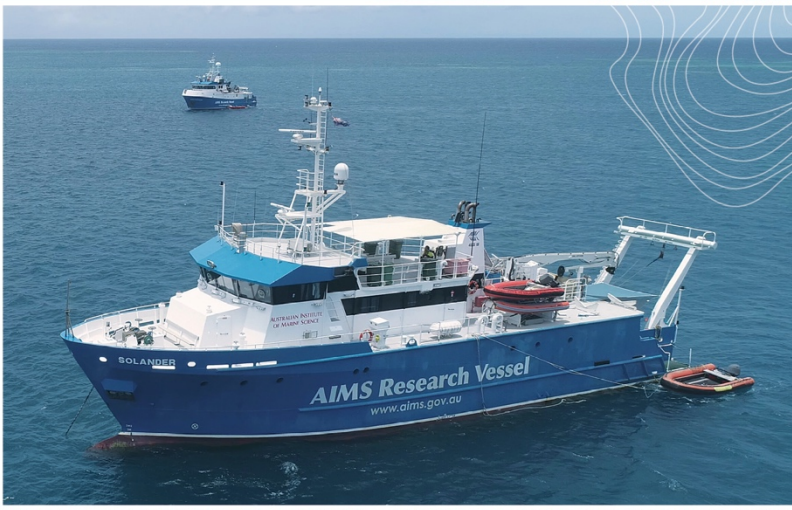
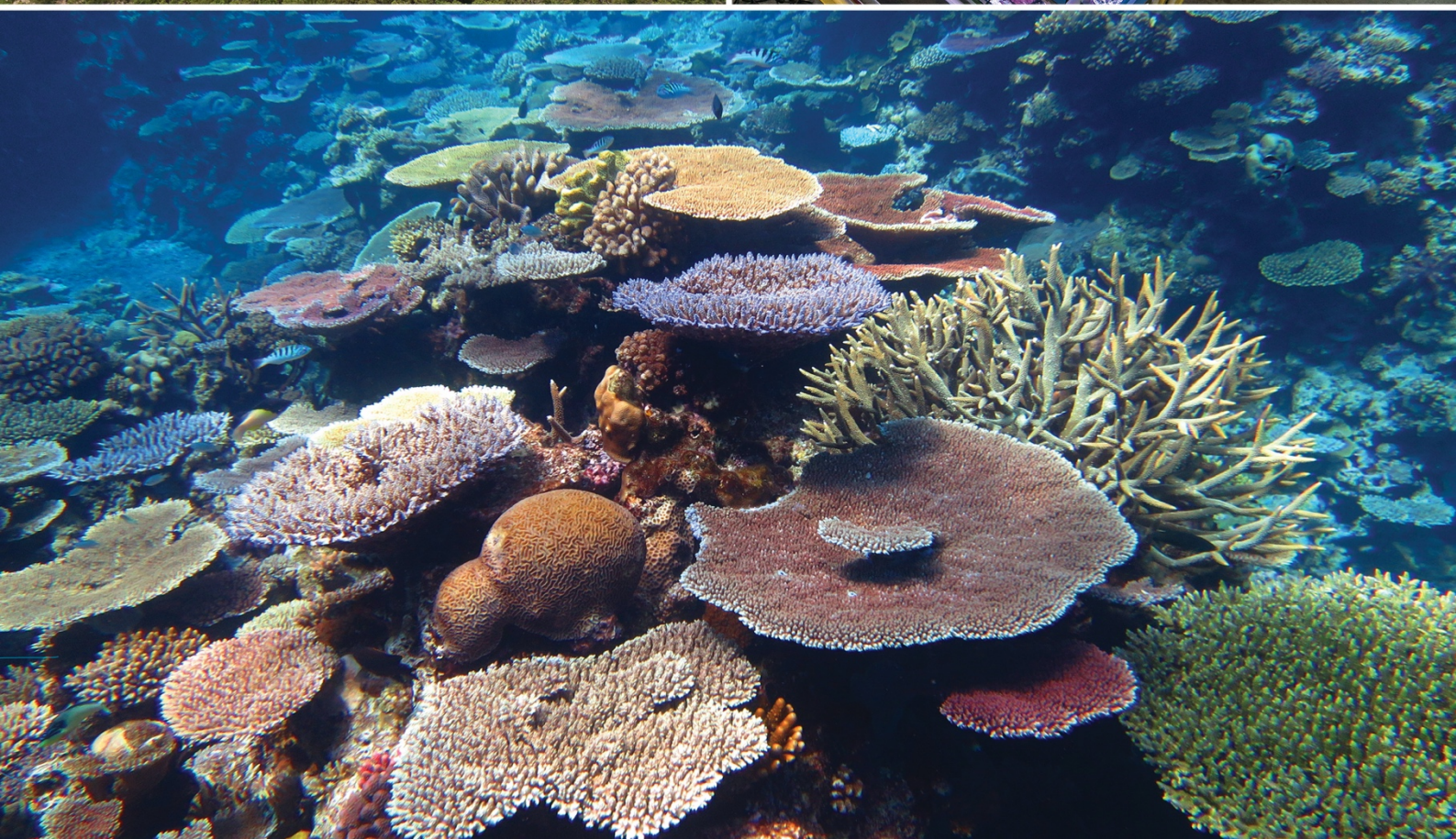
Australian Government

