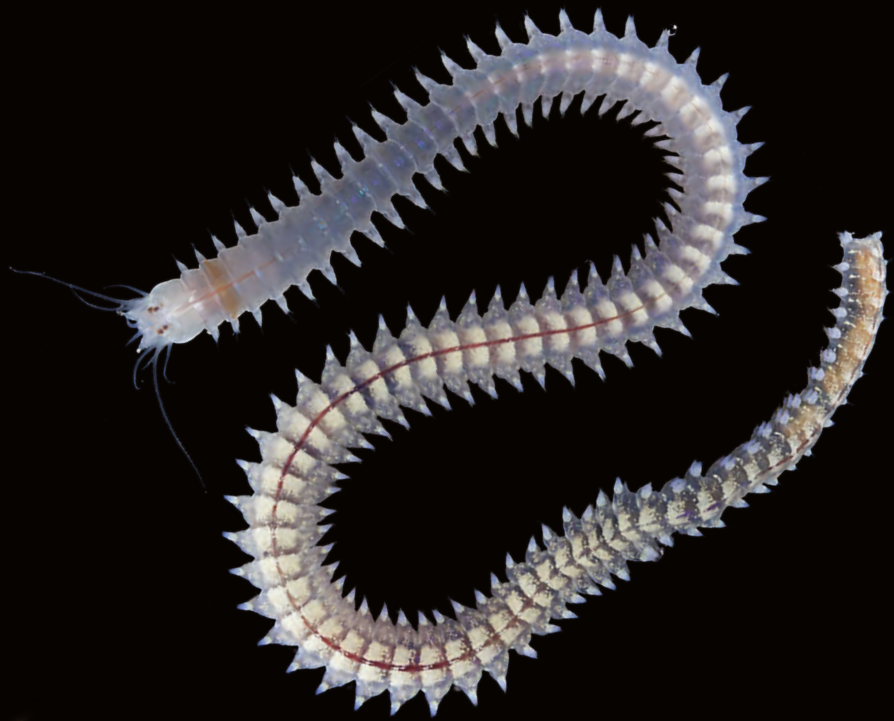
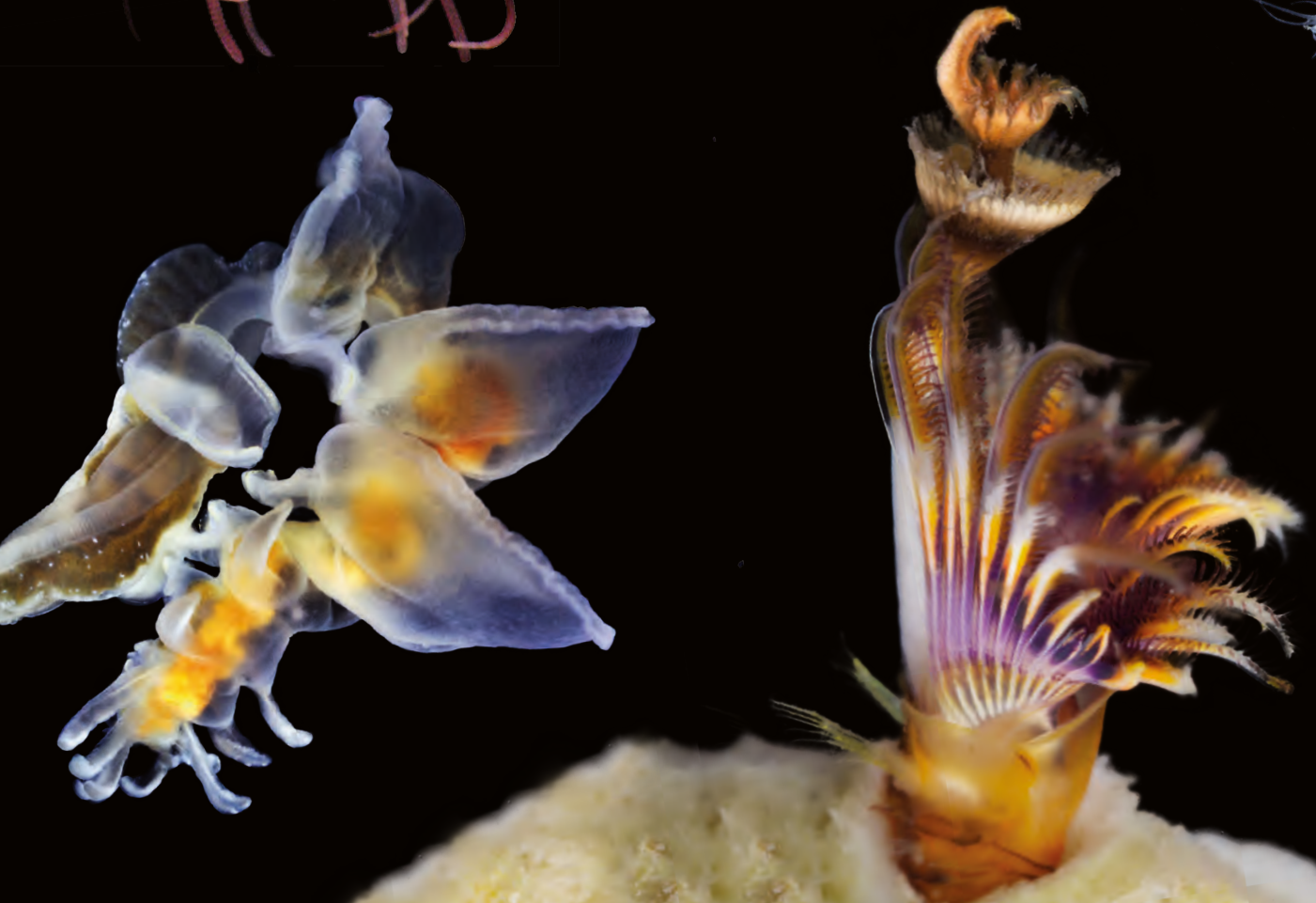
Australian Museum Research Institute

