

Impactful research for the Tropics and beyond

JAMES COOK UNIVERSITY



Research with purpose

Across the Tropics, the challenges we face are immediate, complex and increasingly consequential at both regional and global scales for the health of our communities, the resilience of our environments, and the future of our region. They demand research that is not only based on excellence but is purposeful, responsive to context and capable of delivering meaningful and sustained impact.

James Cook University's (JCU) research is grounded in the unique environments and communities of the Tropics. Strengthened through sustained partnerships, JCU's research is shaped by place and driven by a challenge-led approach to generate solutions that improve lives, strengthen resilience, and support sustainable development, both locally and globally.

From improving access to healthcare in regional, rural and remote communities, to protecting ecosystems under increasing pressure, and working alongside industry and communities to respond to economic, societal and environmental change, our research is defined by its purpose, rigour and impact.

"The most meaningful research is grounded in the places and communities it serves. Together with our partners, we are shaping solutions that improve lives, strengthen resilience and create lasting impact across the Tropics and beyond."



Professor Jenny Seddon
Deputy Vice Chancellor, Research

We are proud of what our research represents, not only for the depth and breadth of expertise across the University, but the way that expertise is mobilised to bring together disciplines, sectors and regions to address complex challenges with a focus on outcomes. Our research is undertaken in partnership with Traditional Owners, industry, government, and communities across Northern Australia and Southeast Asia. These partnerships are central to ensuring our research is grounded in local knowledge, responsive to real world needs and positioned to deliver impact at scale.

As global attention increasingly turns to the Tropics, the opportunity to shape solutions with international relevance has never been greater. We are committed to working with partners who share our ambition and commitment to delivering tangible benefits for the Tropical regions and the communities who call them home.

Contents

Research with purpose.....	2	INDIGENOUS FUTURES	
Research at a glance	4	Elevating and supporting Indigenous futures	16
Why the Tropics?	6	DELIVERING RESEARCH IN THE TROPICS	
HEALTH AND WELLBEING		Built for research in the Tropics.....	18
Advancing health and wellbeing in the Tropics	8	RESEARCH IN PRACTICE	
SUSTAINABLE ENVIRONMENTS AND FOOD SYSTEMS		The next generation of research	20
Thriving tropical ecosystems and environments	10	CONNECTED RESEARCH	
RESILIENT REGIONS		JCU's research ecosystem	21
Sustainable and resilient regional and tropical economies	12	WORKING IN PARTNERSHIP	
EQUITABLE SOCIETIES		Partner with JCU.....	22
Enriching people, communities and societies of the Tropics	14		

RESPECT. NOW. ALWAYS

James Cook University values and celebrates the diversity of our community, and is committed to ensuring our learning and working environment is safe and welcoming.

JCU is proud to be part of the Respect. Now. Always. campaign – a national initiative led by Universities Australia to highlight our determination to ensure our students and staff are safe from discrimination and sexual harassment. Further information about the campaign and free services available for students can be found at jcu.edu.au/safety-and-wellbeing

OUR COMMITMENT TO AUSTRALIAN ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES

James Cook University is committed to building strong and mutually beneficial partnerships that work towards closing the employment, health and education gap for Australian Aboriginal and Torres Strait Islander peoples.

Our students come from many backgrounds, promoting a rich cultural and experiential diversity on campus.

We acknowledge the Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the Australian lands and waters where our staff and students live, learn and work. We honour the unique cultural and spiritual relationship to the land, waters and seas of First Australian peoples and their continuing and rich contribution to James Cook University (JCU) and Australian society. We also pay respect to ancestors and Elders past, present and future. Aboriginal and Torres Strait Islander peoples are advised that this publication may contain names or images of people who have passed away.



Information is correct at the time of printing. This document has been printed on ecoStar+ 100% Recycled Uncoated paper.
CRICOS Provider code 00117J. TEQSA Provider ID: PRV12077.

Research at a glance

JCU research is defined by its scale, quality and impact – grounded in the Tropics and connected to global challenges.