Australian Institute of Marine Science

Postdoctoral Fellowship: Quantitative Decision Science / Operations Research

CANDIDATE INFORMATION PACK





CONTENTS

About AIMS 3

About AIMS' Strategy Development, AIMS Modelling and Decision Support (M&DS) 4

About the Postdoctoral Fellowship: Quantitative Decision Science / Operations Research. 5

How to Apply 6

Key Selection Criteria 7

Position Description 8

About Townsville and Perth 13

The Australian Institute of Marine Science acknowledges the Traditional Owners of the land and sea on which we work. We recognise the unique relationships and enduring cultural and spiritual connection that Aboriginal and Torres Strait Islander people have to land and sea, and pay our respects to Elders past, present and future.

Photographic credits

Cover (Top to bottom): Shaun Hahn, Joe Gioffre, Christian Miller and LTMP
Page 2: Nick Thake
Page 4: David Deeley
Page 6: Steve Clarke
Page 7: Christian Miller
Page 9: Christian Miller
Page 10: Christian Miller
Page 12: Chris Brunner

About AIMS

The Australian Institute of Marine Science is a corporate Commonwealth entity established under the *Australian Institute of Marine Science Act 1972* (AIMS Act). As Australia's tropical marine research agency, it is our mission to provide the research and knowledge of Australia's tropical marine estate required to support growth in its sustainable use, effective environmental management and protection of its unique ecosystems.

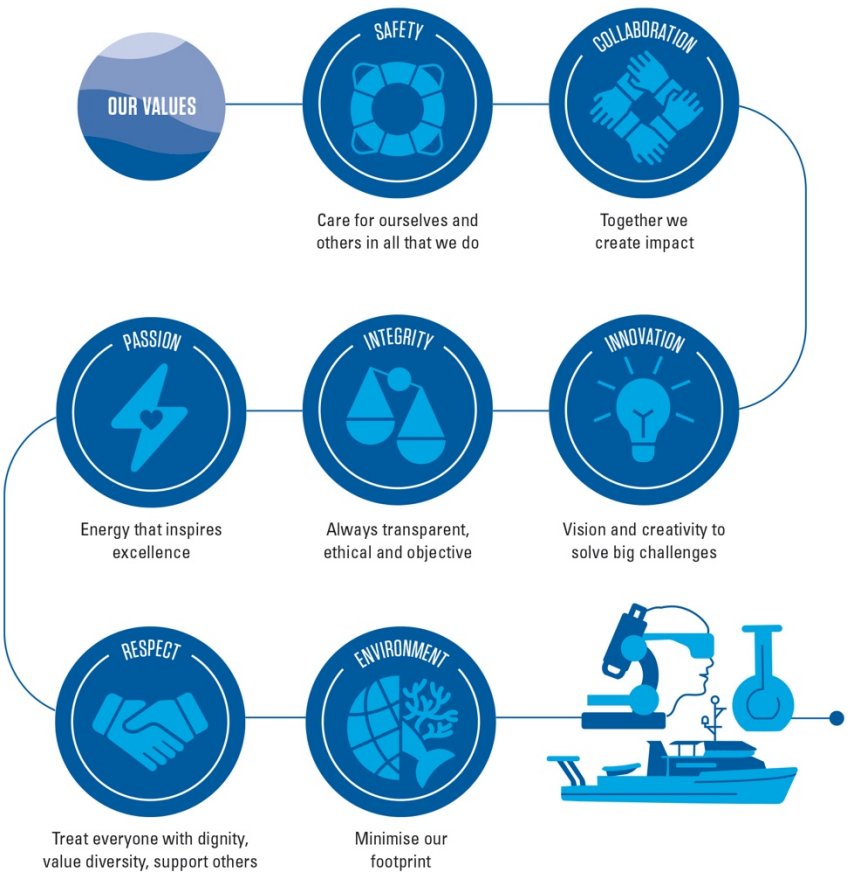
To accomplish our mission, AIMS delivers independent science to help realise three key long-term impacts for the nation:

- Improve the health and resilience of marine and coastal ecosystems across northern Australia.
- Create economic, social and environmental net benefits for marine industries and coastal communities.
- Protect coral reefs and other tropical marine environments from the effects of climate change.

Our research is focused on the priorities of our stakeholders, including Commonwealth, state and territory governments, industry and Traditional Owners. Our research continues to:

- Underpin Australia's environmental management of the Great Barrier Reef (GBR) to ensure that this World Heritage Area remains healthy and resilient.
- Support the sustainable development of coastal industries and ports across northern Australia.
- Provide the environmental baselines and condition and risk assessments required for current and future resource and industrial developments in Northern Australia.

THE WAY WE WORK



About AIMS Programs

AIMS Programs

Australia's marine territory is the third largest on Earth.

By 2025, marine industries will contribute some $100 billion a year to the economy, with oceans and coasts providing a further $25 billion worth of often unrecognised ecosystem services such as carbon dioxide absorption, nutrient cycling and coastal protection.

The National Marine Science Plan 2015–2025 identifies major challenges related to sustainable ocean use into the future. These include maintaining national security, safety, energy and food supplies, protecting biodiversity and ecosystem health, ensuring sustainable coastal development, adapting to climate variability and change, and prioritising resource allocation.

AIMS provides research and knowledge to help meet these challenges, so that governments and industry can make informed decisions about marine management. To this end we collaborate, consult, provide and exchange data and knowledge with Australian and international researchers, stakeholders, Traditional Owners and the wider community.

Through constant innovation, we are finding ways to capture, manage, analyse and share vast amounts of information to better understand how natural and human pressures affect coastal and ocean ecosystems. Our cross-disciplinary teams and cutting-edge infrastructure support wide-ranging experimental programs, integrated observing systems and long-term monitoring, and systems for environmental risk assessment and decision-making support.

The primary focus of our research is to support a resilient Great Barrier Reef, sustainable coastal ecosystems and industries across northern Australia and environmentally sustainable offshore oil and gas development on Australia's North-West Shelf.

AIMS Strategic Development Program

The Strategic Development Program delivers capabilities and projects to position AIMS for the future and to deliver AIMS' Strategy 2025. The Program is home to interdisciplinary teams working across fields of technology development, engineering, decision science, operations research, and complex-systems modelling. All projects are driven by a mission to deliver positive and lasting impacts for Australia's tropical marine ecosystems and for dependent people and industries. The Program's focus is on delivering time-critical solutions at marine science and innovation frontiers.

About the opportunity

Postdoctoral Fellowship: Quantitative Decision Science / Operations Research

The Modelling and Decision Support (M&DS) team provides solution science, which is a strategic growth priority for AIMS by delivering evidence-based science and advice for internal and external customers.