Science Strategy 2017 – 2021





AUSTRALIAN MUSEUM
RESEARCH INSTITUTE

Science Strategy 2017 – 2021 Overview

Our Vision: To be a valued global leader in scientific discovery and conservation

Our Mission:

- To anticipate and answer major scientific questions about our past and our future
- To protect, develop and provide access to our collection for high-quality, high-impact science and community engagement
- To develop community knowledge of and engagement with science

Clouds

- Contempory Discovery
- Impact of Change
- Supporting Australian Industry
- Cultural connections

Enablers

- Science and research infrastructure
- Citizen science
- Expeditions and exploration
- Partnerships
- Talent management

Goals

- Improved value and impact of our science and collection across all clouds
- Development of Flagship initiatives

The Koala Genome Project: historical data and new technologies combine to aid in the conservation of one of Australia's most iconic species.

Photo by Ian Bird © Australian Museum

Our value proposition

In 2017, AMRI had an operating budget of over $9 million and a team of more than 80 scientists and collections officers. We will increase our resourcing and talent acquisition as part of actioning our strategy.

We are an engaging, inspiring and trusted voice on natural and cultural discovery, open and accessible approach is forward-looking, collaborative and underpins understanding of the challenges that are critical to our future world:

- Management of land, water and oceans
- Custodianship and conservation of global biodiversity
- Agriculture and food production
- Energy and resource exploration
- Human health
- Cultural understanding
- Digital transformation

We are a cornerstone of Australia's distributed network of natural and cultural collections. Our collection has over 18 million objects and specimens and is the largest in the southern hemisphere. We were the first museum in our region and have collections from across Australia and the Pacific and Southeast Asia, with particular expertise on New South Wales. Most of our collection is housed in the city of Sydney – Australia's iconic face to the world and gateway to the Asia-Pacific.

We are also a proud part of regional Australia through our collection housed in Canowindra and Bathurst in regional New South Wales, and Lizard Island Research Station in northern Queensland. We respect the role of Indigenous knowledge holders, both here and in the Pacific and strive to work closely with them.

Our citizen science programs are recognised nationally as a gold standard. Our education and outreach programs enable everyone to contribute to the development of science in Australia and promote positive social change.

