.	<i>PMC Requirements for Annual Reports</i>	FOI operations: page 85

Annual report (AR) content requirements	Source(s)	Where in annual report
<i>Equal Employment Opportunity (Commonwealth Authority) Act 1987</i>		
Each entity is required to prepare a report on 'the development and implementation of its [equal employment opportunity] program'. This need not be included in the AR, but it may be.	S 9 EEO Act	Equal employment opportunity and workplace diversity: page 92

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Australian Government



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