

2023 Sustainability Report



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JCU Indigenous Education and Research Centre student graduations 2023

Acknowledgement of Country

JCU acknowledges, honours and respects the Elders, Traditional Owners and Historical People¹ in the communities where our campuses and study centres are located, who share their cultural insights, wisdom and knowledge with the University on a daily basis.

We pay our respect to the Elders, past, present and emerging of the Bindal People on whose lands our Bebegu Yumba campus lies, and the Wulgurukaba Peoples of the Townsville region. We also acknowledge the Yirrganydji Peoples where our Nguma-bada campus in Cairns is based and the other First Peoples of the region the Djabugay, Gunggandji and Yidinji Peoples. We also respectfully acknowledge the Yuibera Peoples of the Mackay region, the Muralag, Kala Lagaw Ya, Kalaw Kawaw Ya and Meriam Mir Peoples of the Torres Strait and the Kalkadoon Peoples of the lands around Mount Isa. The University acknowledges the Indigenous Peoples of Australia as the longest continuous surviving cultures on the planet and is grateful for the contributions that Indigenous staff and communities have made to the diverse and inclusive environment of the University.



¹ Historical people is a term used by Australian Aboriginal and Torres Strait Islander peoples who live on land where they are not Traditional Owners. Through no fault of their own under Government legislation, Historical People were sent away from their communities. Some Historical People have played a major role in the areas where they live. It is important that these people who have contributed to self-determination also be given the courtesy and respect they deserve. It is usually the Traditional Owners who have been involved in their communities at the grass roots level, who would know which Historical People should be engaged.

A Message from the Vice Chancellor and President

It gives me great pleasure to present James Cook University's (JCU) 2023 Sustainability Report.

As we reach the halfway point in the United Nations' 2030 Agenda for Sustainable Development, JCU remains deeply committed to advancing the global Sustainable Development Goals (SDGs). This report not only highlights our successes in 2023 but also reinforces our ongoing leadership in sustainability, both locally and internationally.

This year has been a pivotal one for JCU, with remarkable improvements in our global rankings. We are especially proud to have been ranked #2 in the world for SDG 17 (Partnerships for the Goals), demonstrating our strengthened collaborations that drive meaningful change. Our focus on health, biodiversity, and partnerships further showcases the significant contributions of JCU's research, education, and community outreach to strengthen our contributions to both local and international communities.

In 2023, JCU made strides in social sustainability by expanding financial aid for students facing cost-of-living challenges and enhancing diversity, equity, and inclusion initiatives. Additionally, our researchers continued to provide innovative solutions in areas such as climate action, sustainable agriculture, and marine conservation, reinforcing JCU's leadership in tackling the most pressing environmental and societal challenges of our time.

Looking forward, our commitment to achieving a carbon-neutral future remains at the forefront of our strategy. In 2024, we will intensify our focus on carbon management, energy efficiency, and sustainable transport across all campuses, while continuing to engage our students, staff, and wider community in this transformative journey.

As we reflect on the successes of the past year, our future looks bright as JCU will continue to impact the creation of a sustainable future for life in the Tropics and beyond.

Together, we can build a better world for current and future generations.



Professor Simon Biggs

**VICE CHANCELLOR AND PRESIDENT
JAMES COOK UNIVERSITY**



Figure 1.1: Global progress towards the United Nations Sustainable Development Goals at the halfway point in the goals from 2015 to 2030

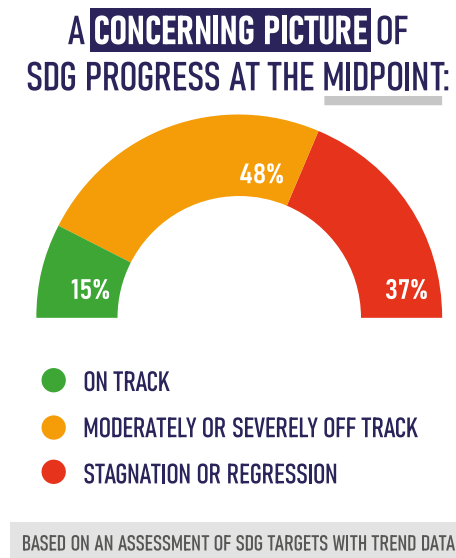


Figure 1.2: Australian progress towards UN SDGs, 2015 to 2023

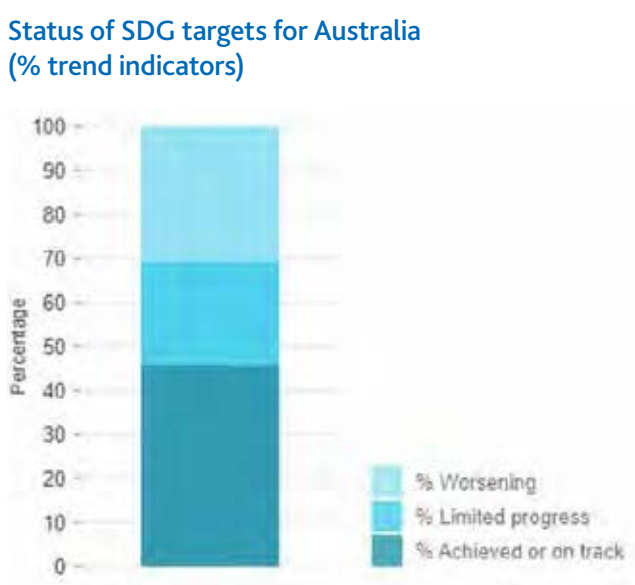
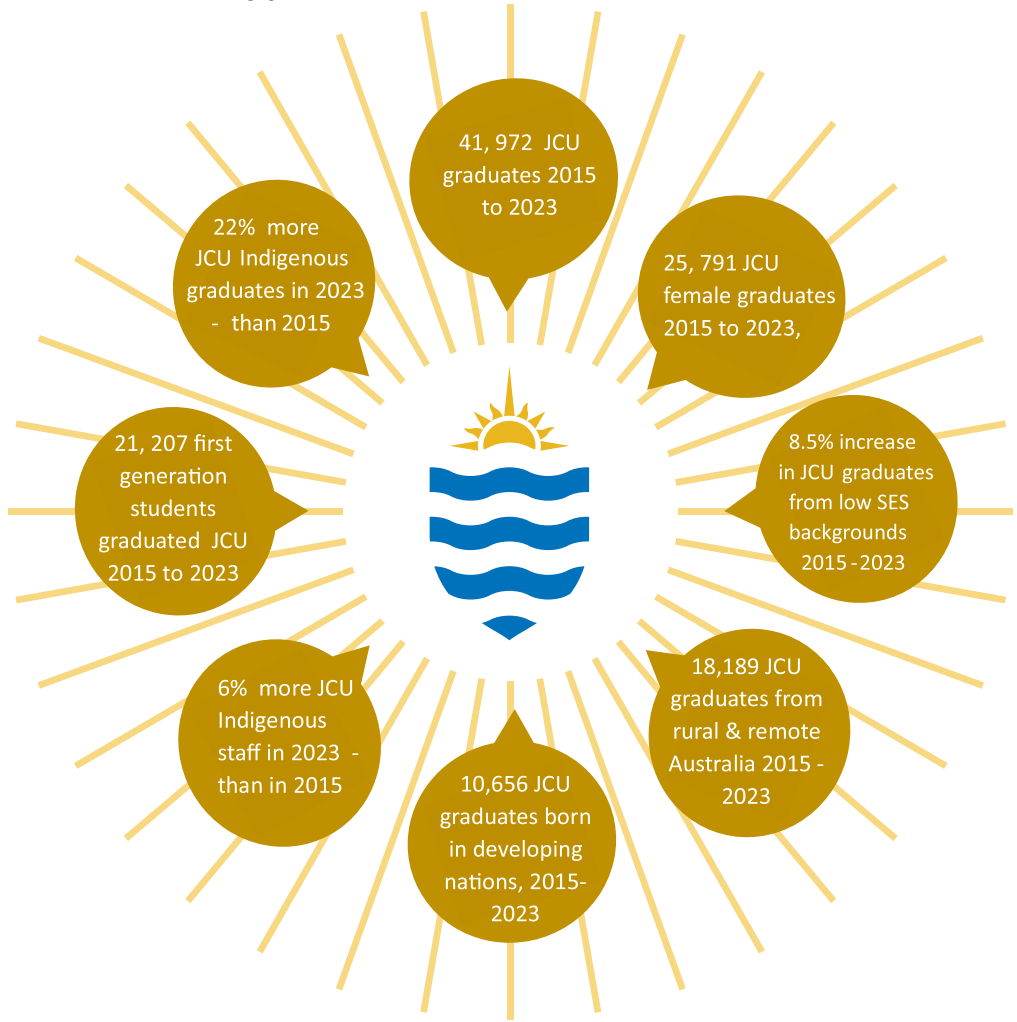


Figure 1.3 JCU progress towards education, diversity, inclusion and equity goals, at the halfway point for the UN SDGs, 2023.



1.0 Introduction

The United Nations has released a special edition of their annual Sustainable Development Goals Report for 2023, showcasing significant progress. Notably, 15% of the Goals are on track to be achieved by 2030, reflecting the global commitment to sustainable development. In Australia, the Sustainable Development Solutions Network reports that over 45.8% of the UN SDG targets are achieved or on track, demonstrating substantial national efforts towards sustainability.

The UN Annual Sustainable Development Goals Report 2023 also identifies five key areas for urgent action, providing a clear roadmap for accelerating progress and reversing any setbacks. This proactive approach underscores the global dedication to achieving the SDGs and ensuring a sustainable future for all.

Since becoming the first Australian university signatory to the University Commitment to the Sustainable Development Goals in 2016, James Cook University (JCU) has made significant strides in North Queensland, rural and remote Australia, and the tropics worldwide. Our efforts have been particularly impactful in SDG 3

(Good Health and Well-being), SDG 10 (Reduced Inequalities), SDG 14 (Life Below Water), and SDG 15 (Life on Land). JCU's research achievements, education programs, community outreach, and influence over national policy have been highly significant over the past eight years.

In this report, we highlight James Cook University's remarkable achievements in 2023 towards the UN SDGs. The Report is organised into key pillars of sustainability action: research, education, environmental, social, and economic sustainability, and governance. This structure allows us to effectively report on our efforts to meet the UN SDGs in these areas.

Additionally, the release of the Australian University Accord Final Report will shape the future of tertiary education in Australia and positively impact future sustainability plans for JCU. Our actions towards the key topics in the Accord aim to make JCU a thriving institution, serving the tropics of Australia, and setting a leading example of sustainable development for our community.

Table 1.1: Five Key Areas for Urgent Action for the UN Sustainable Development Goals

1	Heads of State and Government should recommit to seven years of accelerated, sustained and transformative action, both nationally and internationally, to deliver on the promise of the Sustainable Development Goals.
2	Governments should advance concrete, integrated and targeted policies and actions to eradicate poverty, reduce inequality and end the war on nature, with a focus on advancing the rights of women and girls and empowering the most vulnerable.
3	Governments should strengthen national and subnational capacity, accountability and public institutions to deliver accelerated progress towards achieving the Sustainable Development Goals.
4	The international community should recommit at the SDG Summit to deliver on the Addis Ababa Action Agenda and to mobilize the resources and investment needed for developing countries to achieve the Sustainable Development Goals, particularly those in special situations and experiencing acute vulnerability.
5	Member States should facilitate the continued strengthening of the United Nations development system and boost the capacity of the multilateral system to tackle emerging challenges and address Sustainable Development Goals-related gaps and weaknesses in the international architecture that have emerged since 2015.

1.1 James Cook University’s Sustainable Development Goals Journey: 2015 to 2023, at the midpoint of the 2030 Agenda for Sustainable Development

JCU made significant improvement in global ranking for progress towards most UN SDGs in the Times Higher Education (THE) Impact Ranking results between 2023 and the 2024 ranking. Although JCU’s overall position remains in the 101 to 200 bracket, the overall score improved from 83.8/100 in 2023 to 87.5/100 in 2024. The greatest improvement was in SDG 17, Partnerships for the Goals, from ranking 401-600 in the world in 2023 with a score of 65.9/100, to #2 in the world in 2024 with a score of 99.3/100, out of 2031 institutions. This huge improvement of 33.4% is largely accredited to our improved

reporting on progress towards the goals in the first JCU Interim Sustainability Report published in 2023. Previously it was challenging for the public and the global ranking assessors to find all of JCU’s diverse achievements, and by reporting them in one comprehensive report, these achievements can really be seen to be remarkable. JCU continues to improve on its communication of its achievements to the public through this second sustainability report, and through the launching of a new Sustainability Hub webpage which will be a portal to all JCU’s sustainability actions and news.

Figure 1.4 JCU results for the Times Higher Education Impact Ranking 2024 (shown as dots on the error bars).



Figure 1.5: Improvement in JCU’s rank in the Times Higher Education Impact ranking compared with increase in number of participating institutions over time.

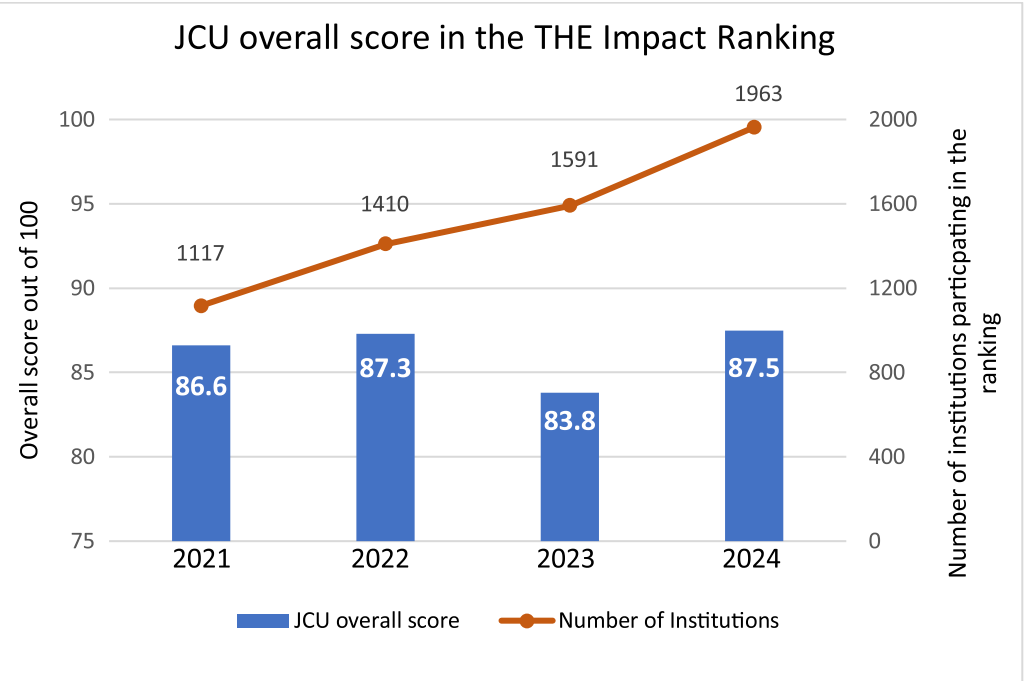
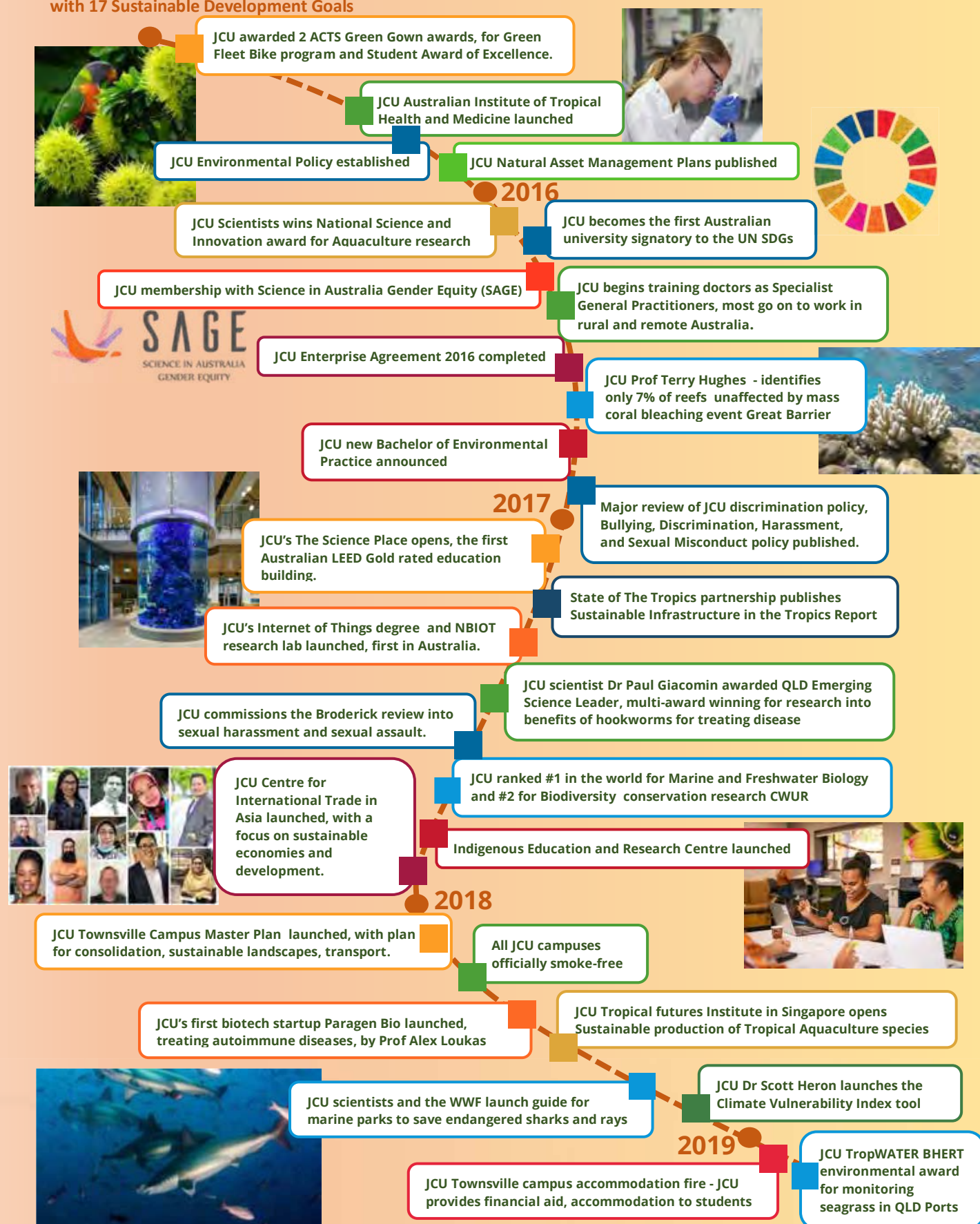


Figure 1.6 2015 -2023 – JCU's journey towards the UN Sustainable Development Goals

2015 United Nations Agenda for 2030 released with 17 Sustainable Development Goals



Journey on to 2030 to reach the Goals



1.2 2023 JCU Sustainability Success Highlights

1.2.1 2023 JCU National and International Sustainability Awards

2 ZERO HUNGER

- Southern African Society of Veterinary Epidemiology and Preventative Medicine (SASVEPM) Lifetime Achievement Award to Professor Bruce Gummow, in the field of veterinary epidemiology and preventative medicine.
- North Australia Beef Research Council Scientist/Researcher Medal - Chris Gardiner College of Public Health, Medical & Veterinary Sciences, Agronomy Lecturer.

3 GOOD HEALTH AND WELL-BEING

- 2023 Australia Day Ambassador for Queensland, the late Professor Peter Leggat AM, ADC, previously Professor in Public Health and Tropical Medicine.
- 2023 Australia Day Honours Member of the Order of Australia Professor Edward Strivens, for significant service to geriatric medicine, and to professional organisations.
- Life Science Queensland (LSQ) - Globally Engaging Networking Event (GENE) Awards:
 - Queensland Institute of Medical Research (QIMR) Berghofer Woman of Influence Award in the Life Sciences Queensland – awarded to Professor Sabina Knight, Director of the JCU Central Queensland Centre for Rural and Remote Health.
 - LSQ Merck Life Science Rural and Regional Service Award Finalist, Professor Andrew Krockenberger, Dean of Research.
 - LSQ McCullough Robertson Industry Excellence Award Finalist - Associate Professor Andreas Kupz, Principal Research Fellow in the Australian Institute of Tropical Health and Medicine.