Our integrative approach encourages a range of scientific techniques backed up by the largest tissue bank and specimen collection in Australia. This sets us apart from other research institutes and gives us and the people who use our collection a unique perspective on the challenges of our future.

Our vision

To be a valued global leader in scientific discovery and conservation

Discovery means exploring our world, documenting new finds, consulting with communities and deepening our understanding through next-generation research that is both foundational and applied.

Our mission

- To anticipate and answer major scientific questions about our past and our future
- To protect, develop and provide access to our collection for high-quality, high-impact science and community engagement
- To develop community knowledge of and engagement with science

Undertaking our mission

Science Clouds

Our work is prioritised into areas where we can have the greatest impact. These priority areas enable our people and people who use our collection to work across fields in a cloud environment – scanning and foresighting, sharing resources, ideas and information, and innovating across fields and disciplines to drive scientific and cultural discoveries and public engagement.

Contemporary discovery

This cloud relates to new species discoveries and undescribed diversity, the spatial and genetic distributions of animals and the interactions of animals in different ecosystems. It includes the development of animals, ecosystems, landscapes and earth through time, as well the cultural factors that affect how people value, understand and engage with biodiversity and ecosystems. An important part of contemporary discovery is engagement with communities, including Indigenous peoples here in Australia and in the Pacific, to learn about their broad knowledges.

Cultural connection: Skilfully made obsidian tool replicas from AMRI enable scientists and communities to benefit from and enjoy significant archaeological discoveries.

Photo by Rocky Roe © Hargy Oil Palm Plantation

Impacts of change

This cloud relates to the impacts of processes including climate change, earth processes, human induced change, invasive animals and plants, and natural disasters. It includes the past and future impacts of climate and environmental change on societies and cultural diversity in Australia and the Pacific region, and predicting the potential effects of development and environmental change on ancient and living heritage. It also includes work on minerals in caves as climate data 'time vaults'. An important part of this cloud is research on animals of Australian and international conservation concern to support effective conservation management.

Supporting Australian industry

This cloud relates to opportunities for industry, such as the 'blue economy' and species of value to the fishing industry, geological information supporting the resources sector and mineralogy studies supporting the construction industry. It also includes supporting industry to face challenges, including biosecurity threats to agriculture, forestry, and fishing and threats to the aviation industry of wildlife strike. An important part of this cloud is international biosecurity capacity building.

Cultural connections

This cloud relates to the diverse ways societies have actively created and interrelated with their natural and cultural environments over time. It focuses on human perceptions, impacts and ways of living within these environments, particularly within the Australia and Pacific region. We respectfully value the contribution of the knowledge of Aboriginal and Torres Strait Islander peoples, as well as the people of the Pacific to this cloud. Activities centre around engagement with and partnering with communities to deepen cultural understandings, particularly centred on the Australian Museum's collection. Research foci include tangible and intangible cultural heritage (including performance, arts practice and language) and the interrogation of museums in contemporary society, their role and responsibilities in helping people to engage with and respond to the challenges of our changing world in a manner that values diversity, respects cultural norms and explores ways to support respectful engagement.

Enablers

A suite of enabling activities supports work across all science clouds.

Science and research infrastructure

Our collection infrastructure is a reference tool for understanding the biodiversity, geodiversity and cultural diversity of Australia and neighbouring regions. It also provides community access, information and material for educational and display purposes. We develop, refine and care for our collection and associated information to provide a resource in perpetuity for high impact research. Digital technology provides opportunities for engaging more stakeholders in the research on and exploration of our collection. The collection is housed in Sydney, at the Australian Fossil and Mineral Museum in Bathurst and at the Age of Fishes Museum in Canowindra.

Our other facilities are state-of-the-art infrastructures that support priority science areas. They include:

- the Australian Centre for Wildlife Genomics and our frozen tissue collection, which delivers molecular and imaging data of the highest quality and provides essential services in DNA identification and genomics-based research. The Centre is one of the few laboratories to have attained National Association of Testing Authorities accreditation for wildlife forensic work in the region.
- the Collection Informatics and Imaging Unit, which works to deliver our vast collection data to large national and global information initiatives
- the Lizard Island Research Station, our internationally acclaimed marine research station located on the northern Great Barrier Reef.