As our Postdoctoral Fellow in Quantitative Decision Science/Operations Research, you will fill the most urgent and critical element of AIMS' capacity development in decision support. You will extend AIMS' modelling capability to help tackle complex decision problems for marine science, management and policy. In this role you will join AIMS' multi-disciplinary team of oceanographic, biological and ecological modellers, and with national and international collaborators in the fields of engineering, economics. business strategy and social sciences. You will do so by integrating advanced quantitative and analytical decision analyses (mathematics, statistics, programming, data science, machine learning) to help identify optimal solutions to complex, multi-objective decision problems in linked social-ecological systems such as the Great Barrier Reef and Ningaloo.

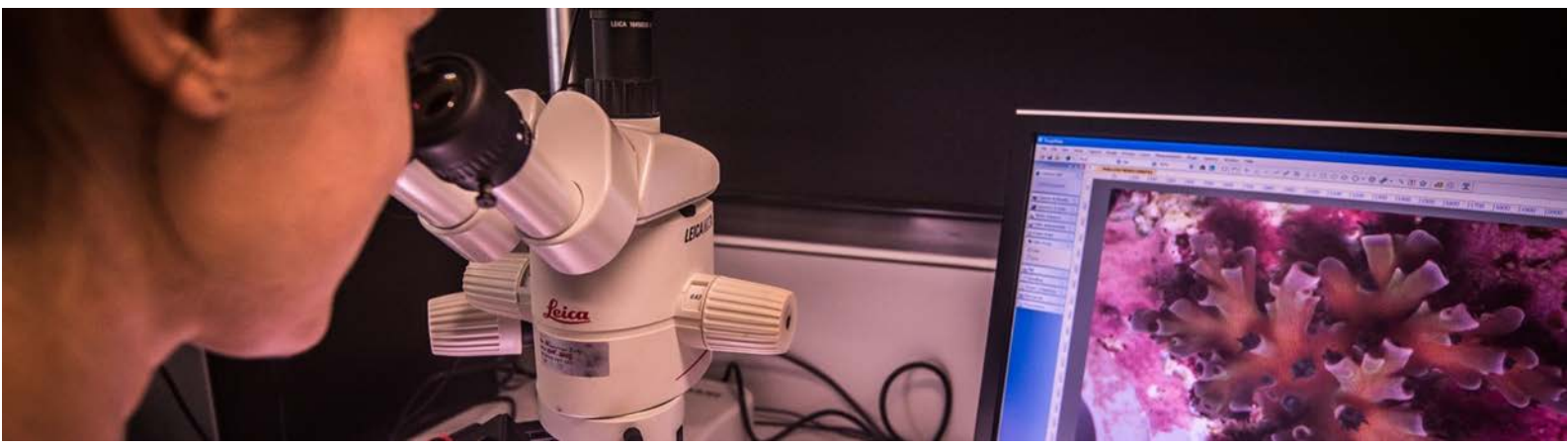
About you

You will have achieved your PhD in quantitative ecology, operations research, data science, applied mathematics, or another relevant discipline and possess strong programming skills in one or more major platforms (e.g. R, Matlab, C++, Python, Julia). You will have demonstrated application of these to problem-solving in complex systems, ideally in ecology. In addition to these qualities, your strong background in applied mathematics, statistics, complex-systems modelling and/or data science, and experience in leading or collaborating in solution-focused projects in the field of Operations Research or quantitative Decision Science, will enable to you to demonstrate your suitability for this opportunity..

If, after reviewing the position description (refer pages 8 - 11), you believe that your qualifications, experience and professional capabilities will enable you to successfully deliver the position responsibilities, we would be very interested in hearing from you.

The successful candidate will be rewarded with:

- AIMS AOF Level 4 Salary ($87,189 to $95,915 per annum))
- 15.4% superannuation
- Generous leave provisions
- Full-time, 4-year Fixed Term
- Located in Townsville, Queensland or Perth, Western Australia



How to Apply

Your application submission for our Postdoctoral Fellowship: Quantitative Decision Science / Operations Research opportunity should include the following documentation:

- Current Resume (including two current references);
- Document addressing the Key Selection Criteria (refer to page 7) within the scope of the position description (refer to page 8-11); and
- A short cover letter.

Shortlisted applicants may be asked to complete a Personal Outlook Analysis Questionnaire using the Birkman Method.

How to Apply:
Please submit your application via our website.