4 QUALITY EDUCATION

- 2023 Australian Awards for University Teaching, Award for programs that enhance learning – student experiences that support diversity and inclusive practices. Awarded to Associate Professor Melissa Crowe, Dr Diana Mendez and Associate Professor Meryl Churchill for the JCU Cohort Doctoral Studies Program.
- 2023 Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Stanner Award – Dr Janine Gertz, national award for best academic manuscript submitted by an Aboriginal or Torres Strait Islander author.
- JCU Singapore awarded the EduTrust Star for the third time (2023) by the Singapore Government.

5 GENDER EQUALITY

- International Association of Maternal Action and Scholarship (IAMAS), University level Award for Associate Professor Melissa Crowe and Dr Diana Mendez, for outstanding achievements in supporting mother scholars to undertake and complete research degrees, awarded for their work in the University's Cohort Doctoral Studies Program.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

- 2023 Queensland Young Tall Poppy Science Award – Dr Melanie Finch WOMESA President, Geoscience lecturer.
- Singapore Computer Society (SCS) Splash Award 2023 Finalist, The Vision X JCUS Bachelor of Information Science student team Keoborany Houv, Hsu Myat Mon, and Hpone Myat Min.

10 REDUCED INEQUALITIES

- 2023 Australian Award for University Teaching - JCU Cohort Doctoral Studies Program – Student experience that supports diversity and inclusive practices.

11 SUSTAINABLE CITIES AND COMMUNITIES

- Best Paper at the 83rd Annual Meeting of the Academy of Management in Boston, awarded to the JCU Singapore Sustainability Research Cluster.
- JCU Singapore campus awarded the Green Mark Healthier Workplace (GMHW) Gold Award from the Singapore Health Promotion Board.
- JCU Singapore campus awarded Eco Office Champion Certification from the Singapore Government Environment Council.

13 CLIMATE ACTION

- 2023 Australia Day Honours Adjunct Associate Professor Adam Smith, Australia Day Award from Townsville City Council in recognition of his work relating to the environment and sustainability.
- JCU Singapore awarded Yellow Flame Award at the School Green Awards (SGA) 2023.

14 LIFE BELOW WATER

- Australian Academy of Science Honorary Awards 2023 – Suzanne Cory Medal to Professor Terance Hughes FAA - The Frontlines of Coral Bleaching.
- Australian Marine Sciences Association – Emerging Leader in Marine Science Award 2023 – Dr Sue-Ann Watson, College of Science and Engineering.

15 LIFE ON LAND

- 2023 Australia Day Honours Member of the Order of Australia, Adjunct Professor Betsy Jackes, for significant service to botany, to conservation, and to tertiary education.
- Australian Museum Eureka Prize Finalist Award for threatened plant research – JCU Australian Tropical Herbarium, mountain top flora research project partnership.
- ACTS Green Gown Awards Australia joint winner in staff sustainability champion category – Brandon Espe.

16 PEACE AND JUSTICE STRONG INSTITUTIONS

- 2023 Australia Day Honours Member of the Order of Australia Dame Carol Kidu – Hon Doctor of Letters (2017) Officer (AO) of the Order of Australia - For distinguished service to human rights, to community development, and to international relations.
- 2023 Australia Day Honours Member of the Order of Australia Former Senator Margaret Reynolds – Dip Sp Ed (1979) Companion (AC) of the Order of Australia - For eminent service to the people and Parliament of Australia, to social justice, gender equality and Indigenous rights, to local government, and to the community.

1.2.2 2023 Grants

\$1.5 million National Health and Medical Research Council Ideas Grant Award - Associate Professor Jeffrey Warner. An Australian Research Council Discovery Project grant - multidisciplinary team combining expertise from JCU: James Cook University, Australia's Departments of Biomedical Sciences and Molecular Biology and Marine Biology. Lead investigator Professor David Miller.

\$5 million National Health and Medical Research Council Synergy Grant Distinguished Professor Jonathan Golledge, Head of the Queensland Research Centre for Peripheral Vascular Disease at JCU. 100,000 Australians and 20 million people worldwide have a health problem, called abdominal aortic aneurysm (AAA), which causes approximately 200,000 sudden deaths globally per year due to rupture of the weakened artery.

Australian Research Council Discovery grant of more than \$540,000 to examine the vapour pressure deficit (VPD) - a measure of the drying power of the atmosphere. Associate Professor Lucas Cernusak is part of an international group of scientists.

North Queensland Drought Hub (TNQDH) Tropical North Queensland drought resilience Grant Scheme one of 4 to share in \$350k. The funding will support JCU in evaluating the factors of bare soil conditions, where they will use their findings to shape land management strategies and rehabilitation approaches.



2.0 Social sustainability action

2.1 SDG 3 good health and wellbeing outreach in the north Queensland community

In 2023 JCU actively strove to improve the health and wellbeing of students, staff and the North Queensland community. JCU students and staff provided 109,300 local community member appointments in health and allied health clinics in the Cairns and Townsville regions in 2023. JCU outreach services for physical and mental health were provided at record levels, particularly counselling services.

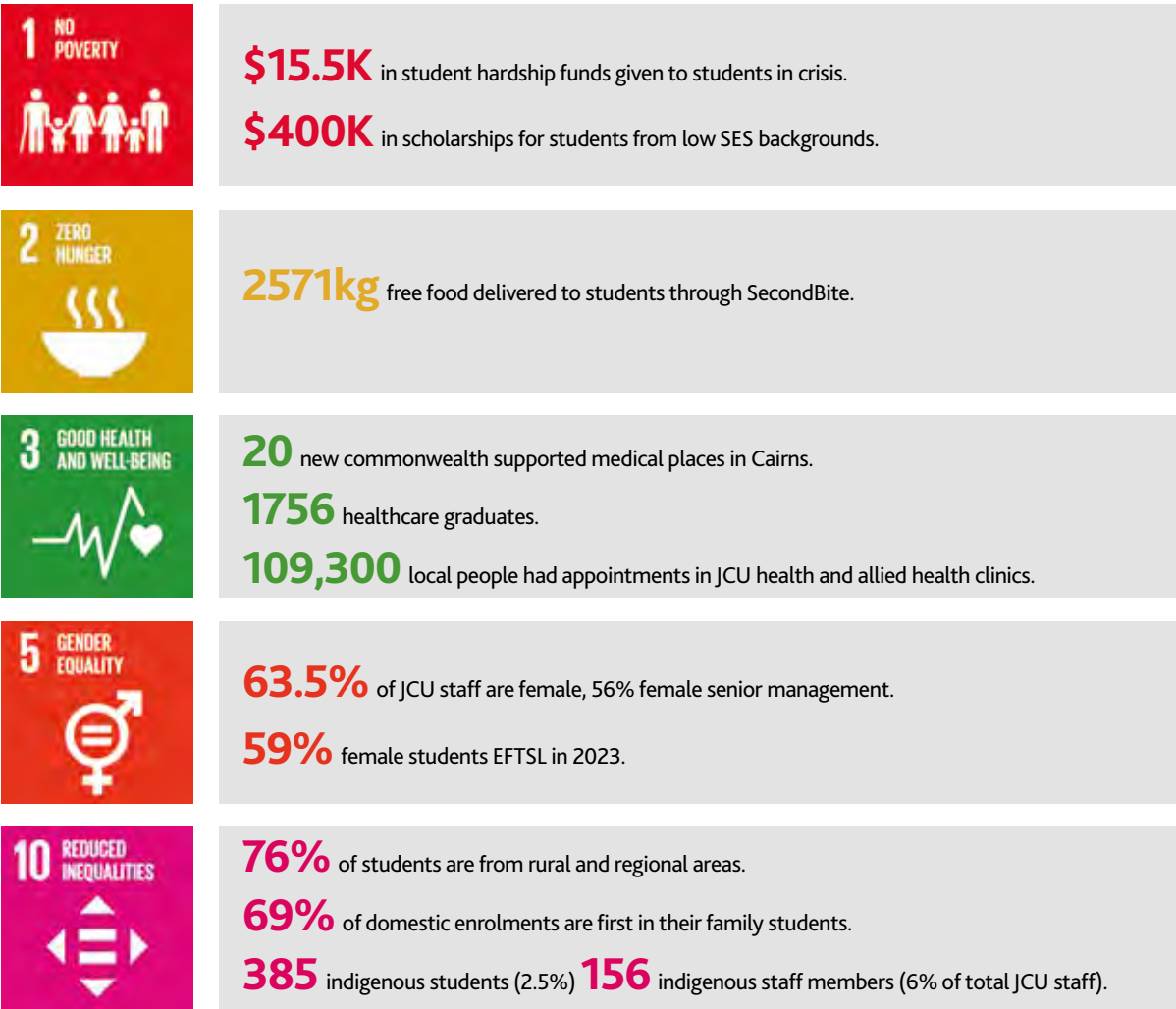
JCU students provided many hours of placement in dental, medicine, physiotherapy, psychology, speech therapy, nursing and occupational therapy at hospitals and clinics across the region. The patients that JCU students help are often from low-socioeconomic backgrounds and are struggling to afford healthcare. JCU student placements cover rural and remote areas across northern Australia including the Torres Strait where access to healthcare is limited.



Table 2.1 – Summary of JCU Health Clinic community outreach activities for 2023

Clinic Name	Clinic Appointments	Number of JCU students providing service	Notes
JCU Dental Clinic Cairns	20,329	Semester 1: 164; Semester 2: 159 84,453 hours of service	Most patients are from low socio-economic backgrounds, JCU students.
JCU Dental Clinic Townsville	9,510	Semester 1: 15; Semester 2: 16 13,839 hours of service	Most patients are from low socio-economic backgrounds, JCU students.
JCU Occupational Therapy Clinic	517	4 students provided 1,520 hours of service	OT Clinic Lead provided additional 304 hours of service.
JCU Physiotherapy Clinic	3,722	171 students - 7,089 hours of service	Clinic run by 3rd & 4th years students. Data includes massage clinic run by 1st & 2nd year students.
JCU Speech Pathology Clinic	706	54 students provided 3972 hours of service	Paediatric language and literacy, and adult social group programs were initiated.
JCU Exercise Physiology Clinic	4,918 for 275 clients	44 students provided 3,694 hours of service	-
JCU Inter-Professional Clinic	429	7 students	-
JCU Better balance clinic	836	97 students	All second and third year cohorts participated.
JCU Health General Practice Clinic	68,332	37 students, 1,700 hours of placement	Patients were 28% JCU Students, 13% from low SES backgrounds.
JCU Counselling Services	4,750 students	Qualified counsellors provide appointments for JCU students	89 emergency appointments. 6% of JCUA students accessed counselling appointments.

Figure 2.1: Social sustainability - JCU at a glance





JCU Free counselling service for students



In 2023 JCU qualified counsellors provided 4750 appointments to 1205 students, approximately 6% of the student body. There was a significant increase in emergency appointments for students in imminent risk to 89 appointments. In Australia, university students are five times more likely to be diagnosed with a mental health disorder than others (Usher, 2020). Orygen’s 2017 report Under the Radar (p. 8), identified “that more than half of tertiary students aged 16–25 years reported high or very high psychological distress while 35.4 per cent had thoughts of self-harm or suicide. JCU recognises that an increase in investment in counselling services is needed to meet the increased demand for services.

JCU also held “RUOK Day” events on both campuses in north Queensland to encourage conversations about mental health and showing support for all our community members. The Bebegu Yumba campus event was attended by the Chancellor Professor Ngiare Brown and members of the JCU senior leadership team proudly wearing yellow and showing their support for the event.

2.2 SDG 1 Cost-of-living crisis



The Good Universities Guide 2024 found that 23% of JCU students were from low socioeconomic or disadvantaged backgrounds. The cost-of-living crisis in Australia continues to exert pressure on students and increasing numbers of students are facing financial stress. Housing availability and affordability in the Townsville and Cairns region is continuing to be at crisis level and has been further impacted by flooding events.

JCU Planning researchers Associate Professor Lisa Law and Sarah Gibson published research in 2023 into housing planning in Cairns reviewing the pros and cons of medium density housing, and sustainable densification, the ability to provide more diverse and affordable housing in existing suburbs whilst maintaining high amenity, liveability, and quality of life standards. The researchers talked to developers, architects/building designers, government and industry planners, and real estate agents in Cairns about the problems and solutions.

JCU has responded with a student hardship package to relieve students in financial crisis, including providing food vouchers and a food pantry on the Cairns campus. The MOU with food rescue organisation Second bite, has also continued on the Nguma-bada campus, providing thousands of kilos of free food to students in need. In 2023 JCU provided increased research stipends for PhD candidates, to meet the increased cost of living. The stipend rate is the highest amongst all Queensland Universities and well above the base rate set by the Department of Education.

2.2.1 SDG1 Financial aid for students



James Cook university supports the most vulnerable students through the JCU Access Fund, which provided over \$319,000 to 91 students in 2023. 214 Aboriginal and Torres Strait Islander students received scholarships in 2023. These scholarships, which

Table 2.2 JCU HEPPP Participation performance for underrepresented student groups in 2023.

PARTICIPATION (INCL. RETENTION/SUCCESS) - Participation: The activity primarily consists of support for existing higher education students to remain enrolled and engaged in their studies (e.g. academic support, mentoring, targeted wellbeing support, ongoing scholarships).				
Performance Measures	Definitions	Target 2023	Final Result 2023	Commentary on 2023 Full Year Result
Australian Aboriginal and Torres Strait Islander Student Participation (%) UG	Total % of Undergraduate (excluding Enabling) Australian Aboriginal and Torres Strait Islander students enrolled at the University, on the following campus locations: Townsville, Cairns, Mount Isa, Thursday Island and Mackay. % Reported to 2 decimal places. % of Domestic Enrolments. Source = Cognos [KPI / PI / OPT - Student Report].	6.76%	6.54%	Some minor updates to student data have changed historical results (i.e. past and current students updating their Indigenous status to be identified as Indigenous).
Low SES Student Participation (%) UG	SES means 'Socioeconomic Status'. Total % of Undergraduate (excluding Enabling) Low SES students enrolled at the University, on the following campus locations: Townsville, Cairns, Mount Isa, Thursday Island and Mackay. % Reported to 2 decimal places. % of Domestic Enrolments. Source = Cognos [KPI / PI / OPT - Student Report].	25.00%	27.61%	Government changes to postcode concordance in relation to boundaries of SES has impacted results and changed historical data.
Regional and Remote Student Participation (%) UG	Total % of Undergraduate (excluding Enabling) Regional and Remote students enrolled at the University, on the following campus locations: Townsville, Cairns, Mount Isa, Thursday Island and Mackay. % Reported to 2 decimal places. % of Domestic Enrolments. Source = Cognos [KPI / PI / OPT - Student Report].	90.00%	86.18%	Government changes to postcode concordance in relation to boundaries of Metro / Regional / Remote areas has impacted results and changed historical data.

are administered by JCU, were funded by JCU, Commonwealth Government, industry and philanthropic partners totalling over \$400,000 in 2023. Additionally, the University has created a Student Hardship Fund for students experiencing financial stress, and in 2023 the Counselling team assisted 31 students with a total of \$15,500 worth of hardship grants.

2.3 SDG 5, SDG 10 Reduced inequalities, celebrating diversity, equity and inclusion



JCU continues to make progress towards the sustainability goals of gender equality and reduced inequalities through encouraging female students in non-traditional study areas, and by striving to provide a safe, respectful environment for all students free from discrimination. JCU was ranked #3 in Australia for Equity and Access, by the AFR Best Universities ranking for 2023. JCU carefully monitors demographics of student enrolment, retention and graduation, and staff gender ratios. Through outreach programs across Queensland JCU actively encourages Indigenous students and rural and remote students to enrol at JCU and provides a full package of culturally focused support



including academic support staff, bridging courses and financial assistance to assist on their academic journey. Each year JCU reports on its progress towards its institutional equity targets through the Higher Education Participation and Partnerships Program (HEPPP). JCU reports on progress towards student pre-access, access and enrolment, participation and attainment outcomes for Aboriginal and Torres Strait Islander students, students from low SES backgrounds and students from regional and remote areas.

In 2023 JCU celebrated diversity in the student and staff community through events including Wear it Purple Day on the Friday 25th August 2023, celebrating the LGBTQIA+ youth to demonstrate that they are seen, supported and respected at JCU. Harmony Day, International Women's Day, NAIDOC Week, Disability Action Week, IDAHOBIT Day (International Day Against Homophobia, Biphobia and Transphobia) are also celebrated by events on JCU campuses each year.

In May 2023, JCU officially opened the Bebegu Yumba Townsville campus Rainbow Lounge providing a place for LGBTQIA+ students and their friends to meet and follows the opening of the Ngumbada Cairns campus Rainbow Lounge in 2022. Diversity information and training for staff is provided by the JCU Human Resources team including optional modules Aboriginal and Torres Strait Islander Cultural Awareness, Cultural Inclusion, Cultural Awareness, Gender Equity and Equal Opportunity.

Gender Equity at JCU



JCU is committed to developing and maintaining a safe and inclusive workplace free from discrimination, harassment, and bullying. JCU acknowledges that organisational excellence is dependent upon our ability to harness the benefits of a diverse workforce and works hard to address systemic barriers. Gender equity has been a key area of focus for JCU over the last decade. Despite previous efforts, there is still considerable work to be done at JCU to improve gender balance in employment and promotional opportunities for female

staff, particularly in STEM areas of the University. JCU's Bronze accreditation under the Athena Swan program enables JCU to refocus effort to improve gender equality across four key touchpoints in the careers cycle, Recruitment, Retention, Career Progression and Promotion, and Governance and Implementation.

A central part of JCU's journey to improve gender equity is improving JCU staff members' awareness and understanding of issues around gender equity. The JCU Culture and Capacity team provide staff with an online course on gender equity, developed by SBS, as an introductory overview featuring real stories from diverse people. The content seeks to provide an introduction to some of the challenges faced by individuals and organisations seeking to improve gender equity in the workplace.

In accordance with the requirements of the Workplace Gender Equality Act 2012, JCU lodges a public report with the Workplace Gender Equality Agency (WEGA) each year. JCU published the 2023 WEGA reports, compliance letters and workplace profile results on the Human Resources Team webpage. In 2023, JCU University Executive senior management group, was made up of 9 members, 5 female members and 4 male members.

JCU Gender Equity Action and Research (GEAR)



GEAR Forums provide an opportunity for the GEAR team to update the JCU community on JCU's actions towards gender equity, and to provide a space where women are welcome to raise and discuss equity issues that are important to them and share their views and experiences.

GEAR held two forums in 2023, coordinated by Dr Ryl Harrison, furthering JCU's SAGE (Science in Australia Gender Equity) membership and Athena Swan Bronze accreditation awarded to JCU in 2020. The GEAR team are developing two Cygnet projects led by Associate Professor Karen Joyce, Leadership and Culture in the College of Science and Engineering, and Professor Stewart Lockie on academic promotions.



Supporting mothers - University's Cohort Doctoral Studies Program



On 12 March, the International Association of Maternal Action and Scholarship (IAMAS) announced that JCU's Associate Professor Melissa Crowe and Dr Diana Mendez had been awarded first place in its University Level Award. This award recognises outstanding achievements in supporting mother scholars to undertake and complete research degrees and was awarded for their work in the University's Cohort Doctoral Studies Program.

The Cohort Doctoral Studies Program has supported 30 mothers of school-age children or younger to complete a research degree and is currently supporting a further 32 mothers. Most of these mother scholars are working part or full time in addition to studying and raising a family. The success of the mother scholars is evidenced in the 135 peer-reviewed publications, \$2.7 million grant income and 5 joint mother publications that have been produced by this group.

2.3.1 SDG 5, SDG 10 Commitment to enhancing diversity, equity, and inclusion



Each year JCU awards the JCU Citation for Sustained Commitment to Enhancing Diversity, Equity, and Inclusion to deserving staff. This award recognises and rewards the sustained contributions of individuals or teams to the development of initiatives or programs that address the University's strategic goals around diversity and inclusion and/or have made a significant contribution in supporting staff or students overcome such barriers.

The JCU Inclusive and Accessible LearnJCU site Award recognise LearnJCU site designs that provide accessible and engaging learning materials, demonstrate principles of Universal Design for Learning and develop a learning community.

2023 JCU Inclusive and Accessible LearnJCU site Award recipients:

- Frances Cochrane, College of Healthcare Sciences, or the subject site SL3004: Acquired Language Impairments

- Dr Brian Law, College of Healthcare Sciences, for the subject site PY4203: The Psychology of Health, Wellbeing, and Resilience

The Inclusive Practice Awards recognise the efforts made by staff to be flexible, consultative, proactive, and/or innovative in minimising the challenges for students studying with a temporary or permanent disability, injury, illness or health condition. Recipients are from nominations submitted by students registered with AccessAbility Services. In 2023 27 JCU staff members and teams were recipients of the JCU inclusive Practice Award.