ANNUAL RESEARCH INCOME

\$60M+

Sustained investment in research addressing challenges across the Tropics

PARTNERSHIPS ACROSS SECTORS

98

Corporate

43

Non-profit

56

Medical

41

Government

Active collaborations with industry, health, community and government partners

RESEARCH QUALITY – GLOBAL BENCHMARK

2.33

More than twice the world average citation rate across research disciplines, reflecting high-quality and widely cited research

RESEARCH INFORMING POLICY

12%

Research publications cited in policy documents contributing to decision-making beyond academia

Research Income is HERDC reported income for 2025. Partnerships reflect current projects where a partner is a member of the project team, a collaborator or providing in-kind support for the project.
Citation and policy impact sourced from SciVal for years 2022-2025. Field-weighted citation index compares citation performance to global averages.

Why the Tropics?

The Tropics are at the forefront of some of the world’s most pressing challenges. Home to approximately 40 per cent of the world’s population, including many of its fastest growing and youngest populations, and to two-thirds of global plant and animal species, the Tropics are increasingly central to global challenges such as climate change, biodiversity loss, health inequities and rapid population growth.

JCU sits at the centre of this region. Its proximity to Southeast Asia and the broader Indo-Pacific, its diverse environments and communities, and its exposure to environmental and social change make it a critical setting for research that is both locally grounded and globally relevant.

With main campuses in Townsville, Cairns and Singapore, JCU works across reef, rainforest, rangelands and the region’s industries and communities. Our approach is shaped by place and strengthened through long-term partnerships with industry, government and communities.

By addressing challenges where they are most visible and immediate, JCU’s research generates insights and solutions that extend beyond the region, informing policy, improving practice and building more resilient systems in comparable environments and economies around the world.





Advancing health and wellbeing in the Tropics

Healthy lives for people in Northern Australia and the Tropics through health and health-care research.

For communities in regional, rural and remote areas, better health outcomes depend on stronger, more accessible health systems. JCU's work across Northern Australia and the Asia-Pacific combines place-based research and partnerships to address major health challenges including infectious diseases, mental health and chronic conditions and reducing health inequalities.

KEY RESEARCH AREAS

These research directions represent our flagship work supported by JCU's broader research expertise.

- Advancing tropical health and medicine through improved understanding, diagnostics and prevention of infectious and vector-borne diseases and toxinology, with regionally adapted capability to address emerging health challenges.
- Strengthening health systems and healthcare delivery in regional and remote communities through workforce development, harnessing digital technologies to improve access and developing sustainable models of care.
- Addressing diseases of high impact in our populations including cardio-metabolic conditions and mental health by improving prevention, diagnosis, treatment and health outcomes for tropical communities.

IMPACT IN ACTION

Stopping outbreaks before they spread

PacMOSSI, a regional program led by JCU, is strengthening mosquito surveillance across Pacific Island nations. Beyond surveillance, the program trains Pacific vector control and health professionals in mosquito control and insecticide resistance monitoring, using a train-the-trainer model so skills can be shared across countries. By combining research, training and digital systems, teams can detect outbreaks earlier and respond to the spread of vector-borne diseases across the tropics.

Diagnosing stroke faster in critical moments

A pattern of 11 genes found in the blood of stroke patients could soon replace the need for specialist imaging to diagnose ischaemic stroke. Research at JCU is advancing this approach, with the potential to improve access and reduce delays in treatment, particularly for patients in regional and remote areas without access to specialist imaging in the optimal treatment time window.

Preventing perinatal distress before it begins

Developed in partnership with local health services, Beyond the Bump is a North Queensland program designed to prevent perinatal depression and anxiety. Co-designed with women and clinicians, it uses social media to deliver evidence-based support and strengthen early access to care.

Co-designing healthier ageing in remote communities

Higher rates of dementia and chronic disease in remote communities are driving the need for new approaches to care. Working closely with Aboriginal and Torres Strait Islander communities in the Torres Strait, JCU research is co-designing and implementing culturally appropriate models of healthy ageing. This work is strengthening prevention, improving service delivery and supporting better long-term health outcomes.