Closing Date:
Monday, 10-February-2021 (9am, Perth WA time)

Recruitment Contact:
Position enquiries can be directed to Ken Anthony at k.anthony@aims.gov.au or on 0455 055 392.

Further information on the application process and tips for addressing Selection Criteria are available via our Recruitment Application Guide.

Key Selection Criteria

Your responses to the following Key Selection Criteria must provide evidence of your suitability for this exciting opportunity within the scope of the position description (pages 8-11).

Essential

- PhD in quantitative ecology, operations research, data science, applied mathematics, or another relevant discipline
- Strong programming skills in major platform (e.g. R, Matlab, C++, Python, Julia) and demonstrated application to problem-solving in complex systems, ideally in ecology
- Demonstrated experience leading or collaborating with solution-focused projects in the field of Operations Research or quantitative Decision Science
- High level (relevant to opportunity and career stage) of academic achievement, quality and number of publications, and/or other forms of research output.
- Demonstrated record of successful multidisciplinary collaborations.

Desirable

- Experience solving problems in spatial modelling and statistics
- Demonstrated understanding of ecological economics
- Demonstrated interest in marine management and conservation
- Strong communication skills, especially engaging with stakeholders and government officials
- Experience working in interdisciplinary or multi-disciplinary teams
- Experience with modelling ecosystems (not necessarily marine)
- Demonstrated experience with good data-management practices and application of the principles of reproducible science.
- Demonstrated experience with using code repositories such a Git and GitHub.
- Willingness to learn new programming environments (languages and tools) to facilitate integrating your work with the team.

Position Description:
Postdoctoral Fellowship:
Quantitative Decision Science[1]/Operations Research[2].

Decision Science: quantitative approaches to inform decision-making, often in complex setting with multiple conflicting objectives. Cuts across business, risk, policy, design thinking and behavioural sciences **Operations Research:** applied mathematical branch of decision science, for example seeking optimal solutions to complex decision problems via analytical approaches, including artificial intelligence	
Team Membership:	AIMS Strategy Development, AIMS Modelling and Decision Support (M&DS) team
Primary Location:	Townsville, Queensland or Perth, Western Australia
Direct Supervisor:	Modelling and Decision Support Project Lead (Functional Supervisor) Team Leader – Spatial Ecology and Environmental Data Science (Administrative Supervisor)
Position Classification:	AIMS AOF Level 4
Functional Area:	Research Science
Position Summary:	• Decision Support is both a critical need and a critical gap at AIMS. Decision Support amounts to solution science, which is a strategic growth priority for AIMS. • This Postdoctoral Fellow will fill the most urgent and critical element of AIMS' capacity development in decision support: Operations Research. The Fellow will extend AIMS' modelling capability to help tackle complex decision problems for marine science, management and policy. The Fellow will do so by integrating advanced quantitative and analytical decision analyses (mathematics, statistics, programming, data science, machine learning) to help identify optimal solutions to complex, multi-objective decision problems in linked social-ecological systems such as the Great Barrier Reef and Ningaloo. • The Postdoctoral Fellowship is an essential step in AIMS' development plan for Decision Support to deliver evidence-based science and advice for AIMS and its customer base broadly. • The Fellow will join AIMS' multi-disciplinary team of oceanographic, biological and ecological modellers, and with national and international collaborators in the fields of engineering, economics. business strategy and social sciences.
Position Responsibilities:	• The Fellow will develop and use advanced analytical techniques to help the AIMS M&DS team develop effective environmental management and monitoring solutions for key clients and stakeholders. This includes quantitative decision analyses that can underpin the optimal R&D and deployment of new reef restoration and adaptation interventions on coral reefs. • The Fellow will work with the M&DS team to (1) demonstrate and build the profile of decision support at AIMS and (2) build the quantitative and programmatic capacity to develop quantitative, state-of the art decision-support systems, approaches and tools for AIMS and the people we help. • While the Fellow may not have economics or business strategy as their core field of expertise, they will apply an economic lens to their assessments of environmental, ecological, social, economic, and cultural benefits, costs and risks. This triple-bottom-line approach to problem solving will characterise the position and how it approaches solutions.