2023 JCU Inclusive Practice Award recipients:

Cairns

- James Dalitz - CEE
- Carolyn Diedricks - CSE
- Natasha Garvey - CEE
- A/Prof Karen Joyce - CSE
- Teneille Hielscher - IERC
- Melissa Mallie - IERC
- Dr Aileen Traves - CMD

Townsville

- Dr Helma Antony - CPHMVS
- Louise Brown - CHS
- Sarah Burke - IERC
- Allan Carman - CEE
- A/Prof Mark Chong - CASE
- Frances Cochrane - CHS
- Dr Melissa Crowe and the Cohort Doctoral Studies Team - GRS
- A/Prof Chris Davies - CBLG
- Dr Neil Dunbar - CBLG
- A/Prof Jamie Fellows - CBLG
- Andrea Geary - IERC
- Myles Menz - CSE
- Lyn Munns - IERC
- Roger Newman - CHS
- Loren Parker - Queensland Health
- Salomé Pretorius - CBLG
- Dr Sophie Raynor - CSE
- A/Prof Donna Rudd - CPHMVS
- Trisha Telford - CASE.

2.4 SDG 10 Reconciliation and celebrating Aboriginal and Torres Strait Islander contributions

Reconciliation Action Plan 2023-2025



As at the end of 2022, JCU had around 19,900 students studying at all JCU locations and 15,400 studying in Australia. JCU had 702 domestic students (5.3%) identifying as Aboriginal and/or Torres Strait Islander. JCU had 4,200 staff located at our northern Queensland campuses and 147 identifying as Aboriginal and/or Torres Strait Islander. The region is home to many Aboriginal and Torres Strait Islander people, the First Peoples to this country, who have collectively accumulated knowledge, traditions and values that reflect the wisdom of their ancestral lines going back some 60,000 years.

The University's business includes education, research, employment, and training priorities to ensure the quality and capabilities of a future workforce can help Indigenous communities and organisations to progress their self-determination plans. In 2023 JCU's Indigenous Action Group (IAG) launched its third Innovate Reconciliation Action Plan (RAP) stating the University's principles and commitment to Reconciliation, and reminding the community of JCU's reconciliation journey and achievements. The actions and deliverables of the RAP are organised into:

- **Relationships** - Our leadership teams will build enduring relationships with Aboriginal and Torres Strait Islander people, demonstrate a commitment to social justice and the reconciliation process, and ensure Indigenous self-determination priorities are supported and reflected in our core business.
- **Respect** - Our leadership teams will ensure the workplace is free of racism and prejudice against the First Peoples, integrate co-design principles for working with Indigenous communities into courses, and normalise for both staff and students' understandings of the significance of 'Place' (the traditional knowledge of the Country we are on).

- **Opportunity** - Our leadership teams will promote and showcase what productive practice looks like when working with the First Peoples, to graduate professionals who can work confidently and successfully with the First Peoples in our regions and achieve a level of relevance to the progress of improvements for Indigenous peoples in our region.
- **Governance** - Our RAP deliverables will be monitored by the IAG and updates provided to the University's governance bodies and external stakeholders, on an annual basis. This monitoring and reporting is central to identifying achievements and where there may be challenges to achieving objectives of the RAP.

Reconciliation through Research celebration



The TNQ Drought Hub was delighted to partner with JCU Tropical Indigenous Ethnobotany Centre, the Australian Tropical Herbarium and the CSIRO to hold an event celebrating Reconciliation through Research. Around 40 people attended the Reconciliation event which featured short, informal talks from Indigenous and non-Indigenous researchers and scholars, who showcased projects that bridge Traditional and Western knowledge systems through mutually beneficial and respectful partnerships to deliver great science. Speakers included:

- Dianne Cadet-James, Healthy Ageing Research Team, College of Medicine and Dentistry
- Gerry Turpin, Tropical Indigenous Ethnobotany Centre
- Professor Darren Crayn, Director, Australian Tropical Herbarium
- Fiona Smallwood, Project Officer, Indigenous Science and Engagement, CSIRO
- Dr Pethie Lyons, Research Scientist, Collaborative and Indigenous Science, CSIRO
- Dr Nick Piper, Linguist, Mer Island
- Dr Phurpa Wangchuk, Senior Research Fellow, AIITHM.

Many of the speakers touched on the importance of engaging deeply with First Nations people around research and including Indigenous researchers. They also discussed the deep levels of knowledge and understand that First Nations people have with country. Torres Webb

was the MC and also kept the crowd entertained musically also featuring Senior Indigenous Ethnobotanist Gerry Turpin and special guest Indigenous writer, filmmaker, musician and consultant applying traditional knowledge in a contemporary context, Victor Steffensen.

National Reconciliation Week 2023



The 2023 National Reconciliation Week was hugely significant for JCU with the investiture of our new Chancellor, Professor Ngiare Brown being held during this week. Chancellor Professor Ngiare Brown is the first female and first Indigenous Chancellor of James Cook University. She was elected as the sixth Chancellor of the University in January 2023, commencing in April 2023. She is also the second member of the University's alumni to take up the role. A proud Yuin Nation woman from the south coast of New South Wales, Professor Brown is a senior Aboriginal medical practitioner with qualifications in medicine, public health, and primary care, and has studied bioethics, medical law and human rights.

Eddie Koiki Mabo Lecture Series



The annual Eddie Koiki Mabo Lecture was again held during National Reconciliation Week in 2023. Professor Tom Calma gave the Eddie Koiki Mabo Lecture titles: The Voice: How the Final Co-Design Report Enables an Effective Design for Indigenous Advice to the Parliament and Executive Government. JCU celebrates the history-making Mabo decision with the long-established Eddie Koiki Mabo Lecture Series, an annual public commemorative presentation by a prominent person who has made a significant contribution to contemporary Australian society. It commemorates Edward (Eddie) Koiki Mabo (1936-1992), a Torres Strait Islander whose campaign for Australian Aboriginal and Torres Strait Islander land rights led to a landmark decision in the High Court of Australia on 3rd June 1992 that overturned the legal fiction of terra nullius, which had characterised Australian law with respect to land and title since the voyage of Captain James Cook in 1770.

Indigenous Voice to Parliament



JCU actively encouraged the community to get involved in the Indigenous Voice to Parliament Referendum by creating an informative website with a large range of resources for the JCU community to become well informed about the vote. Several events were held on the JCU campuses to encourage community discussion around the debate.

On Friday 2nd of June, JCU held a community panel event in front of the Eddie Koiki Mabo Library. The event was attended by Principal Research Fellow at JCU's Indigenous Education and Research Centre Associate Professor Sana Nakata, University of New South Wales Pro Vice Chancellor Society Scientia Professor and Uluru Dialogue Co-Chair Professor Megan Davis, and Mayor of Yarrabah Aboriginal Shire Council Cr Ross Andrews. After the referendum JCU Vice Chancellor Simon Biggs contacted the JCU community:

"Today, we convey our strong and enduring support for Aboriginal and Torres Strait Islander students, colleagues and members of the communities that JCU serves. The outcome of the referendum has closed the option of establishing a Voice to Parliament that many people had hoped would enable the Government to better gain the advice of First Nations people on matters that affect First Nations people. For our University, our primary responsibility is here in northern Queensland, a region that is home to many significant First Nation communities. Our role as a civic university in engaging our community, delivering education and undertaking research in ways that enables the aspirations of all people and takes our nation forward is more important than ever before There is much to be done."

JCU pledges in 2024 to hold forums to bring together researchers and the community to discuss Indigenous self determination. JCU pledged to hold a "After the Vote" forum to bring together academic and community speakers with a focus on northern Queensland to examine where Australia has come from and what's next for First Nations' self-determination, voice, treaty and truth.



Eddie Koiki Mabo lecture 2023 - Vice-Chancellor Prof Simon Biggs, Chancellor Prof Ngiare Brown, Prof Tom Calma, Deputy Vice-Chancellor Prof Martin Nakata



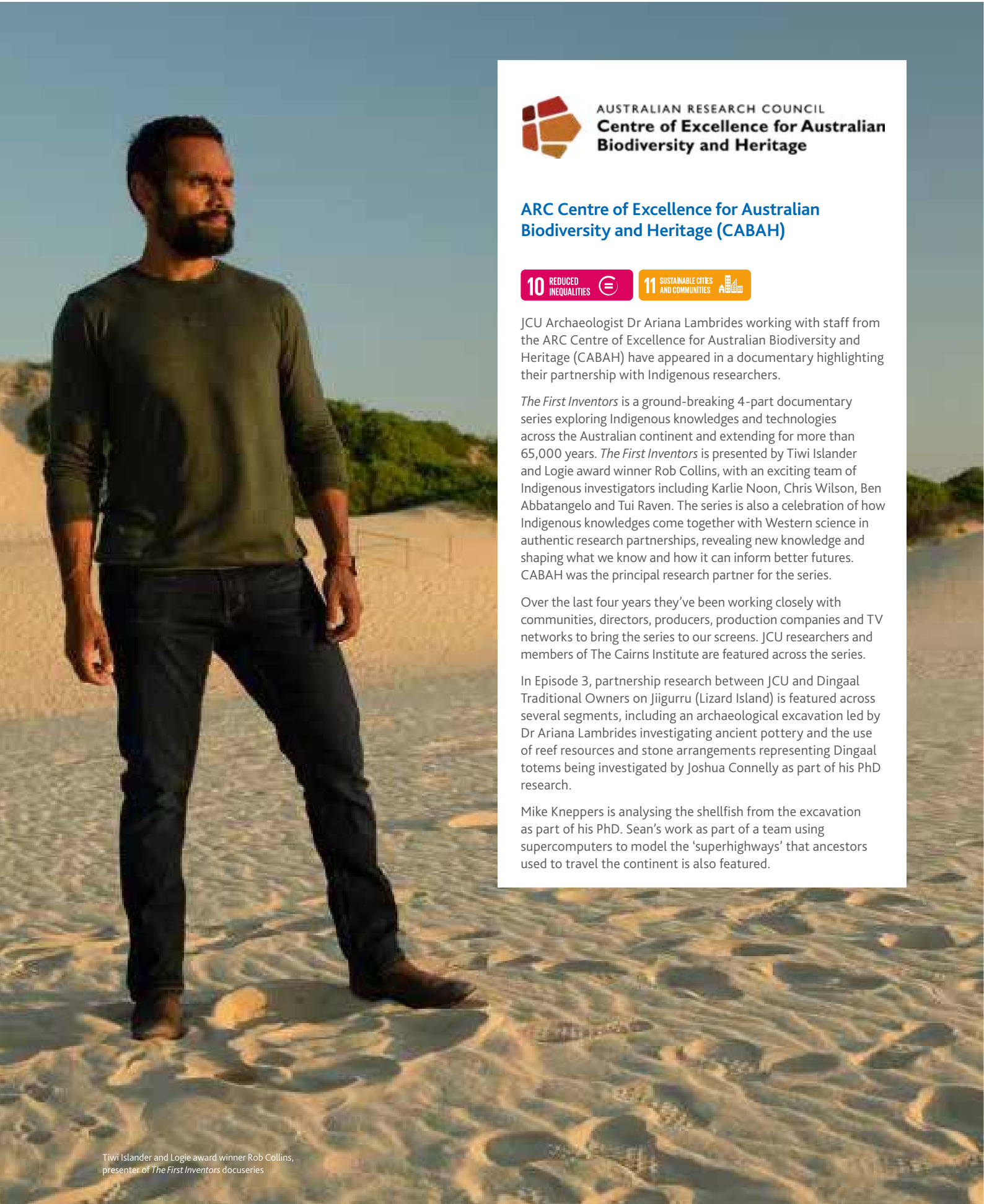
Reconciliation through Research celebration



Indigenous Voice to Parliament community panel held at JCU



JCU Indigenous students Graduation Cultural Sashing Ceremony December 2023



AUSTRALIAN RESEARCH COUNCIL
Centre of Excellence for Australian Biodiversity and Heritage

ARC Centre of Excellence for Australian Biodiversity and Heritage (CABAH)



JCU Archaeologist Dr Ariana Lambrides working with staff from the ARC Centre of Excellence for Australian Biodiversity and Heritage (CABAH) have appeared in a documentary highlighting their partnership with Indigenous researchers.

The First Inventors is a ground-breaking 4-part documentary series exploring Indigenous knowledges and technologies across the Australian continent and extending for more than 65,000 years. *The First Inventors* is presented by Tiwi Islander and Logie award winner Rob Collins, with an exciting team of Indigenous investigators including Karlie Noon, Chris Wilson, Ben Abbatangelo and Tui Raven. The series is also a celebration of how Indigenous knowledges come together with Western science in authentic research partnerships, revealing new knowledge and shaping what we know and how it can inform better futures. CABAH was the principal research partner for the series.

Over the last four years they've been working closely with communities, directors, producers, production companies and TV networks to bring the series to our screens. JCU researchers and members of The Cairns Institute are featured across the series.

In Episode 3, partnership research between JCU and Dingaal Traditional Owners on Jiigurru (Lizard Island) is featured across several segments, including an archaeological excavation led by Dr Ariana Lambrides investigating ancient pottery and the use of reef resources and stone arrangements representing Dingaal totems being investigated by Joshua Connelly as part of his PhD research.

Mike Kneppers is analysing the shellfish from the excavation as part of his PhD. Sean's work as part of a team using supercomputers to model the 'superhighways' that ancestors used to travel the continent is also featured.

2.5 Social sustainability on JCU Singapore campus

Planning sustainable and inclusive communities



JCU researcher Associate Professor Taha Chaiechi led a study of urban planning policies in Singapore through the "Community empowerment, transformative growth, and building a resilient economy" flagship of JCU's Centre for International Trade and Business in Asia (CITBA). This research flagship focuses on addressing the inadequacies of traditional methods for managing external risks such as climate change, public health emergencies, and economic growth. The study found that effective ageing planning policies require a collaborative governance structure that involves diverse stakeholders. The study, "Silver cities: planning for an ageing population in Singapore" assessed Singapore's urban planning policies for the ageing population against the WHO framework for age-friendly cities. The research focused on the Kampung Admiralty project, a pioneering development combining housing, healthcare, and commercial facilities for seniors in one location. While Kampung Admiralty served as a case study for evaluating the opportunities and challenges in urbanisation planning for the ageing population in Singapore, the study concluded that inclusive and liveable built environments could be created by emphasising multi-collaborative policymaking in other ASEAN tropical cities as well.

James Cook University launches an SDG wall at its Singapore campus



James Cook University's Singapore campus proudly features an SDG Wall, emphasizing the university's commitment to the United Nations' Sustainable Development Goals (SDGs). This dynamic installation highlights all 17 goals, including climate action, quality education, and clean water, and serves as a central hub for promoting sustainability and engaging the campus community. Located on level two, the SDG Wall not only showcases JCU's achievements and ongoing efforts related to these global objectives but also acts as an educational tool for students, staff, and visitors. By incorporating this feature wall, James Cook University reinforces its dedication to environmental stewardship and aligns with both local and global sustainability efforts, contributing to a more sustainable future.



Student Volunteer Club + Habitat for Humanity



James Cook University Singapore is dedicated to aligning its operations with the United Nations' Sustainable Development Goals. Student leaders in clubs and societies play a pivotal role in organizing activities that contribute to these goals. A notable example is our collaboration with Habitat for Humanity Singapore.

Through our involvement in "Project HomeWorks," our student volunteers actively work to alleviate challenging housing conditions in Singapore. This initiative aligns with the first Sustainable Development Goal: "End poverty in all its forms everywhere." By participating in home improvement tasks, our volunteers help to create safer, healthier, and more dignified living environments for vulnerable individuals and families.

Our efforts not only contribute to addressing poverty but also foster a sense of community and social responsibility among our students. By working alongside Habitat for Humanity, we are making a tangible difference in the lives of those in need.

JCU Singapore Purple Parade



The Purple Parade is a unifying national platform to promote awareness and celebrate abilities of Persons with Disabilities. The core of The Purple Parade movement is to ensure that Persons with Disabilities are included in the main chapter of Singapore's growth and have equal access to education, employment, transport, and social networks. The vision is for the spirit of the movement to continue for many more years to come ensuring that Persons with Disabilities to be fully included, valued, and celebrated in our country.

This ground-up movement is spearheaded by various organisations from the People, Public and Private sectors, and supported by the Central Singapore Community Development Council (CDC) and The Purple Parade Limited (TPPL).

On 4 November, JCU Singapore proudly supported the Purple Parade event. Ten of our student volunteers stepped up to assist as ushers, and students from our Music Club also performed the song "Alive" by Sia.

The Purple Parade is an initiative to raise awareness and promote inclusivity for persons with disabilities. This year's event saw an incredible turnaround with 13,000 participants, 210 participating organisations and 1,300 purple-hearted volunteers.



Top left: JCU's UN Sustainable Development Goals support wall. Bottom left: Habitat for humanity JCU volunteer students. Right: JCU's Purple parade.



3.0 Quality Education SDG 4

3.1 SDG 4 Transformative education



2023 Australian Awards for University Teaching

The 2023 AAUT Award for Programs that enhance learning – student experiences that support diversity and inclusive practices, was awarded to Associate Professor Melissa Crowe, Dr Diana Mendez and Associate Professor Meryl Churchill for the JCU Cohort Doctoral Studies Program.

The program provides a structured ecosystem of support comprising research training, academic mentoring, networking, peer-assisted learning and pastoral care enabling working health professionals to complete a research degree with translatable outcomes for industry.

Analysis of program outcomes reveals that Cohort candidates not only generate more research publications and complete their studies more expeditiously compared to their non-cohort counterparts, but it has also shown notable success in providing support to underserved groups. These include part-time and external candidates, mothers pursuing research degrees, and First Nations research candidates.

2023 JCU Citations for outstanding contributions to student learning

Each year JCU recognises individuals and teams that have demonstrated sustained commitment to enhancing the student experience, curriculum innovations and transformative approaches to learning and teaching. These outstanding staff are recipients of JCU Citations for Outstanding Contributions to Student Learning.

2023 JCU recipients were:

- *Overall winner* - Dr Sandra De Cat and Chris Gardiner, College of Public Health, Medical & Veterinary Sciences, for Sheep Week: 15 Years of collaborative partnerships using holistic experience and reflection to actively inspire veterinary students for a career in rural sheep practice.
- Dr Caroline Wong, College of Business, Law & Governance, for sustained student learning and success in a first-year subject through development and design of teaching resources that capitalise the strength of culturally diverse students.
- Dr Madelyn Pardon, College of Healthcare Sciences, for inspiring healthcare students to engage with challenging online content through active and differentiated pedagogy.

JCU Inclusive and accessible LearnJCU site award

This award recognises educators for their outstanding efforts in designing and developing inclusive and accessible online learning experiences.