Thriving tropical ecosystems and environments

Managing, conserving and protecting our land, coast and sea environments for resilience and adaptation to climate change.

Sustaining ecosystems and ensuring food security in the Tropics is critical to economic, environmental and community resilience. JCU works with partners to support more sustainable management of marine and land environments while addressing climate impacts, resource pressures and food production.

KEY RESEARCH AREAS

These research directions represent our flagship work supported by JCU's broader research expertise.

- Supporting a nature-positive future for tropical marine and land environments through biodiversity conservation, restoration and adaptation.
- Safeguarding our environments, populations and primary industries through strengthened biosecurity with a One Health approach, including improved detection, eradication and containment of invasive species and disease, and training the future workforce.
- Building food security in adaptive tropical food systems by supporting sustainable and efficient aquaculture and agricultural production.
- Enhancing water security and equitable water resource management across marine, freshwater and groundwater ecosystems.

IMPACT IN ACTION

Protecting reef ecosystems at scale

Improving how pressures on coral reefs are detected and managed enables faster and more targeted responses to threats such as Crown-of-Thorns Starfish outbreaks. This, in turn, supports large-scale reef monitoring and management, helping protect ecosystem health across the Great Barrier Reef.

Detecting crop disease before yields are lost

AI and satellite data are supporting earlier detection of diseased sugarcane. Developed with growers in the Herbert River region, this approach is applied in real-world farm conditions to identify disease before symptoms appear. This enables earlier intervention, helping growers protect yield and reduce costs.

Finding invisible threats to ecosystems

Environmental DNA is transforming biosecurity by improving how invasive species are detected. By analysing water, air and soil samples, emerging threats can be identified earlier, improving response times and protecting ecosystems and industries.

Advancing aquaculture for food security

Improving the performance and resilience of key aquaculture species can help strengthen food security in tropical regions. Working with industry and partners in Australia and Singapore, JCU research applies advanced genetics to support more sustainable and productive aquaculture systems, from barramundi breeding to disease resilience and newly farmed species such as red snapper.





Sustainable and resilient regional and tropical economies

Supporting industries to deliver regional economies that benefit our communities.

Regional communities need thriving and diversified economies. Through long-standing partnerships with industry and government, JCU is helping established industries innovate and enabling emerging industries to develop. This work is advancing disaster-ready infrastructure and strengthening preparedness, response and recovery across Northern Australia and Southeast Asia.

KEY RESEARCH AREAS

These research directions represent our flagship work supported by JCU's broader research expertise.

- Strengthening resilience and adaptation, including in response to climate change, by developing disaster-ready infrastructure as well as improved models of preparedness, response and recovery.
- Supporting the transition to sustainable, low-carbon economies, including decarbonisation and the circular economy, by developing both technological advances and the business model adaptations required to deliver this transition.
- Enhancing regionally important industries including the prospecting and processing of critical minerals and the development of advanced materials.

IMPACT IN ACTION

Improving reef monitoring and management

Long-standing collaboration between industry and JCU is improving how reef environments are monitored and managed. By combining science with operational practice, this work is strengthening the resilience of coastal systems and supporting more effective long-term decision-making.

Helping communities withstand extreme weather

Decades of research at JCU's Cyclone Testing Station are helping homes and infrastructure withstand extreme weather. Practical tools and refined building standards now inform better building design, maintenance and risk reduction across cyclone-prone regions.

Advancing critical minerals development in Northern Australia

Understanding complex mineral systems is critical to developing the resources needed for the global energy transition. Drawing on four decades of research and deep industry relationships, JCU's research improves how mineral systems are interpreted and how projects progress in practice, supporting more informed decision making in challenging environments.

Turning agricultural waste into materials for energy transition

Agricultural waste such as sugarcane fibre can be transformed into graphene used in batteries, electronics and emerging technologies. Research at JCU is developing a low-impact production process that avoids harsh chemicals, reducing reliance on scarce resources and creating new uses for agricultural byproducts.



Enriching people, communities and societies of the Tropics

Building meaningful, inclusive and safe societies in support of our communities in a changing world.