	• In collaboration with other team members, the Fellow will produce scientific papers, technical reports, and oral presentations in their area of expertise. Other areas of responsibility include: • Co-supervise research students, interns, and volunteers. • Comply with AIMS' workplace safety policies and procedures to ensure a safe workplace. • Comply with AIMS' Intellectual Property policies and procedures to ensure AIMS intellectual assets are captured, managed and protected. • Comply with AIMS' Code of Conduct ensuring the standards of conduct required of an AIMS staff member are upheld.
Key Responsibilities and Performance Standards	
Science Outputs:	*Milestones:* Ensure contracted or promised project deliverables are completed on time and of a high standard. *Publications:* Lead and contribute to papers published in peer-reviewed, high-quality scientific journals, to major reports, and to other key articles. *Presentations:* Present progress and results to AIMS, external stakeholders, funders, and collaborators as required, via meetings and other relevant events. *Reports:* Complete high-quality project reports for timely submission to funding bodies and clients as required. *Communications*: Collaborate with AIMS' communications team to produce webpage content and social-media outputs as requested.
Occupational Health & Safety:	Help to drive a safety culture at AIMS. In line with AIMS' Health and Safety Policy policies and procedures, participate in Manual Task (Functional) Assessments and Fit for Work medical assessments as required. Immediately report any work-related accident, injury or near accident to your direct supervisor. Identify workplace hazards and take corrective action with your supervisor's guidance. Ensure visitors, students, and staff for which you are responsible for have completed all OH&S inductions.
Intellectual Assets:	Comply with AIMS Intellectual Property policy, procedures and guidelines to ensure AIMS' intellectual assets are appropriately protected and managed.
Delegations:	Financial: as per delegations' manual. Financial: $1,000 limit on individual purchases. Performance Management: Ensure timely and accurate completion of required tasks. Actively participate in own personal performance planning and evaluation. Workforce Planning: Identify needs and recommend to supervisor.

Teamwork/supervisory:	Performance Management: Ensure timely and accurate completion of required tasks. Actively participate in own professional and personal development planning and performance evaluation in collaboration with functional and administrative supervisors. Recruitment to assist the team: Identify needs and recommend to supervisor. To work as a member of a multi-disciplinary team that values diversity while ensuring the achievement of AIMS' goals and objectives
External Customer, Partner, Collaborator and Stakeholder Requirements:	For any project, liaise and engage with collaborators, national and international project partners, and funders as appropriate.
Internal Organisational relationships:	Reports to: 1. Modelling and Decision Support Project Lead (Functional Supervisor) 2. Team Leader – Spatial Ecology and Environmental Data Science (Administrative Supervisor) Develop positive work relationships with other science and service staff and maintain regular communication with team, supervisor, and Program Leaders. Provide leadership, guidance and assistance on field trips to staff and visitors. Communicate on a regular basis with supervisors and provide information on progress and achievement of milestones.
Financial responsibilities and accountabilities:	Comply with AIMS' Fraud-Prevention Plan, ensuring the standards of conduct and ethical behaviour required of an AIMS staff member are upheld and that suspected fraudulent activity is prevented and/or reported. Manage AIMS' funds in a responsible manner and within delegation
Accountability:	If working on the projects of others, be accountable to the project leader. If leading a project, be committed to continuous organisational improvement by monitoring and challenging the performance of the project team and individuals.
Building Capability:	To act in accordance with AIMS Values, Policies and Procedures (How We Work culture).
Innovation, problem solving and continuous improvement responsibilities:	Assist in the improvement of daily operations, systems and processes associated with AIMS research. Apply an innovative mindset to problem-solving where possible and appropriate (thinking outside the box).