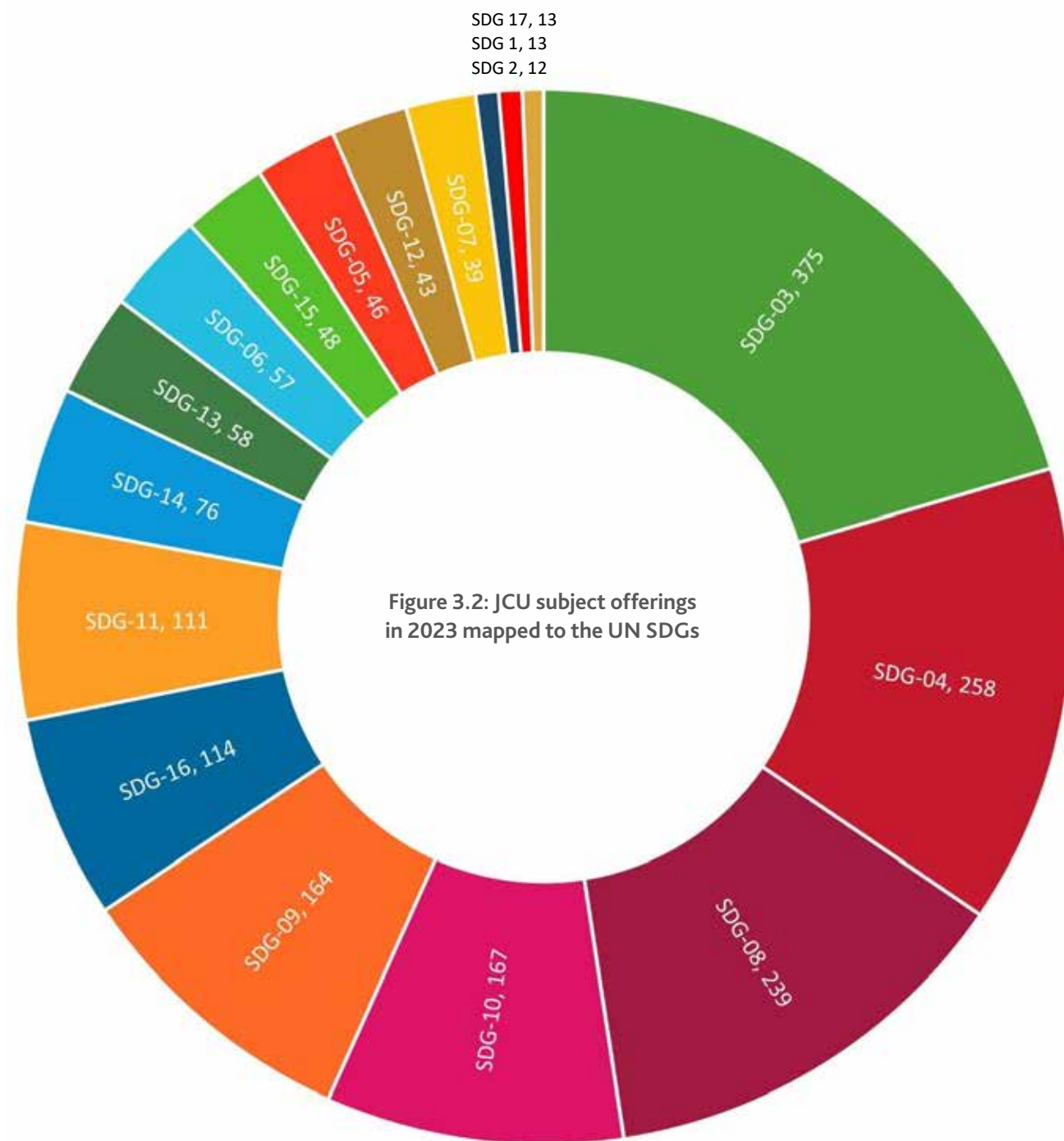
In 2023, this award recognised:

- Frances Cochrane, College of Healthcare Sciences, for the subject site SL3004: Acquired Language Impairments
- Dr Brian Law, College of Healthcare Sciences, for the subject site PY4203: The Psychology of Health, Wellbeing, and Resilience

JCU Quality Education Global Ranking 2023/2024

- JCU is ranked in the Top 21 universities in Australia, by the AFR Best Universities ranking for 2023. JCU was awarded 5 stars for full time employment, graduate starting salary, student to teacher ratio and social equity by the Good Universities Guide 2024. The JCU postgraduate study area was rated 5 stars for student support.
- JCU was ranked in the top 100 universities in the world for Earth and Marine Sciences and Hospitality and Leisure Management, and in the top 150 in the world for Agriculture and Forestry by the 2024 QS World University rankings.
- JCU is ranked in the Top 10 universities in Australia for Ecology, and in the Top 75 universities in the world for Ecology by the Shanghai Ranking Global Ranking of Academic Subjects for 2023.
- JCU is ranked #40 in the world for Environment/Ecology, by the US News Best Global Universities Rankings for 2023.





3.2 SDG 17 Sustainable Development Goals in curriculum



JCU courses are integrally linked to finding real world solutions for the complex problems raised by the UN Sustainable Development Goals. All JCU courses have learning outcomes for students that are linked to one or more of the SDGs through course content, outreach and community engagement through student placements and work experience in the north Queensland community that the university serves.

JCU Graduate Attributes Statement

The JCU Graduate Attributes Statement summaries the University's commitment to creating a brighter future for life in the tropics worldwide:

"JCU graduates are committed to lifelong learning, intellectual development, and to the display of exemplary personal, professional, and ethical standards. They have a sense of their place in the tropics and are charged with professional, community, and environmental responsibility. JCU graduates appreciate the need to embrace and be acquainted with the Aboriginal and Torres Strait Islander Peoples of Australia. They are committed to reconciliation, diversity, and sustainability. They exhibit a willingness to lead and to contribute to the intellectual, environmental, cultural, economic, and social challenges of regional, national, and international communities of the tropics."

3.3 SDG 17 Education for the UN Sustainable Development Goals

Bachelor of Environmental Science and Management



In the University's sustainability flagship course, the Bachelor of Environmental Science and Management students combine socioeconomics with environmental skills to tackle key global sustainability challenges in the environmental and socio-political context. Students learn key concepts in environmental economics and policy, human dimensions of environmental management, sustainability, and planning.

The course enables students to gain the skills to assess and manage aquatic and terrestrial species and apply concepts biodiversity assessment and management, environment practice and land and water management in specialised classes. Modern field methods are used during field-based subjects in World-Heritage listed coastal, coral reef, and rainforest environments. Students benefit from field-based studies accessing unrivalled geographical and climatically diverse landscapes, including the Great Barrier Reef catchments.

Master of Global Development



Students studying the Master of Global Development will gain key conceptual and practical skills to understand and respond to the shifting landscapes of human development and to critically analyse, evaluate and generate solutions to complex development problems.

These vary from infrastructure to systemic issues — for tropical, remote, and inter-cultural settings through informed and evidence-based methodologies. Throughout this global development degree, students learn to integrate and apply advanced theoretical and technical knowledge in global development policy and practice, ensuring your ability to make a difference at both a community and policy level.

Students learn the knowledge and skills to work in priority areas of poverty alleviation, sustainable planning, social justice, climate responsive systems, sustainable resource management and global health — areas identified by the UN as key global challenges for future sustainability.



Bachelor of Education – Science and sustainability for education



Within the JCU Bachelor of Education, Primary, students study a subject in Science and Sustainability in Education. Students gain an understanding of scientific inquiry through exploration of important socio-ecological challenges such as climate change, our energy future, water security, biodiversity conservation, food security, and human population growth and urbanisation. Pre-service teachers investigate interrelationships between environmental, social, economic, and political systems; the complex mechanisms that lead to degradation of these systems; and the resultant risks to environmental and social sustainability.

Bachelor of Education – Aboriginal and Torres Strait Islander Education



Within the Bachelor of Education students gain a strengthened respect and understanding of Indigenous student's histories, cultures and languages in classroom practice and the wider school community. Student study the impact of Indigenous student's culture, identity, history, and linguistic background to develop reflective and respectful pedagogical strategies and perspectives for Aboriginal and Torres Strait Islander students. Pre-service teachers develop their professional identity as teachers of Indigenous students and demonstrate evidence of pedagogical models and teaching strategies that are inclusive and student-centred across all curriculum areas.

Bachelor of Marine Science, Aquaculture



Students studying the Bachelor of Marine Science undertake research at the JCU Orpheus Island Research Station, and coral reef, island, seagrass, and mangrove environments. Students develop a deep understanding of marine systems while studying in JCU's advanced research aquariums and laboratories and learn how to best manage human impacts and preserve dynamic marine and coastal environments. Students focusing on the Fisheries stream examine the process of managing fisheries in tropical regions to ensure positive outcomes for fish stocks, ecosystems, and human communities. The paradigm of fisheries as linked social-ecological systems is used to develop an understanding about how biology, economics, human communities, and legislative factors all contribute to outcomes in fisheries management.



Master of Business, Economic Resilience major



In a forward-thinking move, the College of Business, Law, and Governance (CBLG) has launched a new major in the MBA program focused on Economic Resilience. This innovative major, commencing in 2024, is designed to integrate sustainability and resilience as interconnected pillars essential for success in today's business world. The MBA - Economic Resilience Major is structured to provide students with a comprehensive understanding of economic resilience through a series of core subjects.

These include Building Economic Resilience, Resilience and Sustainable Development, Disaster Response, Recovery and Re-development, and Business Continuity and Organisational Resilience. This major reflects CBLG's commitment to preparing future business leaders to navigate challenges and drive sustainable growth.

By integrating sustainability principles and resilience concepts, the MBA - Economic Resilience Major equips students with the knowledge and skills to thrive in an ever-changing environment while contributing to sustainable development.

Bachelor of Engineering



Graduates of the JCU Bachelor of Engineering can critically appraise the role and relevance of engineering in society, with specific reference to practices and priorities for creating sustainable communities and industries in the tropics. Within the chemical engineering major students study environmental impacts and sustainability. Students develop skills in life cycle assessment, pollution control technologies in air, water and land and the

philosophy, principles, and practical guidelines for sustainable development of industries. Students are made aware of their responsibilities as an engineer across safety, environment and sustainability issues and practices. Within the civil engineering major students gain skills to assess the environmental impact of large projects and understand how to build community engagement.

Master of Engineering, Electrical and Renewable Energy major



Students in the Master of Engineering, electrical and renewable energy major are introduced to the concepts behind renewable systems such as smart grid technologies, future-low carbon networks, sustainable electricity systems and the main renewable generation technologies. In this major, students learn the tools and techniques to integrate renewable energy resources into power systems and processes, and with renewable electronics and create and work within advanced electrical engineering designs.





Seagrass meadows, Green Island



JCU TropWATER and Girringun
Indigenous rangers monitoring
dugongs at Hinchinbrook Island.

3.4 SDG 4 JCU Educational Outreach

Indigenous Education and Research Centre Winter School



An innovative JCU education outreach program, the annual IERC Winter School hosted almost 100 Indigenous high school students from across Queensland and the Northern Territory on JCU's Bebegu Yumba Campus in Townsville. The annual five-day residential preparatory program dedicated to academic excellence and team-building activities hosts Indigenous students from the remotest parts of the country, including the Torres Strait Islands, Bamaga, Inverell, Alice Springs, and Darwin.

The high school students were able to choose to experience studying Law, Medicine and Dentistry, Nursing and Midwifery, Math and Science, Indigenous Studies, Social Work, Marine Science, Allied Health or Veterinary Science and Biomedicine, as well as experiencing Indigenous cultural opportunities including bush medicine and Indigenous astronomy. The JCU program covers return travel, catering and accommodation costs for the students and gives underrepresented students an opportunity to try tertiary education in a culturally supportive environment.



Indigenous high school students attending the IERC Winter School program

The Cairns Institute Aboriginal and Torres Strait Islander cadetships



The Cairns Institute Aboriginal and Torres Strait Islander cadetships provide undergraduate and honours students enrolled at JCU the chance to undertake a paid research placement related to their degree and professional development goals. As part of the cadetship, students receive employment with the Cairns Institute one day per week, reimbursement for study expenses, access to professional development and networking opportunities, and credit towards degree completion, contingent upon meeting entry and assessment criteria for relevant work integrated learning subjects.

Student scientists for a day



Scientists from the JCU Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER) provided high school students at Newman Catholic College in Cairns with a unique opportunity to advance their scientific knowledge beyond the classroom, inspiring a new generation of environmentally conscious leaders. Under the scientist's guidance, the Reef Guardian class has taken an active role in rehabilitating damaged seagrass meadows in the Cairns Inlet, while also conducting seagrass monitoring quadrat studies at Green Island.

Nauru Education Program



The Cairns Institute Research Fellow Dr Greg Burnett from JCU's College of Arts, Society and Education, spent twelve months in Nauru as an Education Advisor to the Nauru Government. The advisory role, supported by the Australian Department of Foreign Affairs and Trade's (DFAT) Australia Pacific Partnerships Platform, was to begin implementation of the Nauru Education Programme (NEP), a 10-year, \$40 million development aid project, funded by Australia. The NEP's four end of project outcomes are: to improve school enrolment and attendance, particularly in the early years, improve learning outcomes for all children, particularly in terms of literacy; new and improved secondary to post-secondary school learning pathways; and strengthened and more inclusive education system delivery generally.

3.5 SDG 4 Lifelong Learning – vocational training and community engagement



JCU engages the local community in lifelong learning opportunities including public seminars, open day events, art exhibitions, vocational training courses, and membership of the University library to access information resources. JCU has special collections that have significance to North Queensland that are available for the public to view, including Indigenous heritage, rare books, and local historical records.

The JCU College of Medicine and Dentistry's General Practice and Rural Medicine program offers Registrars in regional Queensland a diverse range of training posts in Aboriginal and Torres Strait Islander Health Service settings, offering registrars an immersive experience in the provision of comprehensive primary health care to Aboriginal and Torres Strait Islander peoples. JCU offers essential advanced skills training and extended skills training for Registrars to extend the depth and breadth of the registrar's skill base in an area relevant to primary medical care.

The JCU Economic Geology Research Centre (ERGU) delivers professional development training in fundamental and applied geoscience skills for researchers, industry, and government organisations. The ERGU team liaises with industry to develop collaborative research projects, offer relevant professional development training, and provide information resources for exploration and mining.

JCU TropWATER Institute has over twenty years of experience providing a range of training opportunities for universities, government, industry and community groups. JCU TropWATER offers environmental DNA (eDNA) workshops giving participants a fundamental, practical introduction to eDNA and an overview of best practice eDNA sampling methods and strategies tailored to their needs. TropWATER is involved in Land and Sea Indigenous ranger training programs in northern Australia. These training programs have resulted in many major on-ground monitoring and restoration projects which has not only contributed to restoring environmental values, but also returned cultural values into coastal wetland landscapes. TropWATER also offers a short course in aquatic environment monitoring skills which will improve understanding and value-adding from the perspectives of field staff, recent graduates, and experienced professionals.



Primary care at the Mt Isa Centre for Rural and Remote Health

Tropical North Queensland Drought Hub's (TNQDH) business accelerator program



The TNQDH is led by JCU and based out of the JCU Ideas Lab in Cairns, supporting farmers and communities to become more drought resilient. Over the last 12 months, the Hub has been looking for AGTech ideas to help make a positive impact for the agricultural industry within tropical North Queensland and beyond. The Hub's programs include Transformational Agricultural systems, Agricultural Innovation coordination and outreach.

The TNQDH offers agricultural training programs including a business accelerator program in partnership with agrifood tech company Farmers2Founders. The local founder teams joining the program have challenged their thinking, developed their confidence, and learnt skills to help grow their ideas and businesses. Though the Hub's network of producers, industry and government, the teams will be able to continue their commercialisation journey through trials, funding opportunities and being linked with important stakeholders. These teams are working on technologies that range from low-tech innovations that pump water runoff to rehabilitate landscapes and turning fruit and vegetable waste into by products for the animal feed industry, through to a quality assurance compliance service to help keep up to date with industry standards. Congratulations to the Harvest teams, Four Daughters and Spades and the Hone teams, Ocean Orchards, PSKL, Aqua Perception, Hillbillie Hogs, Nutriq, Custom Enzymes, GPS Trapping and Biochar for their achievements.



4.0 Research

4.1 Research for the UN Sustainable Development Goals

JCU researchers actively pursued solutions to all 17 UN Sustainable Development Goals in 2023. The largest number of research papers were published towards SDG 3 Good health and wellbeing with over 2051 papers in 2019-2023, followed by SDG 14 Life below water and SDG 15 Life on land. The field weighted citation impact (FWCI) of JCU's 2023 research output was highest for SDG 16 Peace, justice, and strong institutions, followed by SDG 2 Zero hunger, and SDG 8 Decent work and economic growth.

Dengue Fever practically eradicated from North Queensland



The release of mosquitoes containing the Wolbachia bacteria has practically eliminated dengue fever cases in North Queensland. Dr Samson Ogunlade from JCU's Australian Institute of Tropical Health and Medicine (AITHM) said from October 2014 to February 2019, local authorities in Townsville released Wolbachia-infected Aedes aegypti mosquitos – the type of mosquitoes which are responsible for spreading dengue – around the city. Wolbachia changes mosquitoes so they are less able to transmit viruses like dengue, zika, chikungunya and yellow fever. This makes it harder for viruses to reproduce. The new study developed a mathematical modelling framework to estimate this intervention's effectiveness and relative dengue transmission rates of Wolbachia-infected and wild-type mosquitoes. The research found the likelihood of a human becoming infected with dengue, if bitten by a Wolbachia-infected mosquito, is about five per cent of the risk, compared with being bitten by a wild-type mosquito. The Townsville Wolbachia release program led to a 65% reduction in predicted dengue incidence during the release period and over 95% reduction in the 24 months that followed.



Proteins in hookworm secretions identified with significant anti-inflammatory benefits

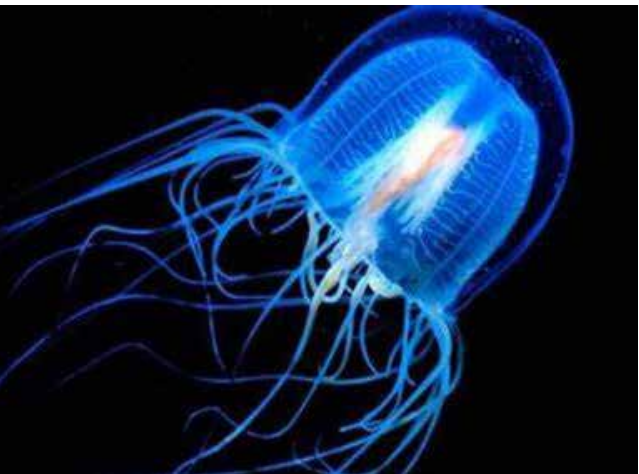


In a world first, JCU PhD researcher Dr Stephanie Ryan has identified protein families with significant anti-inflammatory benefits in hookworm saliva. The discovery paves the way for developing conventional treatment delivery, such as capsules or injections, to supersede infecting patients with live worms to achieve similar results. JCU has pioneered clinical trials into the safety and efficacy of using live hookworm infection to treat a range of conditions, including metabolic disorders, such as heightened insulin resistance – a precursor to Type 2 diabetes, as well as Inflammatory Bowel Disease. The researchers found three distinct protein leads that alleviated colitis in the mouse models, and also significantly reduced the release of inflammatory cytokines (immune-triggered molecules) in the donated intestinal tissue of ulcerative colitis patients. None of these protein families had previously been reported to have anti-inflammatory properties when produced by parasitic worms. Work will now continue on an oral delivery method to deliver these proteins and to evaluate the efficacy in clinical trials.

Irukandji jellyfish abundance in North Queensland



The highly venomous Irukandji jellyfish (Carukia barnesi) is believed to cost Australia an estimated \$15-20 million annually in sting-related medical care and over \$1 billion in lost tourism dollars when a death occurs. However, virtually nothing is known about the jellyfish, which is extremely hard to survey in its natural environment.



JCU Research Impact for the UN Sustainable Development Goals 2019-2023

Figure 4.1: JCU 2023 research total scholarly output towards the UN SDGs

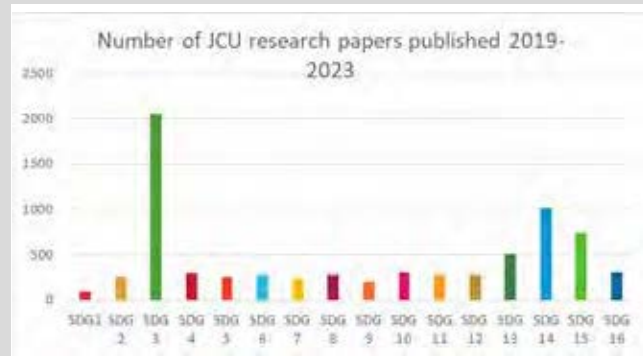
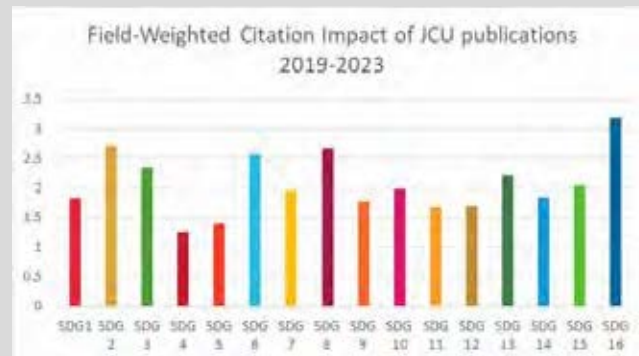


Figure 4.2: JCU 2023 research outputs rated by Field Weighted Citation Impact towards the UN SDGs



Over six consecutive stinger seasons (November 2013 to January 2019), aided by funding from the Lions Foundation, JCU researcher Dr Olivia Rowley and the Tropical Australian Stinger Research Unit (TASRU) team undertook 153 expeditions to the offshore waters of Double and Haycock Islands, where they netted a total of 960 specimens – the result of 460 hours of work. Prior to marine biologist Olivia Rowley's study, most information on the presence and abundance of the tiny (max. 30 mm) transparent jellyfish in Far North Queensland waters was based on hospital sting records – which did not include direct identification of the culprit stinger. Environmental data was also collected to study whether the abundance of the jellyfish could be attributed to specific environmental conditions.