Fairer outcomes depend on improving access, opportunity and participation across systems where barriers to service delivery exist. JCU works with communities and providers to generate evidence and translate it into approaches that improve services, strengthen wellbeing and address systemic barriers, supporting greater equity and social justice.

KEY RESEARCH AREAS

These research directions represent our flagship work supported by JCU's broader research expertise.

- Creating fairer opportunities for people and communities across regional, rural and remote Australia by identifying systemic barriers and designing locally relevant solutions.
- Improving social wellbeing, participation and resilience through evidence-based policy and practice, working with local service providers to ensure services are accessible, effective and responsive to local needs.
- Addressing the underlying drivers of disadvantage to achieve more equitable outcomes, while supporting communities to lead and participate in societal change.

IMPACT IN ACTION

Improving access to disability and rehabilitation services in regional communities

People across Far North Queensland face significant barriers to accessing disability and rehabilitation services. FNQ Connect, a region-wide collective impact initiative, brings together people with lived experience of disability and rehabilitation, community members, and service providers from government, the non-government sector, Aboriginal and Torres Strait Islander community-controlled organisations, and local councils across Far North Queensland. Together, they are working to connect care, strengthen local workforces and build more inclusive communities so people can access the right support closer to home.

Giving frontline professionals practical tools to respond to domestic violence

A new guide informed by JCU research is helping dental professionals recognise and respond to domestic violence. It translates evidence into practical guidance for frontline care, improving how services identify and support people experiencing complex social issues.

Supporting communities to shape their own futures

In the Solomon Islands, JCU is working with communities to identify priorities and plan for sustainable livelihoods. This work supports locally led decision-making and helps communities respond to social and environmental change with greater confidence and control.

Strengthening care through integrated social services

Embedding social workers in general practice is improving how patients with complex social and health needs are supported. Working with practices across North Queensland, this approach is improving early identification and management of psychosocial issues, reducing pressure on GPs and enabling more integrated, preventative models of care.





Elevating and supporting Indigenous futures

Embracing Indigenous knowledge as a catalyst for realising Indigenous futures and self-determination.

Stronger outcomes for Indigenous communities are built on self-determination, cultural knowledge and Indigenous-led decision-making. JCU's Indigenous Futures research agenda is focused on supporting Aboriginal and Torres Strait Islander peoples to determine their own futures through research shaped by local priorities and aspirations. Through partnerships with Aboriginal and Torres Strait Islander peoples, the University supports Indigenous-led research while building the capability of researchers across JCU to work respectfully with Indigenous communities and knowledge systems. By aligning education and research with community priorities, JCU contributes to pathways for education, employment and economic development, helping to strengthen community capability and support sustainable futures.

KEY RESEARCH AREAS

These research directions represent our flagship work supported by JCU's broader research expertise.

- Building Indigenous educational, professional and research capacity through student success, academic capability, leadership development and pathways across disciplines and careers.
- Advancing Indigenous-led research that strengthens governance, decision-making and community authority across policy, institutional and research systems.
- Creating pathways for Indigenous-led community and economic development through applied research, including ranger programs, land and sea management, and climate futures.

IMPACT IN ACTION

Turning on-Country expertise into recognised qualifications

Indigenous rangers are gaining new pathways to university qualifications through a JCU model that uses AI to recognise existing skills, Indigenous knowledge and on-Country experience. The approach enables rangers to study while continuing to work in their communities, strengthening education and employment pathways across Northern Australia.

Restoring seagrass with Traditional Owners

Seagrass meadows play a critical role in supporting marine life, fisheries and carbon storage. Partnerships with Traditional Owner groups are helping restore these ecosystems through locally tailored approaches that rebuild resilience after cyclones and other disturbances.

Strengthening Indigenous learner and graduate capacity

Research at JCU has informed new approaches to Indigenous education that build learner identity, self-efficacy and academic capacity. Since 2016, this work has contributed to 750 Aboriginal and Torres Strait Islander graduates earning 1,171 degrees, with average subject pass rates increasing from 64.2% to 82.4%.