Planning responsibilities:	Performance Management: successfully participate in the AIMS annual Performance and Development program. Plan work activities to ensure milestones can be met to timelines. Have a plan B and think contingencies. Contribute positional requirements to operational planning.
Communication responsibilities:	Apply verbal communication skills to liaise, advise and report. Interact professionally with other team members and external collaborators to facilitate the achievement of projects. Maintain laboratory notebooks. Apply excellent verbal communication skills to influence, interpret, liaise, advise, report and counsel. Effectively communicate with team members, visitors and other staff to achieve project goals. Communicate scientific findings to a range of audiences, including scientists, managers, industry and the public. Compile reports of recorded data for supervisor and resulting publication plan.
Skills and Knowledge	
Essential Skills and Knowledge:	Strong background in applied mathematics, statistics, complex systems modelling and/or data science. Experience applying quantitative, structured decision-making approaches to complex decision problems, ideally in social-ecological systems Research background or training in spatial optimisation planning or spatial conservation prioritization Experience in Operations Research, specifically applying mathematics, statistics, and modelling to solving optimisation problems in environmental management or nature conservation A high level of proficiency in scientific computing and code development using one or more languages (Matlab, Python, R, Julia), and a willingness to learn others. High level of academic achievement, quality and number of publications, and/or other forms of research outputs relative to career stage and opportunity. Ability to work independently and complete tasks to tight deadlines Excellent oral and written communication skills and interpersonal skills. Ability and willingness to collaborate in interdisciplinary groups. Strong commitment to, and sound knowledge of, occupational health and safety issues and practices.

Desirable Skills and Knowledge:	In-depth understanding of marine conservation issues in tropical Australia, and an interest in undertaking targeted, multidisciplinary research to problem-solving Bayesian statistics and inference Spatial and temporal modelling and statistics Programming experience applying machine learning (e.g. reinforcement learning) to complex decision problems Expertise in managing large data sets and complex workflows Familiarity with information supply-chain management and optimisation for operations research Experience in, or willingness to learn, a low-level programming language (e.g. C++).
Qualifications and Experience	
Essential Qualifications and Experience:	Tertiary qualifications in science and laboratory techniques (i.e. Bachelor of Science) or equivalent experience. PhD in quantitative ecology, operations research, data science, applied mathematics, or another relevant discipline Strong programming skills in major platform (e.g. R, Matlab, C++, Python, Julia) and demonstrated application to problem-solving in complex systems, ideally in ecology Demonstrated experience leading or collaborating with solution-focused projects in the field of Operations Research or quantitative Decision Science High level (relevant to opportunity and career stage) of academic achievement, quality and number of publications, and/or other forms of research output. Demonstrated record of successful multidisciplinary collaborations
Desirable Qualifications and Experience:	Experience in ecological economics. High-performance computing
Technology and Equipment	
Technology & Equipment Used:	Microsoft Office Suite, networked personal computer and general office equipment.
Special Requirements	
Other Special Requirements	Current QLD C Class Open Drivers Licence or the willingness to obtain. Successfully participate in Manual Task (Functional) Assessments and Fit for Work medical assessments. Non-Australian Citizens must hold an appropriate Visa with working entitlements that allows paid employment with AIMS for the term of the appointment which is dependent on the current Department of Home Affairs policies.

About the Location

Townsville
Townsville is a vibrant and rapidly growing city in North Queensland. Surrounded by the Great Barrier Reef, numerous coastal islands, the Wet Tropics rainforest and the outback, and less than two hours by plane from Brisbane, the region experiences a warm tropical climate with more than 300 days of sunshine each year.

A diverse economic base with strengths in government administration, defence, education, marine science, natural resource management, manufacturing and mining, ports and shipping and agriculture supports a current population of over 190,000 people.

Boasting a relaxed lifestyle, residents of Townsville enjoy access to world-class educational, medical, sporting and recreational facilities. Townsville attracts high-quality national and international festivals, cultural and sporting events.

For further information visit www.townsville.qld.gov.au

Perth
Perth is a vibrant city and an exciting hub located on the west coast of Australia. Perth sits along the Swan River and is surrounded by unique landscapes, from Australian bushland in the west to rolling coastline 12 km east of the city.

Perth is a fast-developing region, with a population of over 2 million people. Perth's diverse economic base is supported by key industries including professional, scientific and technical services (the largest industry employer), government and administration, resources, and health.

Perth offers an array of opportunities for residents including exploration of diverse outdoor spaces, world-class national and international cultural and sporting events, architectural and historical attractions, and access to high-quality health, entertainment, medical, educational and sporting facilities. Perth is also recognised as the sunniest capital city in Australia.

More information: www.perth.wa.gov.au