The six-year study has created a world-first database on the presence and abundance of this venomous jellyfish in Far North Queensland waters. Whilst no correlation between abundance and the environmental conditions was determined, further work is needed on the ecology of the species so that predictive forecasting for its prevalence and location can be developed.

Challenges of malaria research in PNG



JCU PhD student, Lincoln Timinao investigated the transmission of a major, but understudied malaria parasite species, *Plasmodium vivax*, from infected humans to colony-reared mosquitoes in a laboratory setting – creating new opportunities to test potential transmission-blocking vaccines and antimalarials.

Based at PNGIMR in Madang, the researcher also relied on the support of local study participants from communities willing to donate blood to feed the mosquitoes for his study – which helped confirm that people in PNG who are infected, but asymptomatic (show no symptoms) can still transmit malaria parasites. The study established a reliable method to feed the mosquitos blood as contrary to popular belief, wild mosquitoes mainly feed on nectar. Using this feeding method, Dr Timinao was able to confirm the transmission of parasites from infected human blood to an uninfected mosquito.

PNGIMR is now equipped to play a major role in testing potential malaria transmission blocking vaccines and other antimalarial drugs, particularly for *P. vivax*, which is difficult to culture in the laboratory. It is currently collaborating with the Melbourne-based Burnet Institute and Cambridge University to test some of their vaccines. Dr Timinao is now co-investigator on a million-dollar United Kingdom Medical Research

Council study and is one of the in-country leads of an International Centre of Excellence in Malaria Research \$7 million-plus renewal application, in which JCU is a leading consortium partner.

The Journal of Resilient Economies



The Journal of Resilient Economies (JRE) is a Platinum Open Access journal, with a multidisciplinary focus to further advance the important concept of resilience. Publication, infrastructure and maintenance of JRE is fully supported by JCU Open Journal Systems (OJS), driven by the belief that knowledge has the power to change lives, and that research outputs should be freely accessible online, without barriers. The Journal of Resilient Economies actively contributes to the literature on the connection between the Sustainable Development Goals (SDGs), particularly SDG 8 Decent work and economic growth.

A new tool for reducing emissions in sugarcane irrigation – i-Rat



The JCU Agriculture Technology and Adoption Centre (AgTAC) have developed an Irrigation Rapid Assessment Tool (i-RAT) which assists farmers to understand how they can save water and electricity without a loss of yield. It uses computer modelling to allow farmers to explore several scenarios within the tool to display the changes in cost savings, gross income, and greenhouse gas emissions before making changes to their production. The product was developed in conjunction with canegrowers in the Burdekin region, which was used as the area for the first trial of the software. It has since been adopted by a leading industry body who have embedded i-RAT into their district management plan. A second phase roll-out of the tool is now underway in the Mackay-Whitsunday region.



Mornington Island, Gulf of Carpentaria



Land management practice to benefit environment and landholders



Research conducted by a team of researchers including Cairns Institute Researcher, Associate Professor Rachel Hay, provides valuable insights into enhancing the adoption of improved land management practices. By employing a transaction cost lens, the study examines factors influencing the uptake of sustainable land management techniques, shedding light on the barriers faced by landholders and the potential benefits for both the environment and landholders. These insights contribute to promoting sustainable land use practices. Through their findings, the research offers practical guidance for policymakers and land managers to overcome barriers and facilitate the widespread adoption of environmentally beneficial land management practices.

Digital inclusion in a remote Indigenous community



Cairns Institute researcher, Professor Hurriyet Babacan was part of a team that conducted a study offering insights into digital inclusion in a remote Aboriginal community on Mornington Island, focusing on

reducing inequalities in access and participation. By focusing on Indigenous methods and perspectives, the study reveals how cultural considerations influence digital choices, literacy, and connections to Country and culture. Recommendations include designing inclusive digital services and infrastructure, promoting peer-to-peer learning, and recognising the social benefits of improved digital inclusion for underserved communities.

Food Security in the Philippines



The human population of the Philippines is expected to reach 158 million by the year 2050, which implies increased demand for fish and poses the question of whether the Philippines can meet the expected increase in fish demand. JCU research has found that continued mismanagement of inland and marine fisheries will widen the already forecast gap in fish supply expected with the growing population. However, simultaneously rebuilding overfished fisheries, restoring degraded habitats crucial to supporting productive fisheries, addressing current threats to fisheries sustainability, and expanding sustainable marine aquaculture (or mariculture) have the potential to meet future fish demand in the Philippines. Sustainably expanding mariculture requires careful siting and management of mariculture development areas so that mariculture can improve food security without disenfranchising and marginalizing local coastal communities.

Gender diversity benefits in the tourism industry



JCU researcher Tiong Yang Thong from Singapore campus published an analysis of board gender diversity of firms in the tourism industry in 30 countries. The research team found that firm performance is positively associated with the proportion of female directors on a board. Corporate financial distress risk is also lower in firms with higher proportion of female directors on the board. However, the association is stronger in countries with stronger shareholder rights, countries with stronger securities law regulation stipulating disclosure of board diversity and countries with stronger economic empowerment of women. These results indicate that contextual factors, including country-level corporate governance structures and the economic empowerment of women can affect the association between board gender diversity and firm performance.



5.0 Environmental Sustainability

Protecting the diverse tropical ecosystems in which the University community lives, studies, works, travels and conducts research is key to the University's values and strategic priority: Securing our Future. Our place is in the tropics next to two world heritage areas; the Wet Tropics and the Great Barrier Reef, and we strive to reduce our environmental impact and protect these valuable regions.

The UN SDG 6 Clean water and sanitation, SDG 7 Affordable and clean energy, SDG 13 Climate action, SDG14 Life below water and SDG 15 Life on land, are the focus of many of JCU's highest ranking research outputs, course offerings and community outreach programs. JCU has many research centres and institutes devoted to environmental sustainability including:

- Centre for Tropical Environmental and Sustainability Science (TESS)
- Centre for Tropical Water and Aquatic Ecosystem Research (TropWATER)
- Tropical Futures Institute
- ARC Research Hub for Supercharging Tropical Aquaculture
- Centre for Tropical Biosecurity
- Australian Tropical Herbarium – partnership with the Queensland Government Department of Environment, Science and Innovation and the CSIRO
- Agriculture Technology and Adoption Centre (AgTAC)
- Tropical North Queensland Drought Resilience Adoption and Innovation Hub (TNQ Hub).

5.1 Environmental sustainability action on campus

JCU is committed to reducing resource consumption in energy and water, reduce waste production, protecting campus biodiversity and preventing pollution in marine and terrestrial environments. Each year JCU submits environmental action data to the Tertiary Education Facilities Management Association (TEFMA) surveys to contribute to national benchmarking of costs and performance in facilities management in higher education.

SDG 6 Water



JCU continues to carefully monitor water usage across campuses and seeks to reduce consumption in irrigation and in facilities. The 2023/2024 wet season was a heavy rainfall season for the tropical far north region, with Australia's wettest cyclone on record, Cyclone Jasper, crossing the far north coast in December 2023. Unfortunately however, JCU's water consumption increased from 384,843kL in 2022,

to 418,786kL in 2023 across Townsville and Cairns campuses combined. JCU has installed water-efficient irrigation systems in gardens and green houses, and continues to plant local native species in landscaping to reduce water requirements.

SDG 7 Energy



In 2023, JCU consumed 112,823GJ of energy, and produced 254GJ of renewable energy from solar PV systems on campus. JCU's energy is supplied by Ergon Energy, from the national grid. In Queensland on average over 2023/2024, 74% of energy provided by Ergon was generated by black coal, 8% from gas, and 17% renewable energy (10% from solar power, 5% wind power and 2% hydro power) reported by the Australian Energy Market Operator (AEMO).



Grevillea growing in The Science Place drought tolerant heath garden

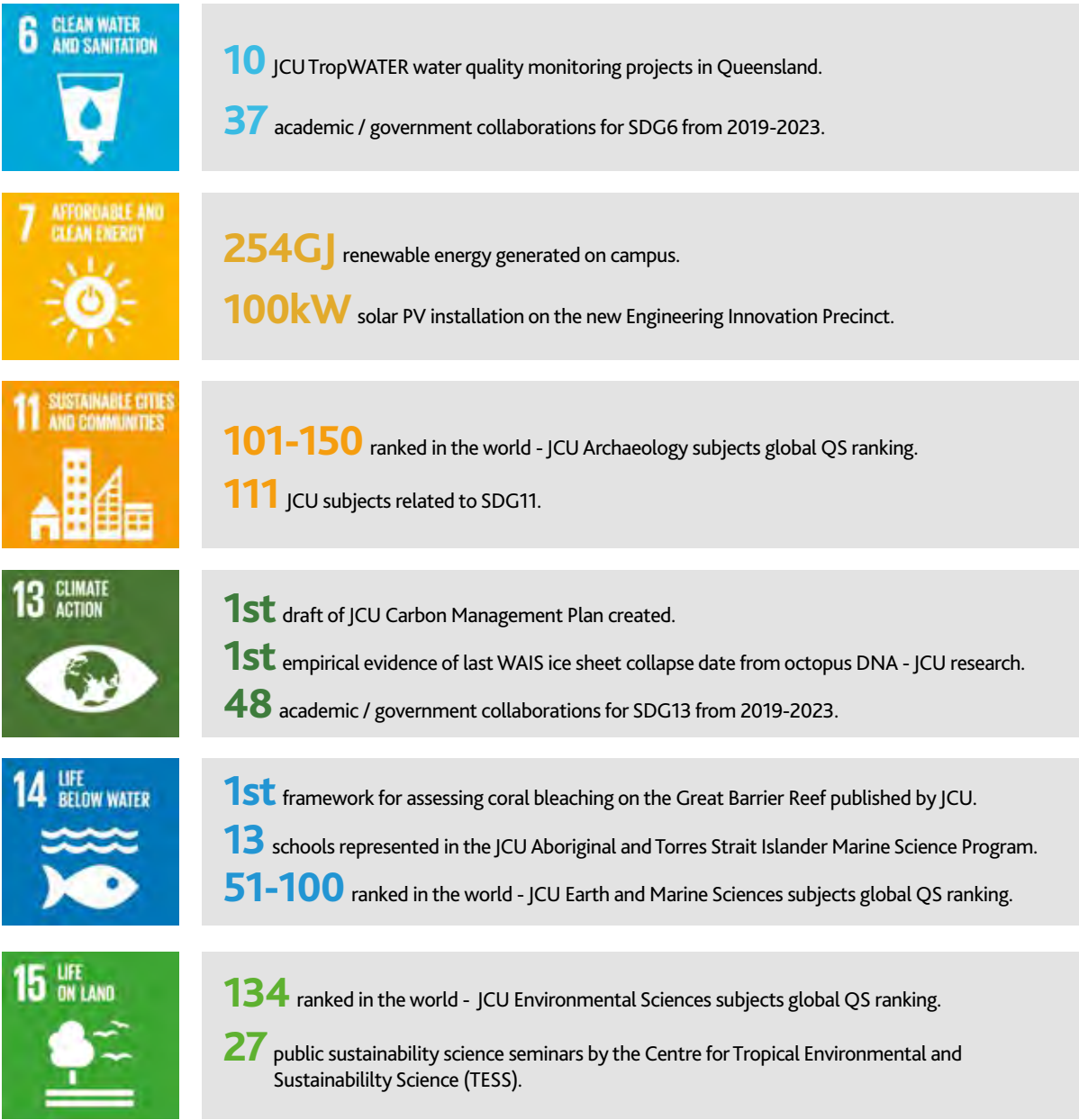


Solar PV on JCU's The Science Place roof, Douglas campus



Solar PV on JCU's Engineering and Innovation Place.

Figure 5.1: Environmental Sustainability – JCU at a glance



SDG 9 Sustainable buildings



JCU is committed to sustainable infrastructure, and all new builds on JCU campuses are built to the highest sustainability ratings. The Science Place on JCU's Bebegu Yumba campus, Townsville was the first educational building in Australia to achieve the standard of LEED Gold. LEED Gold is a standard under the Leadership in Energy and Environmental Design (LEED) international sustainable building certification program.

On the Townsville Bebegu Yumba campus The Science Place, Burralga Yumba student accommodation and the new Engineering and Innovation Place are all built to Gold LEED rating, incorporating the highest sustainability features in building materials, energy efficiency, water saving and low environmental impact design, with solar PV installations on their rooves. On JCU's Nguma-bada campus, Cairns, The JCU Ideas Lab was also designed and constructed to meet LEED Gold standards, In 2023 the construction of the new Engineering and Innovation Place (EIP), JCU's latest LEED building, was continued and it was completed and officially opened in early 2024.

Achieving Eco Office Certification - Champion Award



James Cook University Singapore has also been awarded the prestigious Eco Office Champion Certification, from the Singapore Government Environment Council, further solidifying its dedication to sustainable practices and environmental responsibility. This recognition affirms the University's ongoing commitment to environmental stewardship and its leadership in promoting a low-carbon lifestyle.

Eco Certifications are instrumental in advancing sustainability by encouraging organisations to adopt a 'One Less' mindset, reduce waste, and practice responsible consumption. As a certified Eco Office, JCU Singapore is acknowledged for its efforts in reducing carbon emissions and supporting global sustainability goals.



Achieving Green Mark Healthier Workplace (GMHW) - Gold Award



James Cook University Singapore has proudly achieved the prestigious Green Mark Healthier Workplace (GMHW) Gold Award for its offices at Block A Level 1 and Block E Level 3. This recognition highlights the University's commitment to fostering sustainable and healthy work environments.

The GMHW scheme, developed in partnership with the Health Promotion Board (HPB), presents a compelling business case for organisations that prioritise health, well-being, and environmental sustainability. By focusing on occupant health, comfort, and the implementation of supportive workplace policies, structures, and programmes, the GMHW provides a clear value proposition for green interior design and daily operations.

The incorporation of health and well-being criteria in the GMHW assessment enhances its relevance, making it more engaging for stakeholders and adding further value to the certification.



Engineering and Innovation Place



Located at JCU's Bebegu Yumba campus, Townsville, the Engineering and Innovation Place (EIP) is a new \$100 million state-of-the-art facility with new equipment, 23 new lab spaces, industry engagement and garage space, workshop, multi-modal studio, and conference rooms.

Designed by KIRK Studio, in collaboration with i4 Architecture and Charles Wright Architects, and built by BESIX Watpac, the building features a parasol roof of folded wooden panels, an innovative climate-control system, and Leadership in Energy and Environmental Design (LEED) Gold sustainability rating. JCU Deputy Vice Chancellor, Services and Resources, Tricia Brand said the modern design and function of the EIP was cutting edge, exceeds

the needs of staff and students and contains several innovative features suited to the tropical climate.

Coincidentally, there has also been a 49% increase in enrolments for Engineering this year at JCU and the EIP will no doubt enhance the learning experience for those students. Locally manufactured glulam timber is used to form the EIP's facade system, which not only provides complete cyclone debris impact resistance but achieves both abundant day lighting and transparency and thermal performance standards well beyond standard market systems – a world first for the tropics.

The EIP's atrium can also be naturally ventilated, use tempered air or a blend, acting as an intermediate cooling zone from the exterior to the interior. The surrounding areas include three water features and two feature sculptures crafted by Waanyi woman and Indigenous artist Judy Watson. The sculptures represent two brothers from the Bindal People with one symbolising Mt Stuart (Mandilgun) and the other Magnetic Island (Yunbenun).



SDG 12 Waste



JCU recycled over 125 tonnes of paper, metal, plastic and glass in 2023, through waste contractors Cleanaway and JJ Richards. Additionally, JCU actioned specialist recycling streams including 1.77 tonnes of fluorescent light tubes as they were replaced by energy efficient LED light panels. Both car batteries and appliance batteries were recycled through local council depots. 12.5 tonnes of E-waste including computers, mobile phones, printers, were recycled through ERSQ recycling services. Green waste from campus gardens was mulched or composted on site, and food scraps from staff and students kitchens across campus were transferred to the campus composting facilities by the cleaning contractor, to be given a new life in the campus gardens.

SDG 12 Sustainable transport



The JCU car fleet now boasts 5 hybrid vehicles for staff and students to hire for transport between campuses and on university business. The fleet aims to increase the proportion of hybrid vehicles in the fleet in the future as budgets allow.

The electric scooter hire service has been well utilised on the Townsville Bebegu-Yumba campus, reducing vehicle commute around campus. Additionally, the Yurika electric car charger at the Clinical Practices Building 500 has provided thousands of charges to electric vehicle owners throughout the year, encouraging sustainable transport to the campus.

The Cairns public bus fleet operated by Translink contains five electric buses which frequent the Nguma-bada campus, allowing students and staff to travel sustainability to campus. Cycling paths, bike racks and after-ride facilities including hot showers are provided on all JCU campuses to encourage students and staff to ride to campus and between buildings.

The Green Bike Fleet bike hire and mechanical services program was suspended in 2023 pending a review of funding options. It is hoped that with further investigation of funding options the program will return to operation in 2025.



Electric car charger at JCU's Central Practice Building.



SDG 15 Biodiversity and habitat conservation



JCU TropEco internship action

Enthusiastic JCU students completed habitat conservation internships with the TropEco – Sustainability in Action program in 2023. 15 students on the Bebegu Yumba Townsville campus completed weed eradication, tree planting and landscape restoration work, growing native trees in the JCU nurseries to revegetate brownfield sites on campus. The internship program provides students with a hands-on opportunity to learn about caring for the land, and protecting the biodiversity of flora and fauna on campus.

Revegetation on the Nguma-bada campus

In 2023, a partnership between the local Men's Shed group, Crankworx International Mountain Bike organisation and JCU resulted in 450 native trees planted on the JCU Nguma-bada Cairns campus. The previous year's revegetation efforts by the partnership are flourishing and growing rapidly into healthy forest thanks to a generous wet season. The native trees are sourced from seed from local trees and grown by Men's Shed volunteers, led by revegetation enthusiast Joel Groberg. Whilst monitoring the revegetation site on JCU and the adjacent Smithfield Conservation area, 3 cassowaries were seen walking through the area by the volunteers. Lumholtz's tree kangaroos have again been sighted several times on the Nguma-bada campus in the rainforest-lined creek and hills in 2023.

Koalas on campus

Koalas have been making their home on the JCU Bebegu Yumba Townsville campus, increasing the number of iconic fauna species that make their homes at JCU. The koalas have been sighted in the campus's Eucalyptus trees, creating much excitement amongst students and staff. Revegetation of areas of campus using Koala's preferred food Eucalyptus by TropEco student interns may have contributed to their return to the campus. Gradual removal of woody and herbaceous weed species including Ziziphus and guinea grass, and revegetation with native species as also continued along the Goondaloo Creek area, making progress against the infestation of weed species on campus.

Reducing Alien Species

Alien species control including feral pigs, wild dogs, cane toads, Asian honeybees has continued through 2023. Biosecurity monitoring of invasive insect species including yellow crazy ants, electric ants and pests of agricultural significance have been carried out through a partnership with Biosecurity Australia across the Cairns and Townsville campuses. No invasive insect species were located through the partnership in 2023, which has been maintained for several years as part of JCU's commitment to biosecurity for the northern Australian agricultural region.



TropEco intern planting trees at JCU Bebegu Yumba Townsville campus.



Lumholtz's tree kangaroo.



Koala.

Daintree Rainforest Observatory

The JCU Daintree Rainforest Observatory staff carried out environmental management of the canopy crane and research facility site, removing weed and pest animal species including pigs, cane toads, and cane toad tadpoles from streams. Native trees have been planted in areas that had been cleared historically to maintain the high biodiversity of the site. DRO staff carefully monitor wildlife living and moving through the property, including a pair of nesting osprey adults raising their chicks on site, their family story being relayed by “osprey-cam” to the wider community, who can follow the daily activity and development of the family. The site is home to many threatened native animal species.

Partnership to protect local wildlife



JCU and the Townsville City Council have partnered to reduce wildlife deaths on the busy roads past the campus by trialling new virtual fencing. The roadside wildlife reflectors produce flashing lights and sound in a sequential warning system that warn wildlife of approaching vehicles and has had great success in Tasmania reducing road deaths of Tasmanian Devils. JCU is monitoring the effectiveness of the new virtual fencing with remote wildlife cameras to record the effectiveness of the trial.



Boyd's Forest Dragon



Cannabullen Falls, Tully (above).
TropWATER researcher Aaron Davis working with a local farmer (left).