Citizen science

The museum has been an Australian pioneer in citizen science, long providing opportunities for anyone who wants to make a difference through science. Today, the Australian Museum Centre for Citizen Science oversees and coordinates our efforts. Our programs highlight our scientific investigations, examine contemporary issues for which science can provide solutions and inspire our audiences to contribute. We use a range of learning approaches and support face-to-face interactions and digital initiatives to inform and create an environment that stimulates curiosity and motivates learning.

The Solomon Islands Expedition: working closely with communities to search for ecologically and culturally significant mammals in the region.

Photo by Tyrone Lavery © Australian Museum

Expeditions and exploration

Expeditions have both a historical and a contemporary scientific and cultural significance to the Australian Museum. They are an important part of keeping a dynamic and relevant collection and of engaging the public in our mission. More broadly, our team regularly conducts field work to support our science, cultural research, and build our collection.

Partnerships

Collaboration adds the crucial dimension required to address the challenges and opportunities of our future. Deepening and expanding our existing partnerships and driving new partnerships will be key to our success in helping to address these challenges. The museum's nationally and internationally recognised collections and expertise provide us with opportunities to collaborate widely – with other research institutions and governments, natural resource and biosecurity managers, industry groups, non-government organisations, Indigenous peoples, strategic communicators and the wider community.

Talent management

Many of our team are world experts. Our strength lies in their ability to apply their expertise and integrity in a range of disciplines to manage our collection and tackle scientific questions in novel and exploratory ways. Our staff and honorary appointees also bring science and cultural understandings to the community, inspire curiosity and passion for our shared planet and spark conversations about the future through exhibitions, learning programs and a range of media channels. Our volunteer and citizen science network means we can undertake science that would otherwise not be possible, building our advocacy base and contributing significant outcomes. The museum's education program helps provide a pipeline of young researchers and citizen scientists.

Our goals and measuring success

Goal 1: Improved value and impact of our science and collection across all clouds

We will improve the value and impact of our science and the use of our collection. We will measure this through:

- Access (use) value: the value of our contribution to the research community and the value of access to and use of our collection and collection infrastructure
- Education value: the value of our science and cultural contributions to educating Australia's research workforce through university teaching and student learning
- Social value: the value of our activities to the community
- Research impact (return on investment): the contribution of our scientific and cultural findings and our collection to the realisation of research impacts, compared to our investment
- Efficiency impact: the extent to which other researchers and users report that our scientific or cultural research or our collection made their work significantly more efficient.

Goal 2: Development of Flagship initiatives

We will work towards a range of large-scale initiatives underpinned by strong external collaborations and partnerships and new resourcing. We will measure our leadership of:

A national citizen science initiative for frog identification (FrogID)
A citizen science project centred upon frog identification and inclusive of all major museums in Australia

A biodiversity survey of Sydney Harbour and surrounds
A survey and monitoring program that uses multiple knowledge systems and provides a scientific framework for citizen science and partnerships with businesses, educators, publicly funded research agencies and non-government organisations

Collecting for a biodiverse future: our collections of 18.4 million natural history specimens spanning 190 years underpins all AMRI science and is one of the most important scientific research infrastructures in Australia.

Photo © Australian Museum

A genomics project to halt Australia's extinction record (Oz Mammals Genomics)
A national project inclusive of all major museums in Australia, investigating Australia's 273 species of mammals at the genomic level and using this for direct conservation application

A world standard collection
A project to use Australian and world's best practice to value and maintain our natural history collection and upgrade our dry entomology, mineralogy and spirit collections

An Asia-Pacific museum research hub
A national hub that takes a leadership role in building museum research capacity and partnerships in the Asia-Pacific region, through research projects, workshops, staff exchanges and education programs

A biosecurity identification service
A hub for authoritative identifications that supports natural resource managers and reduce red tape in global supply chains, complemented by digital crowd-sourcing tools for lower-risk identifications

A centre for cultures and collections
A hub that galvanises research on, and creative engagements with, the Australian Museum's diverse cultural collections.