Guiding Indigenous-led research in practice

Resources co-developed with Indigenous partners are guiding research from co-design through to implementation. Grounded in data sovereignty, ethics, Indigenous protocols and community control, these tools provide step-by-step guidance for delivering research on Country. Already being adapted by researchers and organisations nationally, this approach is strengthening community-led research practice.

Jayden Crump from Mandubarra Land & Sea Aboriginal Corporation planting seagrass for restoration activities supporting coastal ecosystem recovery. Photo: TropWATER.



Built for research in the Tropics

JCU's research capability is shaped by where and how we work – integrating field environments, advanced facilities, data systems and partnerships to deliver research in real-world settings.

FIELD STATIONS IN GLOBALLY SIGNIFICANT ENVIRONMENTS

JCU gives researchers direct access to some of the world's most important tropical environments.

- Orpheus Island Research Station – reef-based research and monitoring on the Great Barrier Reef, supporting long-term marine and climate research
- Daintree Rainforest Observatory – rainforest research supported by laboratories and a 47-m canopy crane providing access to the upper forest
- Fletcherview Research Station – applied research in agriculture, land management and tropical production systems

SPECIALIST FACILITIES FOR TROPICAL RESEARCH

JCU's specialist research facilities support work in the environments and conditions where tropical challenges are most visible. From secure laboratories and advanced analytical instrumentation to field-based infrastructure and controlled testing facilities, they enable applied research across health, environmental, industrial and resilience challenges.

- PC3 laboratory supporting research into high-risk infectious diseases
- Mosquito Research Facility enabling research into mosquito behaviour, disease transmission and vector control
- Advanced microscopy and analytical instrumentation for geological, environmental and biological analysis
- Cyclone Testing Station facilities, including wind tunnel infrastructure, supporting resilient building design
- Marine and aquaculture research facilities in Australia and Singapore, supporting large-scale, applied research in conservation and sustainable food production
- Environmental Research Complex supporting research into environmental change across plants, pollinators and ecosystems



Daintree Rainforest Observatory.



Orpheus Island Research Station.



Cyclone resilience research and testing infrastructure.

GENOMICS AND MOLECULAR INSIGHTS

JCU uses molecular and genomic tools to understand complex biological and environmental systems in the Tropics.

- Tracking disease and pathogen behaviour
- Understanding biodiversity and ecosystem change
- Supporting advances in diagnosis, surveillance and environmental monitoring

DATA AND AI IN REAL-WORLD SETTINGS

JCU applies AI and data science in real-world contexts to improve how complex problems are understood and managed across the Tropics.

- AI and data tools supporting diagnosis, environmental monitoring and decision-making in complex systems
- Field-based data collection using remote sensing, drones, acoustic technologies and sensors to monitor environments at scale, with applications spanning conservation, coral reef assessment and marine wildlife management
- Integration of field, laboratory and data systems to connect analysis with practical application

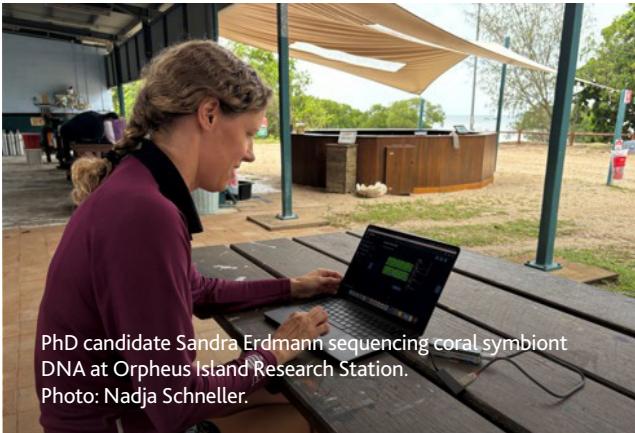
RESEARCH GROUNDED IN PARTNERSHIP

JCU's capability is not just infrastructure – it is the ability to work with the people and organisations closest to the problem.