5.2 SDG 6 Water security in Northern Australia



Researchers from JCU’s TropWATER are investigating the challenges associated with developing water security in Northern Australia, particularly in regions celebrated for their ecological richness and diversity. Under the Water Security for Northern Australia program, and in collaboration with Charles Darwin University and Central Queensland University, targeted catchments from Western Australia to eastern Queensland, including the Gilbert River, Lower Fitzroy River, Daly River, and Ord River irrigation area are being studied.

JCU TropWATER Director Professor Damien Burrows said the amount of water needed for Australia’s agriculture will continue to grow along with the global population, and this has placed inevitable pressure on securing water from natural waterways.

Yet, while Northern Australia is recognised for its economic potential, it’s also ecologically important, renowned for vast, biodiverse aquatic ecosystems. The landscape also holds high cultural importance for Indigenous communities, who have maintained a deep connection with the land for generations.

TropWATER’s Dr Paula Cartwright said the region boasts countless wetlands with natural wet-dry seasonal cycles, housing a unique collection of fauna and flora that only exist under these conditions. Queensland’s Gilbert River catchment is one of the areas highlighted as containing critical habitats for aquatic species as well as seasonal watering holes for many terrestrial species.

Species such as freshwater sawfish are listed as endangered, whilst prawns and barramundi, both with significant recreational and commercial industries, also rely on the water connectivity between salt and freshwater systems in this catchment.



TropWATER researcher testing water quality



5.3 SDG 2, SDG 15 Partnerships with farmers for protecting ecosystems and sustainable agriculture



JCU TropWATER’s actions to improve water quality science data collection and communication in farming communities, includes 10 individual water quality monitoring projects. These projects span the Wet Tropics, Burdekin, and Mackay/Whitsunday regions. This initiative harnesses the strong rapport between on-ground extension officers and farmers and focuses on the potential impact that paddock-scale and sub-catchment scale water quality data has in directly empowering farmers in the transition to improved agricultural practices. Water quality issues impacting marine and freshwater ecosystems arise from a combination of factors, including urban development, climate change, and agriculture, with intensive farming recognised as a major contributor. TropWATER

Senior Researcher Dr Stephen Lewis said while products, including fertilizer and pesticides were essential in modern farming of sugar cane, decades of research highlights the connection between farm runoff and its impact on water quality in both freshwater and inshore marine ecosystems. It is understood that excess sediment and nutrients from farm runoff can reduce water clarity and exacerbate inshore nutrient levels causing phytoplankton blooms, persistent macroalgae outbreaks on inshore coral reefs and a loss of seagrass area and abundance. Dr Aaron Davis, TropWATER senior scientist and project lead on multiple water quality monitoring projects, said there were many farmers making great strides in improving their land management practices across the Great Barrier Reef catchment.

An initiative between the Great Barrier Reef Foundation and JCU TropWATER connects multiple on-ground projects from different Great Barrier Reef catchments, aiming to help build farmers’ trust in water quality science to ultimately facilitate change in achieving a balanced farming system. These on-ground projects focus on different strategies to improve farming practices and reduce runoff, including optimising irrigation efficiency, enhancing nutrient removal through water retention, refining fertiliser and mill

Monitoring water quality guideline thresholds on the Great Barrier Reef



JCU scientists have partnered with CSIRO researchers to research a key water quality parameter, Total Suspended Solids (TSS) in the GBR. The study stated high TSS concentrations can adversely impact coral and seagrasses on the inshore GBR. Water quality is critical for GBR health and resilience against cumulative pressures of tropical cyclones, marine heat waves, and outbreaks of crown-of-thorns starfish.

Measurements revealed that TSS is above guideline thresholds in the open coastal and mid-shelf waters for ~60% of the valid monthly observations, including wet season freshwater discharge and during the dry season. The study notes that the water quality metric used for the Australian Government’s Reef Report card uses a different monitoring method to the one explored in the study and suggests that the study’s findings can provide accurate quantitative information that can be complementary to the methods currently implemented by Marine Park management in monitoring GBR water quality.

5.4 SDG 15 Protecting threatened species



2023 Eureka Prize Finalist Award for threatened plant research

Scientists from JCU, the Australian Tropical Herbarium and the Queensland Department of Environment, Science and Innovation have partnered with Traditional Owners and botanical gardens to record, study and grow rare and threatened native plants from mountain top cloud forests in the Wet Tropics. The team was a finalist for the Australian Institute of Botanical Science Eureka Prize for Excellence in Botanical Science in 2023. Climate change is predicted to drastically modify mountain top habitats and further threaten endemic species that are already at the limit of their geographical range. The project aims to create germplasm collections as a backup for the conservation of the iconic tropical cloud forests.



Tropical Mountain Plant Science, Australian Tropical Herbarium at James Cook University. Project team in the field. Photo: Donna Davis

Northern spotted-tailed quolls

A study of north Queensland’s endangered northern spotted-tailed quolls has recommended that the population be upgraded to critically endangered status. Associate Professor Conrad Hoskin and colleagues from the University of the Sunshine Coast, found the north Queensland population had decreased significantly in the past 25 years, and is only found in six mountainous areas of the Wet Tropics. The species is currently listed as endangered in the Environment Protection and Biodiversity Conservation Act.



Quoll caught on a camera trap. Image: Scott Burnett

Lyon’s Grassland Striped Skink

JCU researchers have succeeded in discovering a critically endangered lizard that had not been found living for over 42 years near Mount Surprise. The discovery was in partnership with the Queensland Museum, and part of research in the Resilient Landscape Hub of the Australian Government’s National Environmental Science program. The team also located two other very rare reptiles; the Limbless Fine-lined Slider and the Mount Surprise Slider that have very small

distributions in north Queensland. Providing species location data lends support to government protection of the reptiles.



Lyon’s grassland skink. Image: Conrad Hoskin

Northern Bettong

JCU researchers monitoring the survival of populations of the endangered northern bettong are working with the Northern Bettong Recovery Team to maximise the genetic diversity of small populations. PhD candidate Stephanie Todd was able to identify a sub-population of bettongs with low genetic diversity which was declining and recommended a ‘mixed source’ approach to relocating individuals from multiple populations. The scientist’s advice was followed by Traditional Owners, AWC scientists and the broader Northern Bettong Recovery Team, with the recent relocation of 49 northern bettongs from across the Lamb Range.



Pair of Northern Bettongs

JCU long-term conservation project

The JCU College of Science and Engineering, in collaboration with JCU Estate, secured funding from the Queensland government to survey, assess, and cultivate some of Queensland’s rarest plants. Since 2022, they have submitted over 20 condition reports to the Queensland government to guide future actions. Additionally, more than 30 threatened species have been added to the JCU living collection. Remarkably, some of these plants had not been observed in over 20 years, and most had never been cultivated before.



Kunzea truncata, known from only a single collection in 1992, until rediscovered by TropEco, and now conserved in the JCU living collection

5.5 SDG 14 Community outreach and action for marine conservation

Australian Academy of Science Award - Professor Terance Hughes



Emeritus Professor Terance Hughes was awarded the 2023 Suzane Cory Medal Honoric Award by the Australian Academy of Science. The Academy awards recognise outstanding contributions to science and were awarded to 23 leading Australian Scientists.

The award recognised Professor Hughes’ superlative and sustained contribution to marine biology and science leadership in Australia and globally. Among his most significant research has been his ground-breaking exploration of the resilience of coral reefs to pollution, overfishing and climate change, and on the dynamics of tipping-points and regime-shifts.

Throughout his distinguished career, Professor Hughes’s research provides innovative and practical solutions for improving coral reef management and governance. He is also a Highly Cited Researcher with many publications in Science and Nature and was the founding Director of the ARC Centre of Excellence for Coral Reef Studies.



Emeritus Professor Terance Hughes



Student Stirling King checking coral embryos during JCU Spawning School

Spawning School Project – Traditional Owners and JCU TropWATER



The seven-day ‘Spawning School’ was led by JCU’s TropWATER under the Cairns-Port Douglas Reef Hub in collaboration with Reef Recruits and local Land & Sea Rangers, funded by the partnership between the Australian Government’s Reef Trust and the Great Barrier Reef Foundation. Traditional Owners studied the Great Barrier Reef annual mass coral spawning event with scientists – observing the spawning process from fertilisation to the transformation of larvae into baby corals. Project Lead JCU TropWATER’S Dr Katie Chartrand said understanding coral spawning processes and building capacity for Traditional Owners was a practical way for communities to engage and explore the science and culture and was driven by the need to integrate Indigenous perspectives with western science to understand the challenges facing the GBR.

Human rights vital for conservation



Dr Patrick Smallhorn-West is a lecturer in marine science at JCU and researcher at the Wildlife Conservation Society. He said that in some instances past conservation practices have imposed great social costs on Indigenous peoples and other local rights holders. A new paper, “Why human rights matter for marine conservation”, outlines the shift within marine conservation towards more participatory and community-based practices, balancing the preservation of nature with human rights issues such as poverty and food security.

The authors recommend greater adoption of the following three principles: Acknowledgement that all people have basic rights that must be supported and understand that conservationists are dutybound to respect those rights. Acknowledgement that increased vulnerability reduces people’s ability to adopt sustainable practices, and so securing human rights can be a good conservation investment. Understanding that conservation gains achieved through human rights violations will increase disenfranchisement, widen inequalities, potentially increase resource dependence, and heighten resistance to current and future conservation activities.



Indigenous high school students participating in the ATSIMS program

Aboriginal and Torres Strait Islanders in Marine Science (ATSIMS)



The long-running JCU Aboriginal and Torres Strait Islanders in Marine Science (ATSIMS) program to build connections between traditional ecological knowledge and western science knowledge offered a two-way learning experience for all participants. 13 state and private schools participated in the program in 2023, with Year 10 students hailing from Abergowrie, Ingham, Townsville and Palm Island's Bwgcolman Community School. ATSIMS program coordinator Dr Allison Paley said students enjoyed several activities including a trip to JCU's Orpheus Island Research Station, engagement with local Indigenous Land and Sea Ranger groups and Traditional Owners, a visit to the Australian Institute of Marine Science, and participating in mini-practical exercises at JCU's The Science Place.

Saving Sarah the Sawfish



A JCU scientist Dr Michael Grant has published a children's book aiming to teach children how to release sawfish inadvertently caught in their nets. Dr Michael Grant has been working on sawfish conservation in Papua New Guinea for a number of years. He said sawfishes are among the world's most threatened vertebrates, owing to inshore fisheries pressure, and are



Illustration from *The Wonky Tooth Sawfish* children's book.

now only regularly found in northern Australia and the southern island of New Guinea. He said it is vital population declines of the four species of sawfish in PNG waters are halted. Sawfish are particularly vulnerable to nets because their saw is easily entangled. It's common practice for fishers to amputate the saw to untangle the fish from the net. But that means the sawfish slowly starves as it needs the saw to feed.

With support from JCU and the Save Our Seas Foundation, Dr Grant along with Dr Madeline Green from the University of Tasmania, Sarah Hill of ChunkyDuck Graphic Designs, and PNG in-country research facilitator Yolarnie Amepou of the Piku Biodiversity Network have produced an illustrated children's e-book, a website with audio from the book, and posters showing how to safely release sawfish. *The Wonky Tooth Sawfish* follows the adventures of Sarah the Sawfish as she navigates from her home in an inland stream to the ocean. The book contains a narrative targeted toward children, fact pages, and diagrams of how to safely release sawfish from a net, without damaging the fish or the net. The fact pages and safe release guide are available as individual files. The authors have given these materials to some communities and had a very positive reception, and recently UK-based NGO Synchronicity Earth has got on board to further develop and disseminate these materials over the next three years.

Reef Values Social Sciences for the Reef Symposium



In collaboration with the Great Barrier Reef Marine Park Authority (GBRMPA), University of Queensland (UQ), Queensland University of Technology (QUT), Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Queensland Government, The Cairns Institute hosted the Social Science Community for the Great Barrier Reef (SSCR) 2023 Symposium. The theme of the symposium was 'Reef Values – Ecologies, communities, and connections'.

The symposium brought together local reef practitioners, government managers, and social scientists working in the Great Barrier Reef Region sharing social scientific knowledge and research about GBR communities and their values, and engaged in critical and creative thinking about what this means for GBR conservation, management, and sustainable development. The purpose of the group is to collaborate, share knowledge and provide a platform for improving understanding of social science for the GBR both research and applied.



5.6 SDG 9, SDG 15 Community outreach for innovation, conservation, and education

Shark and ray conservation JCU Singapore workshop



The Southeast Asia Shark & Ray Research and Conservation workshop, held from September 25-29 in Singapore, marked a significant milestone in regional conservation efforts. This pivotal event was co-organised by JCU's Australian and Singaporean campuses and led by Dr. Andrew Chin, Senior Research Fellow in Marine & Aquaculture Sciences at JCUA, and Dr. Neil Hutchinson, Senior Lecturer in Environmental Science at JCU Singapore.

Over five days, the workshop gathered 35 participants from 11 countries, representing 23 diverse organisations including NGOs, research institutes and universities. United in their commitment to shark and ray conservation, these participants used the workshop as a crucial platform to share knowledge, foster collaboration, and advance the conservation agenda for these vital marine species.



JCUS Shark and ray workshop participants



JCU Area 61 equipment and design specialist Wayne Morris and embedded systems specialist Russell Warburton with a 'remote control dingo' used to encourage protective behaviours in young cow mothers.

Launch of Commercial Manufacturing Accelerator Voucher Scheme



On 24 January, Queensland's Minister for Regional Development and Manufacturing and Minister for Water, the Hon Glenn Butcher MP, launched the Commercial Manufacturing Accelerator Voucher (CMAV) Scheme at JCU. The CMAV scheme will provide \$250,000 in funding to local Small and Medium Enterprises (SMEs) to access the services of the University's innovation hub, known as Area 61. JCU Vice Chancellor Professor Simon Biggs said Area 61 has proved to be an important player in JCU's innovation community, three years after it began, making unique, one-off research equipment.

Area 61 has expanded to provide a unique service to industry across northern Queensland, enabling co-design and collaboration through our rapid prototyping facility. Projects are varied from designing conveyor belts, accurately count crops for pineapple farmers to

developing technology monitoring the effects of temperature changes on ants. The unit has already been approached by SMEs looking to co-develop new 'Minimum Viable Products' (prototypes) with examples from aquaculture, medicine and minerals processing in the pipeline. JCU's Acting Dean of Research Professor Ian Atkinson said Area 61 would be providing a unique contribution to northern Queensland's innovation community through the CMAV scheme.

Big Ideas Youth Challenge



On 4 August, JCU hosted the Townsville City Council Big Ideas Youth Challenge. Coordinated by Smart Precinct NQ, the Challenge is designed to provide students with the opportunity to hear from inspiring innovators and changemakers while developing their entrepreneurial thinking and design skills. Close to 300 students from 13 schools attended the day at Central Plaza on the Bebegu Yumba campus. This is the second year JCU has hosted the event. Professor Simon Biggs, Vice Chancellor attended the morning session to welcome students, while Ms. Tricia Brand, DVC Services and Resources lent her expertise as a mentor for the afternoon, aiding the students in developing their ideas.

JCU Innovation Community and Ecosystem



JCU aims to develop a culture that supports and understands innovation and the broader innovation ecosystems in Cairns, Townsville and Singapore. Innovation is driven not just by ideas, but also by collaboration, opportunity and spaces which allow innovation to develop and flourish. The JCU Innovation team's vision is building and supporting a vibrant innovation ecosystem, which expands on existing activities and regional innovation initiatives and deepens relationships



JCU Singapore Vision X team finalist in the Singapore Computer Society Splash Awards 2023

with innovation partners regionally, nationally, and internationally. The JCU Ideas Lab on the Cairns Nguma-bada campus aims to transform the innovation ecosystem in Far North Queensland by enabling regional digital transformation to generate jobs and foster economic growth for Cairns and the broader region. The ultimate aim is to create products and processes with real commercial application that can drive economic growth and diversity for northern Australia.

JCU Singapore Students Finalists in Singapore Computer Society Splash Award 2023



JCU Singapore is proud to announce that "VisionX," a team of 3 students enrolled in the Bachelor of Information Technology program, had the opportunity to compete in the SCS Splash Awards 2023 on October 30, 2023, after securing a spot in the top 20.

The team comprises Keoborany Houv, Hsu Myat Mon, and Hpone Myat Min, who showcased their ingenuity and problem-solving skills in their project submission. In line with this year's theme, "Building Resilience with Technology," their creative approach to addressing essential questions concerning Singapore's societal well-being and development was commendable. The team proposed a mobile solution for the visually impaired community that uses Artificial Intelligence (AI) for real-time image detection and voice guidance in navigating their surroundings. In addition, the solution also aims to pair the visually impaired with volunteers in their last-mile commute.

Celebrating its 20th anniversary, the SCS Splash Awards remains Singapore's longest-running technology competition for students. This year, the competition has expanded, allowing more students from pre-tertiary and tertiary institutions across Singapore increased opportunities to present their technological innovations. There were 115 teams and a total of 345 students participated in the SCS Splash Awards 2023. This year's challenge theme "Building Resilience with Tech" encouraged

participants to explore and harness generative artificial intelligence (AI) in their projects to solve thought-provoking questions related to the nation's community development and quality of life. Participants also had opportunities to enhance their knowledge and skills in generative AI through specialised workshops and learned how to deploy their applications on cloud platforms.

JCU TropWATER STEM Waterways Citizen Science Project



The STEM Waterways Citizen Science Project is designed to enable school teams to learn to study aspects of waterways in depth, identify areas of scientific importance and interest, engage in good STEM practices. Students gain access to technologies and experts in order to create viable data and information that is a valuable contribution to local, and potentially global knowledge on these essential systems.



JCU TropWATER citizen science project



Engineering Without Borders Challenge 2023

In collaboration with partners including scientists from JCU TropWATER, Cairns Regional Council, Dawul Wuru Aboriginal Corporation and more, teams from high schools in the region gain full access of JCU TropWATER facilities to actualise their own STEM Waterways Citizen Science Project.

SDG 9 2023 Engineers Without Borders Challenge Showcase at JCU



JCU and TNQ Drought Hub hosted the Engineers Without Borders (EWB) Challenge Showcase at the Nguma-bada Cairns campus for first-year engineering students from Australia and New Zealand in December. JCU's Professor Allan Dale said more than 10,000 first-year university students compete to solve engineering challenges in the EWB Challenge each year identified by community-based partners. In 2023 the community-based partners are the Dawul Wuru Aboriginal Corporation and for the first time a 2nd country community-based partnership with Pu Ngaol Village in Monduliri province in Cambodia. Students were tasked with finding solutions that addresses issues such as agriculture, fresh water supply and storage and sanitation and hygiene. In Cairns the students were tasked with designing solutions to assist the Yirrganydi people with Caring for Country. This is the second time the showcase has been held in Cairns with last years the team with the most outstanding design project pitch during the Showcase going to Griffith University - Catching Kunyarra. The team designed a noise insulating motor cowl that aims to reduce noise and vibrations from crocodile monitoring boats, featuring an insulating layer made from sustainably sourced sugarcane bagasse.

Engineering Futures residential camp



Held at JCU's Bebegu Yumba campus Townsville, the inaugural Engineering Futures - Residential Camp gave 80 high school students, including 42 young women, from more than 50 schools across four different states and territories an experience of tertiary

education in science, engineering and technology-related fields – following a rigorous selection process. JCU Centre for Education and Enhancement Careers and Wellbeing Manager, Kate Sheppard, said the camp gave students the opportunity to let their minds flourish in an innovative and supportive environment.

The Year 10 to 12 students, who come from the Northern Territory, New South Wales, Victoria and Queensland, completed courses on mechanical design, physics and civil engineering, materials and chemical engineering, and career development before they presented their final project. The project involved student teams designing and building a model car that was put through a series of challenges to test its resilience against crash impacts at different speeds. The students enjoyed working hard across the week to grapple with critical engineering concepts and then demonstrated their mastery of those with a project at the end.



Engineering Futures - Residential Camp students Ananya Malik, from Gladstone State High and Jonty Heath-Coppin, from St Andrew's Catholic College, crash test a model car.

Cyclone Safety testing in the Pacific



Climate models have predicted that over the next few decades, tropical cyclones are likely to have greater intensity with stronger winds and higher rainfall. This is not only a threat to communities in northern Australia, but also people living throughout the Pacific. Born out of Cyclone Althea's and Cyclone Tracy's devastation during the 1970s, JCU's Cyclone Testing Station (CTS) has brought about significant improvements in building safety throughout Australia and the Pacific. CTS research has identified design and construction methods to ensure that buildings in northern Australia, Fiji, and Tonga have increased resistance to cyclones.