Our history

Since 1827, the Australian Museum has played a key role in understanding Australia's biodiversity, geodiversity and cultural diversity. Its natural history and cultural collections are accessed by researchers worldwide, leading to many insights into the development of the planet and the life it supports. We respectfully acknowledge our relationship to the Aboriginal people, Torres Strait Islander and Pacific Islanders who have cared for their communities, culture, land, waters and species in the past, present and into the future. Our science benefits from their experience and deep knowledge about the natural world, their ancient traditions and present day practices.

Over the past few years, we have applied our knowledge from research, collections, and science education to help solve some critical issues facing the natural world, in particular biosecurity, the environmental impacts of climate change on cultural and biodiversity and the management of pest species and other biosecurity concerns.

In 2014, the Australian Museum established the Australian Museum Research Institute (AMRI) to provide a stronger cohesive presence in the research world and a vehicle for wider promotion of our scientific work. AMRI brings together science, technical and learning services specialists.

Our Mandate

AMRI conducts its collecting and research under the Australian Museum Trust Act 1975 (NSW), with specific objectives to:

- Propagate knowledge about the natural environment of Australia and to increase that knowledge
- Give particular emphasis to propagating, increasing and applying knowledge in the natural sciences of biology, anthropology and geology

The collection supports a range of research disciplines and research in a range of fields.

Kim McKay AO
Director & CEO, Australian Museum

Dr Rebecca Johnson
Director, Australian Museum Research Institute

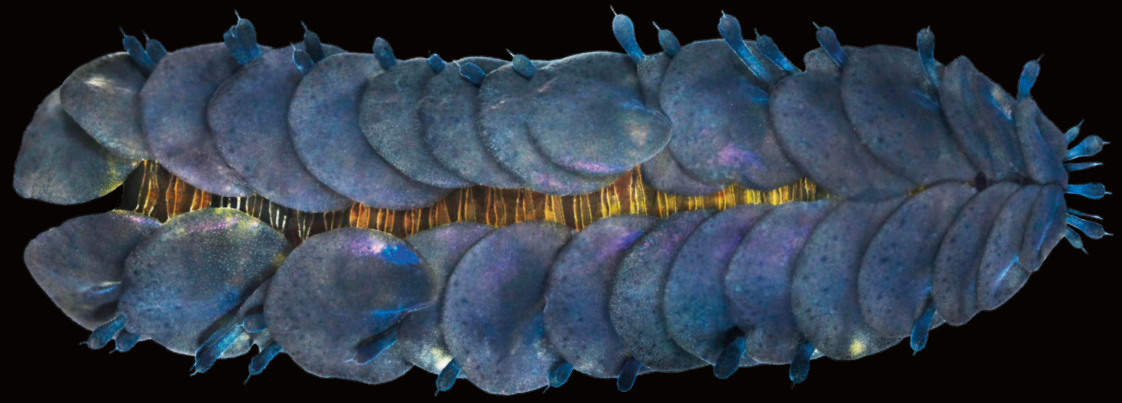
Testing the limits: The epic search for the Lord Howe Island phasmid (*Dryococelus australis*) – the world's rarest insect - on Balls Pyramid.

Photo by Tom Bannigan

The Australian Museum Research Institute (AMRI) is the centre of science and learning at the Australian Museum.

AMRI comprises the Australian Centre for Wildlife Genomics, Australian Museum Centre for Citizen Science, the Lizard Island Research Station, and the museum's natural and cultural collections and research programs.

AMRI operates under the Australian Museum Trust Act 1975.



Australian Museum Research Institute

1 William Street
Sydney NSW 2010
AUSTRALIA

Alexandra Nuttall
T +61 2 9320 6462
E alexandra.nuttall@austmus.gov.au

Cover Photos live seaworm specimens on Lizard Island © Alexander Semenov

Front cover clockwise *Trypanosyllis sp.* (F. Syllidae), *Nereis trifasciata* (F. Nereididae), *Hydroides lirs* (F. Serpulidae), *Chaetopterus sp.* (F. Chaetopteridae)

Back cover clockwise *Lanice viridis* (F. Terebellidae), *Chaetopterus sp.* (F. Chaetopteridae), *Nereis trifasciata* (F. Nereididae), *Gastrolepidia clavigera* (F. Polynoidae)

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