- Partnerships spanning government, industry, communities and Traditional Owners
- Indigenous partnership and co-design embedded across research approaches
- Engagement across Northern Australia and Southeast Asia



Researchers at the Australian Institute of Tropical Health and Medicine.



PhD candidate Sandra Erdmann sequencing coral symbiont DNA at Orpheus Island Research Station. Photo: Nadja Schneller.



Marine and aquaculture research facilities in Singapore.

The next generation of research

JCU's higher degree research (HDR) candidates are central to delivering research in practice – contributing to applied research across the Tropics while building the next generation of researchers, professionals and leaders.

HDR CANDIDATES

917
A substantial research cohort aligned to tropical research priorities

RESEARCH GRADUATES

154
New research capability across academia, industry and government

GLOBAL COHORT

439
International HDR candidates contributing to a globally connected research community, representing almost half of JCU's 2025 HDR cohort

INDUSTRY-INTEGRATED RESEARCH

13 PhD@Work candidates
Integrating research and professional practice to deliver real-world outcomes

NEAR-TERM PIPELINE

51 under examination
A strong pipeline of future research graduates

HDR enrolment and graduation statistics are based on 2025 data. Candidates under examination are reported as at 2026.



JCU's research ecosystem

JCU's research ecosystem brings together colleges, institutes and centres across the University. Each plays a distinct role – from foundational research and training to large-scale programs and partnerships – working together to deliver research that is collaborative, place-based and focused on real-world outcomes.

COLLEGES

- College of Arts, Society and Education
- College of Business, Law and Governance
- College of Healthcare Sciences
- College of Medicine and Dentistry
- College of Science and Engineering

RESEARCH INSTITUTES AND CENTRES

- Australian Institute of Tropical Health and Medicine (AITHM)
- The Cairns Institute
- Tropical Futures Institute
- Tropical Marine and Coastal Institute
- Agricultural Technology and Adoption Centre (AgTAC)
- Centre for AI and Data Science Innovation (CADSI)
- Centre for Climate Adaptation and Disaster Resilience (Launching 2026)
- Centre for International Trade and Business in Asia (CITBA)
- Centre for Rural, Remote and Tropical Health Systems
- Centre for Sustainable Tropical Fisheries and Aquaculture (CSTFA)
- Centre for Tropical Bioinformatics and Molecular Biology (CTBMB)
- Centre for Tropical Biosecurity (CTB)
- Centre for Tropical Environmental and Sustainability Science (TESS)
- Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER)
- Economic Geology Research Centre (EGRU)
- Indigenous Education and Research Centre (IERC)
- Margaret Roderick Centre for Mental Health Research
- Australian Tropical Herbarium (ATH)
- ARC Centre of Excellence for Indigenous and Environmental Histories and Futures (CIEHF)



Partner with JCU

JCU works with government, industry and community partners to address complex challenges across the Tropics. Our approach is collaborative and practical – bringing together research expertise, local knowledge and real-world application across Northern Australia and Southeast Asia.

WAYS TO ENGAGE

Collaborate on research projects

Work with JCU researchers on projects aligned to your priorities, from early-stage problem definition through to implementation and evaluation.

Access expertise and research infrastructure

Draw on specialist expertise, field sites, data capabilities and infrastructure that support research in real-world conditions.

Commission research and analysis

Partner with JCU to undertake targeted research, evaluation or advisory work that informs policy, investment and decision-making.

Develop workforce capability

Support training, higher degree research and workforce development aligned to your organisation's future needs.

Co-invest in strategic programs

Collaborate on large-scale initiatives that address shared challenges at regional, national or international scale.

To explore partnership opportunities, contact: researchpartnerships@jcu.edu.au or visit jcu.edu.au/research

Support research through philanthropy

Help address complex challenges across the Tropics through philanthropic giving that enables research with lasting impact for communities, environments and industries.

To explore philanthropic opportunities, contact: toni.lawrence@jcu.edu.au



Advanced Analytical Centre

World-class research
inspired by place, focused
on sustainability, and driven
by real-world impact.



jcu.edu.au/research



JAMES COOK
UNIVERSITY
AUSTRALIA