In Australia, the CTS found that garage and large exterior doors were often the most vulnerable part of a building and were linked to extensive building damage during cyclones. CTS engagement with industry stakeholders has improved standards for the design, installation, and testing of garage doors in both Australia and New Zealand. CTS also undertook regional projects in Fiji and Tonga to increase cyclone resilience among communities in the Pacific. Collaborating with the Fiji Institute of Engineers, CTS provided education workshops for builders and engineers that focused on wind-resistant building designs. Through this research, people and communities throughout the Asia-Pacific region are prepared, proactive, and informed about cyclone resilience.



JCU Cyclone testing station

Seagrass weeding to restore coral reef

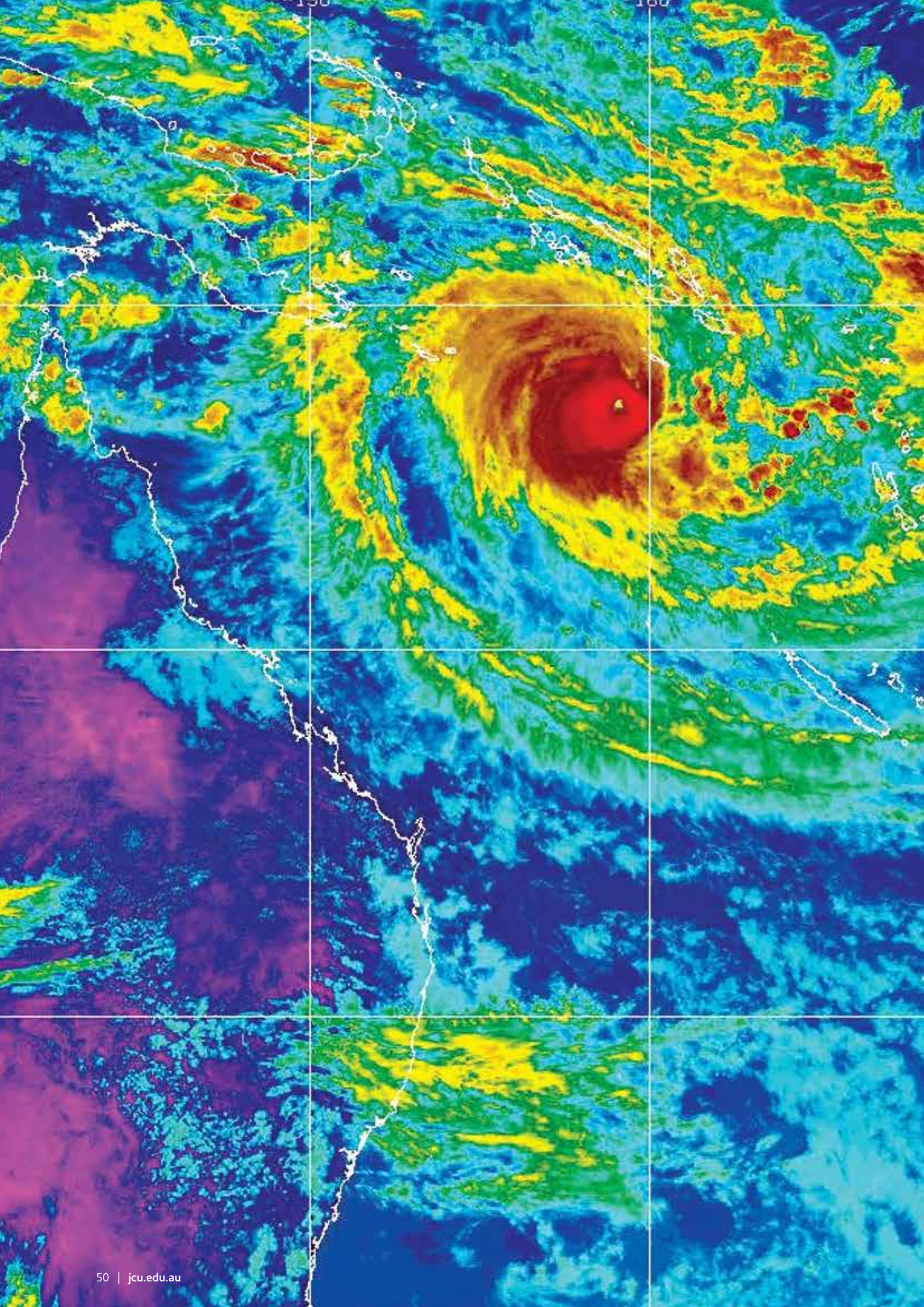


A volunteer seaweed removal program involving citizen scientists has seen a dramatic improvement of up to 600 per cent coral regrowth off the coast of Magnetic Island. Led by JCU Senior Research Officer Hillary Smith and Professor David Bourne (JCU and Australian Institute of Marine Science), the joint Earthwatch Institute program, which has been ongoing since 2018, saw volunteer citizen scientists help remove macroalgae (aka "sea-weeding") from experimental plots at two reef sites. The findings from the first three years of the project, published in the Journal of Applied Ecology, show that in

areas of reef that were weeded, significant regrowth was recorded, in a welcome sign for rejuvenation of corals. Over the same time period, no change in coral cover was recorded in plots where the team didn't remove the macroalgae. The collaborative partnership involves Earthwatch Australia and James Cook University and is funded by Mitsubishi Corporation as part of their Global Coral Reef Conservation Project. Ms Smith said while corals and seaweed are both natural parts of a reef, when there is widespread coral loss from extreme weather events, such as bleaching or cyclones, seaweed is much faster to regrow and outcompete coral. Many reefs around the world are seeing corals being replaced by macroalgae as climate change and local stressors devastate global reef ecosystems, placing increased focus on developing active management approaches. The removal method used by volunteers involved pulling the seaweed from the seafloor by hand.



Dr Adam Smith participating in the seagrass weeding project at Magnetic Island



6.0 SDG 13 Climate action

6.1 2023 State of the climate



The Australian Government’s Annual Climate Change Statement 2023 outlines the current global situation and outlook for 2023:

- The largest monthly anomaly in global averaged temperatures ever recorded was in September 2023 at more than 1.4°C above preindustrial temperatures.
- June, July, August and September all broke monthly temperature records.
- Roebourne Aero, in north-west Western Australia, had the warmest temperature recorded in Australia in 2023 at 49.5 °C on 31 December.

In Australia, significant climate change is being experienced:

- Australia’s climate has warmed on average by 1.48°C since national records began in 1910.
- Oceans around Australia are acidifying and have warmed by around 1°C since 1900, contributing to longer and more frequent marine heatwaves.
- There has been an increase in extreme fire weather, and in the length of the fire season, across large parts of the country since the 1950s, especially in southern Australia.
- Rainfall between April and October has declined across parts of southwestern Australia since the 1970s and southeastern Australia since the 1990s.
- According to the National Emergency Management Agency, 29 natural disasters were declared in Australia in 2023, with 20% of Australian local government areas impacted.

The Australian Bureau of Meteorology’s Annual Climate Statement 2023 states that globally, 2023 was the warmest year on record, with record warm oceans and record low Antarctic sea-ice extent. The 2023 Australian winter was the warmest on record, with a mean temperature 1.53°C above the 1961-1990 average.

2023 was the eight-warmest year on record in Australia and mean annual maximum and minimum temperatures in 2023 were above average for all states and territories. Heatwaves were experienced between October to December, and multiple major flood events occurred across inland and northern regions. Australia also experienced its driest 3-month period on record since 1900 from August to October 2023.

Australia’s future climate

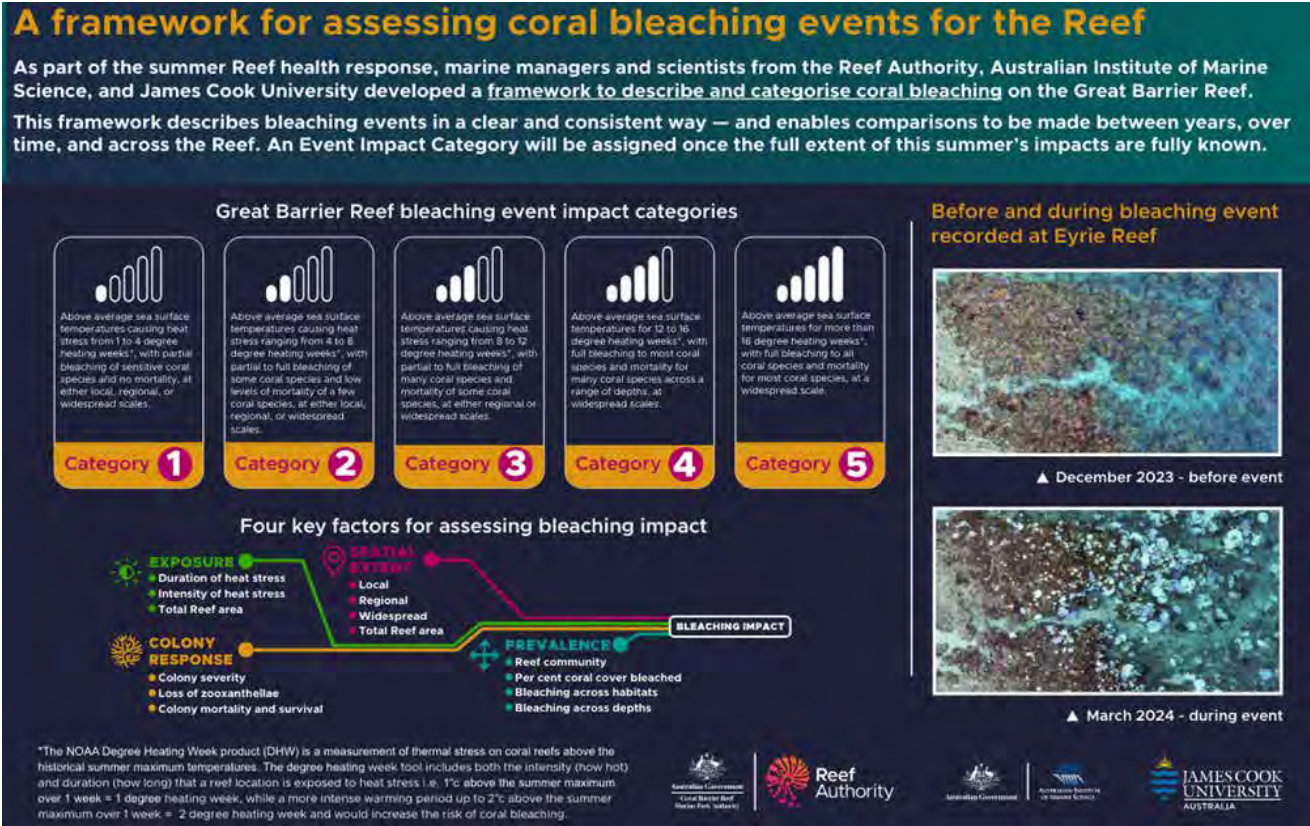
The Australian Government Bureau of Meteorology State of the Climate 2022 report states that Australia’s climate is projected to experience ongoing changes in the future including:

- Continued increase in air temperatures, more heat extremes and fewer cold extremes.
- Continued decrease, on average, in cool season rainfall across many regions of southern and eastern Australia, which will likely lead to more time in drought, but with ongoing climate variability that will give rise to short-duration heavy-rainfall events at a range of timescales.
- Further sea level rise and continued warming and acidification of the oceans around Australia.
- Increased and longer-lasting marine heatwaves that will affect marine environments, such as kelp forests, and increase the likelihood of more frequent and severe bleaching events in coral reefs around Australia, including the Great Barrier Reef and Ningaloo Reef.
- Fewer tropical cyclones, but a greater proportion is projected to be of high intensity, with large variations from year to year.



Flooding in the Baron River, Cairns after Tropical Cyclone Jasper December 2023

Figure 6.2.2: Framework for assessing coral bleaching on the GBR - partnership between Australian Government, AIMS, JCU – from the *GBRMPA Reef Snapshot 2023-2024*



6.4 SDG 13 Climate change research at JCU

Heatwaves causing an increase in deaths in Queensland

3 GOOD HEALTH AND WELL-BEING

13 CLIMATE ACTION

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

JCU researchers examining heatwave deaths across Queensland are calling for government action to lower the toll as global climate change sees temperatures rise. Miss Hannah Mason and Professor Richard Franklin from the College of Public Health, Medical and Veterinary Sciences examined the effects of heatwaves on mortality in Queensland between 2010 and 2019. Miss Mason said heatwaves contribute to more deaths in Australia than any other environmental disaster and little was known about the impacts of heatwaves on mortality outside of Brisbane. They also found that overall, the total risk of mortality was 5% greater in Queensland during heatwaves between July 2010 and January 2019. The researchers found that the number of heatwave days per annum in Queensland is increasing, from 9504 cumulative days in 2010/11 to 31,236 days in 2018/19, and that heat-health impacts are considered largely preventable. The study called for more research in partnership with local authorities to ensure effective solutions for population sub-groups, those with co-morbidities and to address other factors at play such as air quality and humidity.

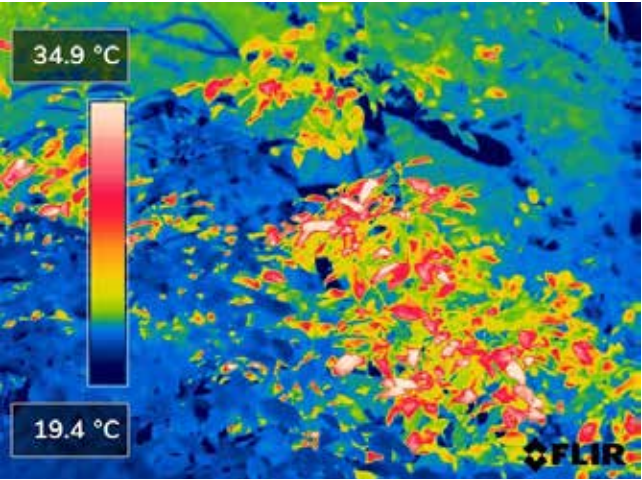
Climate change risk to mangrove health

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

JCU TropWATER scientist Norman Duke published research in collaboration with the Bureau of Meteorology, Charles Darwin University and the University of Melbourne, examining the impact of climate variability on mangrove dieback in northern Australia. The researchers have been studying one of the worst recorded mangrove dieback events that occurred during the El Niño of 2015 following an extreme, two-year sea level drop, illustrating that enhanced climate variability



Infra-red image showing the temperature gradients of leaves in the experiment. Image: Kali Middleby.

can exacerbate major stressors for these ecosystems. The study found that climate projections from the sixth generation of Coupled Model Intercomparison Project indicate an increased occurrence of anomalously low and high sea level events in the coming century. This, alongside enhanced temperature stress, is likely to significantly increase risk to mangrove health in this region.

Critical temperature threshold for tropical forests

13 CLIMATE ACTION

15 LIFE ON LAND

A study between the JCU Centre for Tropical Environment and Sustainability Science and the Northern Arizona University examined the effect of increasing temperature on death of leaves of tropical tree species. The study found that leaves increased in temperature in a non-linear pattern with increasing temperature, and more than 1% of the leaves in the canopy warming experiments exceeded critical temperature thresholds, beyond which the leaves can no longer function. The researchers predicted tropical forests could potentially withstand up to 3.9°C of climate change-driven warming.

Aboriginal and Torres Strait Islander International Engagement Organisation (ATSIIEO)

10 REDUCED INEQUALITIES

13 CLIMATE ACTION

The Aboriginal and Torres Strait Islander International Engagement Organisation (ATSIIEO) has successfully begun its foray into the international sphere in advocacy of Indigenous responses to climate change and global sustainability. From the ATSIIEO National Council Jack Collard was in attendance at COP27 at Sharm El Sheikh in Egypt to address the international community.

Providing a First Nations perspective on the current global trajectory as well as our current action on climate change and environmental sustainability. The input of Indigenous peoples within International frameworks has never been more critical as their knowledge, governance systems and methods are what is required to ensure a sustainable and balanced future on earth. ATSIIEO is supported by the JCU The Cairns Institute, in partnership with The Streets Movement.





operating conditions required for superior quality biochar, higher bio-oil generation, and the potential for carbon dioxide sequestration. Biochar has also been identified as a viable source for low-carbon building materials.

The research findings contribute to the exploration of sustainable solutions for biomass conversion and underscore the importance of utilizing various wastes, including food waste, for energy production while mitigating environmental impacts. Based on these findings, custom-made microwave-assisted pyrolysis technology has been scaled up to process 1 ton of waste per day, and a deployable waste energy system has been developed, particularly for Defence applications.



Clean and affordable energy

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Dr Breda McCarthy, a JCU researcher with the JCU Centre for International Trade and Business in Asia (CITBA), has delivered a report to Energy Consumers Australia regarding Renewable Energy Adoption in Queensland. The report investigates electricity-saving practices in households by either investing in renewable energy, such as rooftop solar or changing consumer behaviour by voluntary curtailment of electricity use. The report provides specific recommendations for policy makers and energy retailers resulting from the research.



Sustainable consumption and lifestyles

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

GO

JCU researcher, Dr Breda McCarthy found that even people who identify as being “sustainable consumers” waste more than 10% of their food. By grouping the respondents to a survey, they were able to identify lifestyle predictors for the level of food waste by each group. A total of six lifestyle segments are identified: the freshness lovers, the vegetarian and organic food lovers, the recycle/reuse advocates, the waste-conscious consumers, the label-conscious/sensory consumer and the food waste defenders.

This research distinguishes between low and medium levels of food waste based on marginal effects analysis. At low levels of food waste, consumers who worry about the food waste cost, making efforts to reduce food waste are less likely to waste food. Affluent consumers, who claim to be waste conscious, have young children, and frequently eat outside, are more likely to waste food than others, lying in the medium waste group. This could lead to changes in messaging to socio-economic groups around food waste and how to reduce it.



Dr Breda McCarthy

Minerals for green energy technology

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Geoscience lecturer and WOMEEESA President Dr Melanie Finch received an Australian Institute of Policy and Science Queensland Young Tall Poppy Science Award in 2023 in recognition of her research investigating how minerals needed for green energy technology are concentrated in rocks, helping explorers find new mineral deposits.

Green energy technology such as wind turbines, solar panels and electric car batteries are made up of a range of metals, such as copper, cobalt, and rare earth elements. These are referred to as ‘critical metals’ due to their importance in the global switch to green energy technology. The switch to green energy technologies will be quicker and cheaper if more critical metal deposits are found within Australian rocks.

WOMEEESA, Women in Earth and Environmental Sciences in Australasia, is committed to creating a unified Australasian network of women working in Earth and Environmental Sciences in academia, industry, and government.



Dr Melanie Finch

Octopus DNA contains grave warning for sea level rise

13 CLIMATE ACTION

14 LIFE BELOW WATER

JCU scientists Professor Jan Strugnell and Dr Sally Lau have used octopus DNA to discover that the West Antarctic Ice Sheet (WAIS) likely collapsed during the Last Interglacial period around 120,000 years ago – when global temperatures were similar to today. This provides the first empirical evidence that the tipping point of this ice sheet could be reached even under the Paris Agreement targets of limiting warming to 1.5oC – 2oC.

Using a panel of genome-wide, single-nucleotide polymorphisms of a circum-Antarctic octopus, the team showed persistent, historic signals of gene flow only possible with complete WAIS collapse. The team’s research solves a long-running mystery that has puzzled scientists about whether the WAIS collapsed during the Last Interglacial and helps improve future global sea level rise projections.

Climate change affecting groundwater quality in Tonga

6 CLEAN WATER AND SANITATION

13 CLIMATE ACTION

A JCU study by researchers Ashneel Sharan and Dr Bithin Datta into why controlling water abstraction and acting against climate change is essential to preserve the availability and quality of groundwater, will be helpful for managers, stakeholders, and policymakers in Tonga and the broad scientific community, in managing saltwater intrusions and preserving water resources. Small low-lying Pacific Island countries are prone to climate change and water resources-related issues.

The demand for water in Pacific Island countries has increased significantly due to population growth, industrialisation, tourism, and agricultural needs. Groundwater is utilised by most of the Pacific Island countries, and due to increasing demand, the majority of the Pacific Island countries practise over-abstraction, where the amount of water taken is greater than the amount falling as rain.

Climate change caused by natural means and over-abstraction of groundwater has led to saltwater intrusion into the coastal aquifers and other groundwater-related problems in several low-lying Pacific Island countries. Analysing salinity data from wells, rainfall patterns, sea-level height and carbon dioxide emissions over time indicated that over-abstraction has caused saltwater intrusion and affected groundwater quality.

Biomass conversion for lean energy production

2 ZERO HUNGER

7 AFFORDABLE AND CLEAN ENERGY

A significant amount of biomass waste, including agricultural and food waste, is disposed of in landfills, negatively impacting the environment. Similarly, other types of waste such as tyres and various forms of plastics, including PPE materials, are also sent to landfills. Microwave Assisted Pyrolysis technology has been developed to convert all types of non-metallic waste into by products such as biogas, bio-oil, and biochar.

Several studies have reported on the conversion of different feedstocks, particularly sugar bagasse, plastics, medical waste, tyres, and food waste such as pumpkin peel and pineapple, for resource and energy recovery through microwave pyrolysis under different operating conditions. These studies have determined the optimal



7.0 SDG 8 Economic Sustainability

JCU Indigenous Workforce Strategy Action Plan 2021-2025

8

DECENT WORK AND ECONOMIC GROWTH

10

REDUCED INEQUALITIES

JCU has updated the Indigenous Workforce Strategy Action Plan (IWSAP) with revised activity end dates, the status of deliverable activities and revised targets in 2023. The Strategy draws on best practice from across the higher education sector and gives a sense of purpose to our ambition of a culturally diverse and welcoming environment for all staff.

The Strategy has been developed in consultation with a range of partners – most especially our Aboriginal and Torres Strait Islander colleagues. The plan outlines objectives and goals under the domains of Opportunity, Creating an environment that is respectful of Indigenous culture, Community, and Oversight and Governance.

JCU aims to have a strong workforce of Aboriginal and Torres Strait Islander people at all levels of our organisation. JCU will provide career growth opportunities, competitive pay and benefits, and a safe work environment for all Aboriginal and Torres Strait Islander employees.

JCU Enterprise Agreement 2022

8

DECENT WORK AND ECONOMIC GROWTH

The JCU Enterprise Agreement 2022 was approved by Commissioner Spencer of the Australian Fair Work Commission on the 31st of July 2023, and became active on the 7th of August 2023. Under the JCU Enterprise Agreement 2022 JCU staff members received a wage increase of 5.5% on the first of July 2023.

Continuing and fixed-term staff members continued to progress through the incremental structure as due, and allowances due to staff were also indexed in accordance with the salary increases.

Figure 7.1: Economic Sustainability and Governance – JCU at a glance



7.1 SDG 12 Sustainable consumption, procurement, and circular economy

Sustainable Procurement at JCU



The JCU Strategic Procurement team have published the JCU Corporate Procurement Plan that details JCU’s approach to procurement principles that address growing concerns about the environment, sustainability, and corporate social responsibility by incorporating more environmentally and ethically responsible procurement practices. JCU provides staff and students with financial delegation a list of Preferred, Indigenous and Social suppliers that have been assessed for sustainable, social procurement credentials and adherence to the JCU Social Procurement Guidelines and the JCU Modern Slavery Statement. JCU staff are made aware that utilising a supplier that is not included in these lists has the potential to breach JCU’s commitments to social and sustainable procurement, especially for goods sourced and imported through international suppliers.

The University, as a Queensland Government ‘Statutory Body’ is required to comply with policy and standards including the Queensland Procurement Policy. Compliance with these policies & standards may be subject to audit by the Queensland Audit Office. JCU examined the sustainability credentials of 100 of the most frequently used suppliers through the Givvable online sustainable procurement platform. The university’s suppliers were found to be mostly aligned with SDG 8, Decent work and economic growth, SDG 16, Peace justice and strong institutions and SDG 10 Reduced inequalities.

In analysing the sustainability credentials of the most frequently used suppliers at JCU, it was found that 64% of these businesses were matched to a sustainability credential, mostly global credentials, with

over 773 different sustainability credentials recorded. Supplier matches have increased 10%, and there has been a 29% increase in unique credentials since 2022.

JCU analyses the responsible procurement practices of its suppliers and has a detailed procedure for suppliers of tenders with evaluation criteria. The responsible procurement process identifies if the supplier is a local, Queensland or Australian business, or a social enterprise. The process requests details of any environmental sustainability initiatives the business has enforced, and if the business is accredited to ISO14001 (Environmental Management Systems). JCU procurement mandatory criteria for suppliers of tenders include compliance with the Qld Government’s Modern Slavery requirements, and compliance with the Qld Government’s Ethical Supplier Threshold. Part of the process identifies First Nation Indigenous suppliers and records the annual JCU spend with Indigenous suppliers and social enterprises. JCU has steadily increased its spend with Indigenous suppliers since 2019, and in 2023 \$1.2 million was spent with Indigenous suppliers.

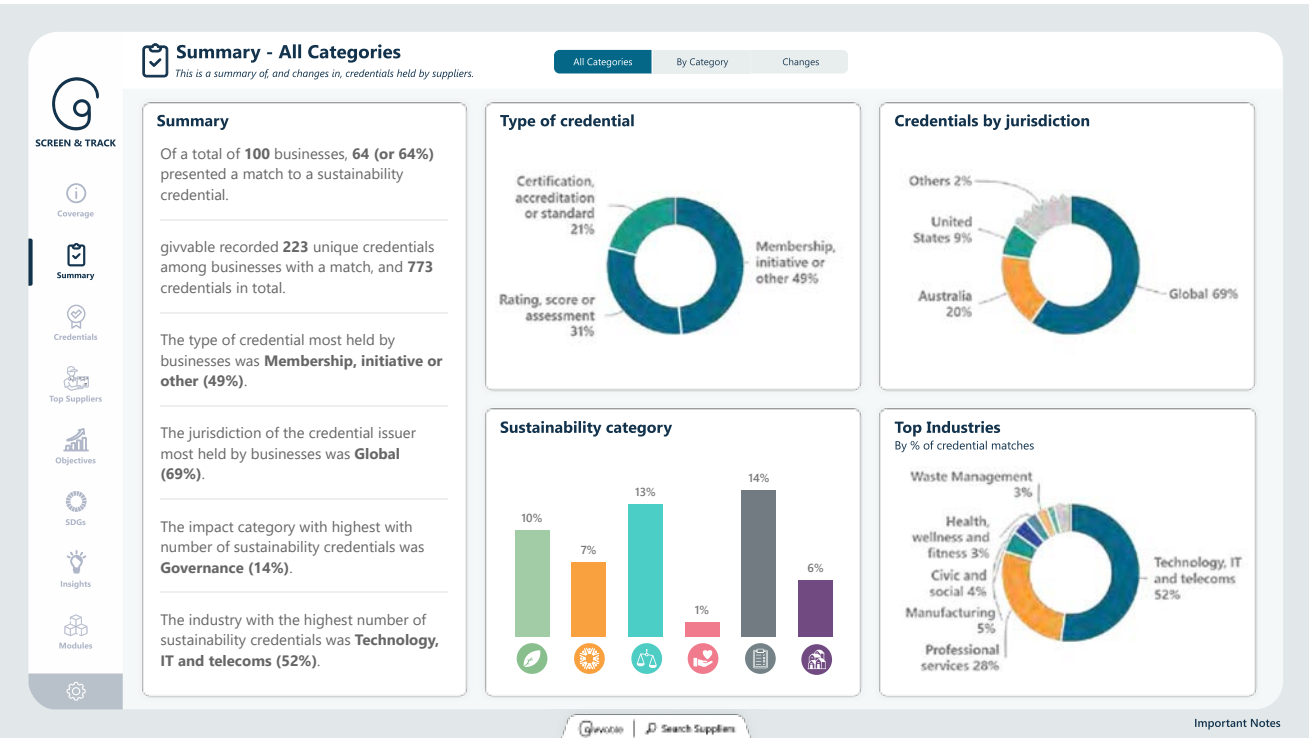
Queensland Indigenous Business Network



Queensland Indigenous Business Network (QIBN) was officially launched as part of Indigenous Business Month 2023 on the 12th of October at the Speakers’ Hall, Parliament House in Brisbane.

QIBN is a first-of-its-kind network in Queensland, led by Aboriginal and Torres Strait Islander business leaders to help First Nations owned businesses grow and thrive. TNQ Drought Hub Sustainable Aboriginal and Torres Strait Islander Enterprise (SATSIE) program has been an early supporter in the establishment of QIBN. The SATSIE program sponsored 5 Indigenous business owners, entrepreneurs and leaders from Cape York, Cairns, the Torres Strait and Alice Springs to attend the July Developing Northern Australia (DNA) Conference in Darwin as part of an Indigenous Business Scholarship package. Fraser Nai, one of the recipients who also stepped into being a panel

Figure 7.12 Sustainable procurement analysis supplier sustainability credentials from the Givvable platform.



member for the Enabling Infrastructure for Northern Australia workshop, said if we are to consolidate our place in the world, then being relevant in the things that are shaping our place in this world is of upmost importance. Visionary courageous leadership is what this moment is calling for.’ The TNQ Hub is led by JCU and based out of the JCU Ideas Lab. Working in a ‘hub and spoke’ model, the TNQ Hub is partnered closely with six natural resource management (NRM) groups across tropical north Queensland to deliver drought resilience activities across the region.



Indigenous Small Business Month



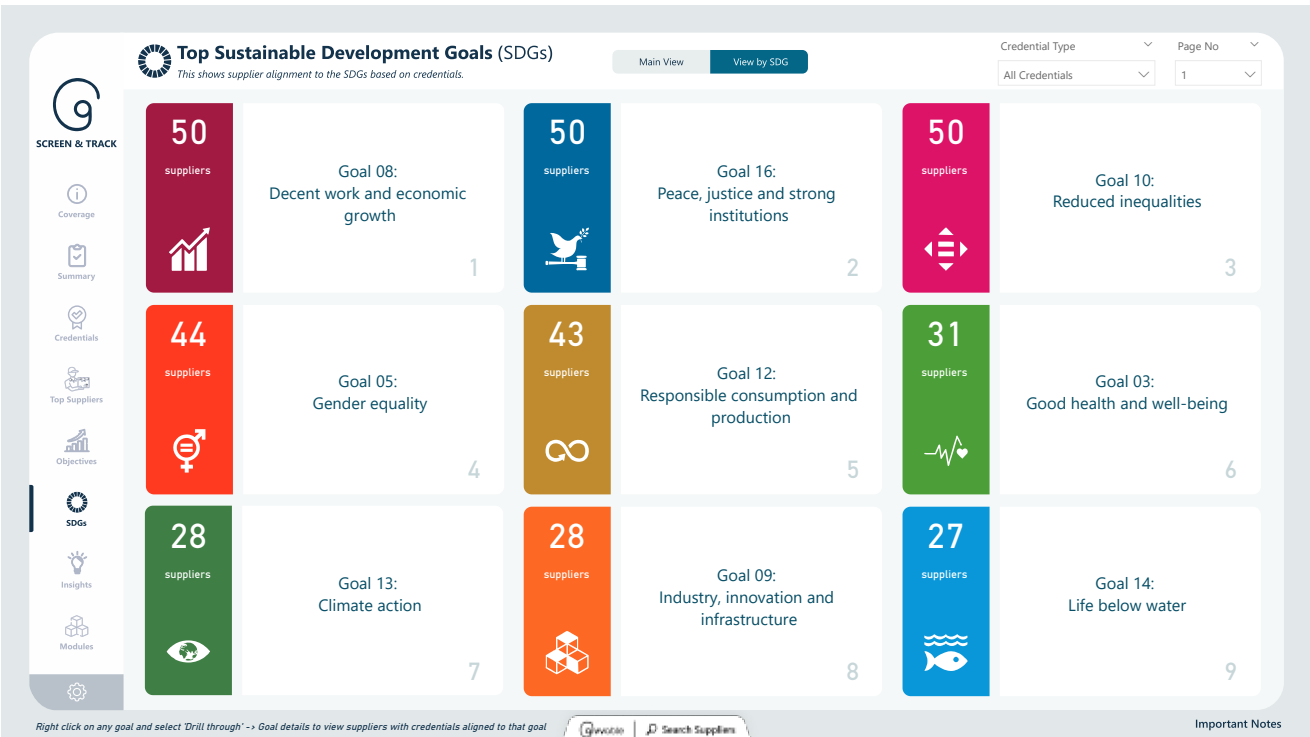
The Department of Youth Justice, Employment, Small Business and Training (DYJESBT), in conjunction with the Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) held a corporate event to celebrate Indigenous Small Business Month on 10 October in Bamaga. Bamaga is located 40km from the tip of Cape York. It is one of five communities that collectively form the Northern Peninsula Area (NPA) at the tip of Cape York. Injinoo, Umagico (Alau), New Mapoon and Seisia communities make up the remainder of the NPA. Indigenous Business Month is a nation-wide campaign held 1 - 31 October each year; 2023 is its 9th year. The theme of this year’s Indigenous Business Month is ‘To Gather, Together’ which calls upon First Nations businesses to gather, share and celebrate the power of Aboriginal and Torres Strait Islander people’s economic, social and cultural contribution.

It shines a light on the growing number of successful Aboriginal and Torres Strait Islander owned businesses delivering high-quality, value for money products and services across all sectors in Queensland. The TNQ Drought Hub JCU Cairns campus, Sustainable Aboriginal and Torres Strait Islander Enterprise (SATSIE) program understands that partnering with Aboriginal and Torres Strait Islander owned businesses unlocks economic opportunities to build stronger, more resilient businesses and communities while also delivering value for money everyday goods and services.



Indigenous Small Business Month recipients

Figure 7.11 JCU Sustainable procurement analysis -suppliers alignment with the SDGs from the Givvable platform





JCU CITBA SEIGOP conference Singapore 2023

JCU Centre for International Trade and Business in Asia (CITBA)



JCU CITBA provides a platform for researchers, academics, practitioners and students to disseminate their findings and engage with other global experts in the field of international trade and business. One of the key ways CITBA achieves this is through the organization of workshops, international conferences, and other events. In 2023 CITBA held major international conferences to chart a course for significant positive changes within the tropical region.

- ITBA Regional Economist Annual Meeting (REAM) - The meeting was a robust platform for comprehensive discussions, fostering deep thinking and analysis of the evolving economic landscape. Delegates engaged in insightful dialogues, leveraging their diverse expertise to delve into the intricacies of regional economic trends, challenges, and opportunities. Delegates, comprising esteemed members from academia, government, and independent sectors, convened in a collaborative spirit that surpassed traditional networking boundaries.
- JCU Sustainability, Economics, Innovation, Globalisation and Organisational Psychology (SEIGOP) 2023 – hosted by JCU Singapore, the proceedings of the SEIGOP 2023 conference (SEIGOP 2023) is now published under the title of "Innovation-Driven Business and Sustainability in the Tropics". The conference included 55 national and international participants from Japan, Kenya, New Zealand, Nigeria, South Korea and a keynote speech by Associate Prof Jonathan Reynolds, University of Oxford.

JCU Sustainability Research Cluster – Best Paper award



Researchers at the JCU Sustainability Research Cluster at JCU Singapore investigating circular economy have been awarded "Best Paper" at 83rd Academy of Management Meeting in Boston for their paper "Circular Economy and Consumer Acceptance on Product-Service System: A Customer-Dominant Logic View". The researchers were led by Associate Professor Adrian Kuah and included, K. Thirumaran, Pengji Wang, and Mr Chang Hee Kim. The 83rd AOM Annual Meeting is the largest gathering of management and organisation scholars annually in North America to expand research and disseminate the latest knowledge on management.

The annual meeting draws attention from over 10,000 attendees around the world, and about 1,500 papers are selected for presentation. The Sustainability Research Cluster began as a circular economy and sustainability group arising out of Round Two of the Strategic Research Investment Fund Application — a research grant call by James Cook University Australia with industry support to co-invest in worthy research groups — in 2018. The work carried out by the group across Singapore and in Australia is unique, because it covers the circular economy, green consumers, and the social economy, that successfully weave social science and environmental sciences into evaluations of real business models.

7.2 SDG 8 JCU Sustainable Investment

JCU Sustainable investments – Mercer Review 2023



JCU's Investment Policy and Procedures (FPM 300 & 301) sets out the University's overall responsible investment (RI) beliefs, commitments, and approach for addressing environmental, social and governance (ESG) factors and sustainable investing. JCU has commissioned Mercer as a Fund Manager to oversee the ESG sustainability factors of the JCU investment portfolio meet the University's commitment to Sustainable Investments. The Mercer Annual ESG Review for JCU's investment portfolio found JCU performed well across all key ESG metrics monitored.

The review found ESG considerations are reasonably well integrated into the investment process of the underlying funds JCU are invested in, as evidenced by its portfolio ESG rating better than the universe figure by 22%. There were no exclusions across tobacco or controversial weapons, or modern slavery breaches identified in the JCU portfolio and JCU complies with all commitments within its RI Policy.

Emissions tracking progress towards net zero

Mercer tracks emissions progress on both a weighted average carbon intensity (WACI) and carbon footprint basis (absolute emissions per million dollar invested). Mercer has set a net zero by 2050 emissions target across its portfolio, with an expectation to reduce portfolio emissions by 45% by 2030. The overall JCU portfolio has a greenhouse gas emissions intensity 31% below the composite benchmark, with all underlying funds being less emissions intensive than their respective benchmarks.

Mercer recommends that JCU consider further areas for improvement including guidance from the Task Force on Nature-related Financial Disclosures (TNFD), increase transparency and reporting to stakeholders, and to set staggered emissions reduction targets in the portfolio.

Figure 7.21 JCU ESG Rating for 2023 in the Mercer annual review, showing stronger ESG integration compared to the universe figure

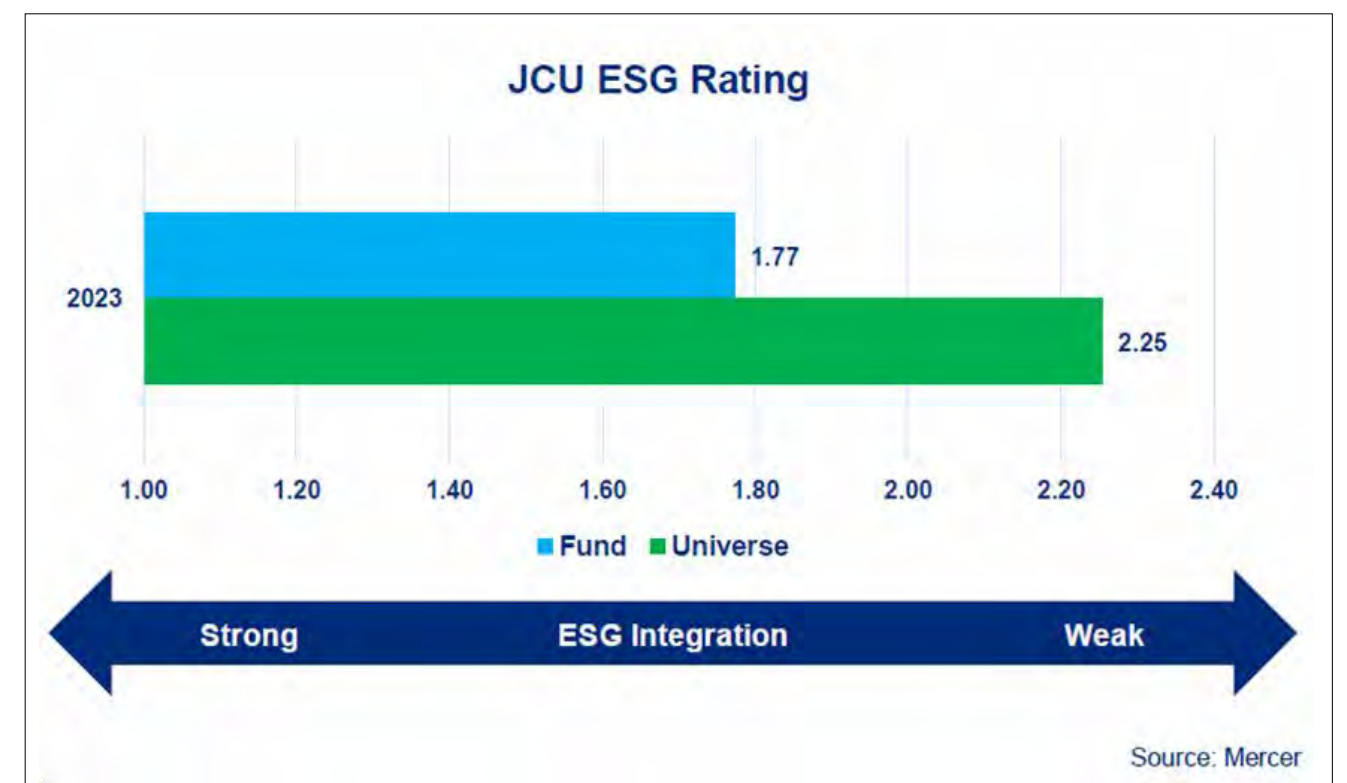
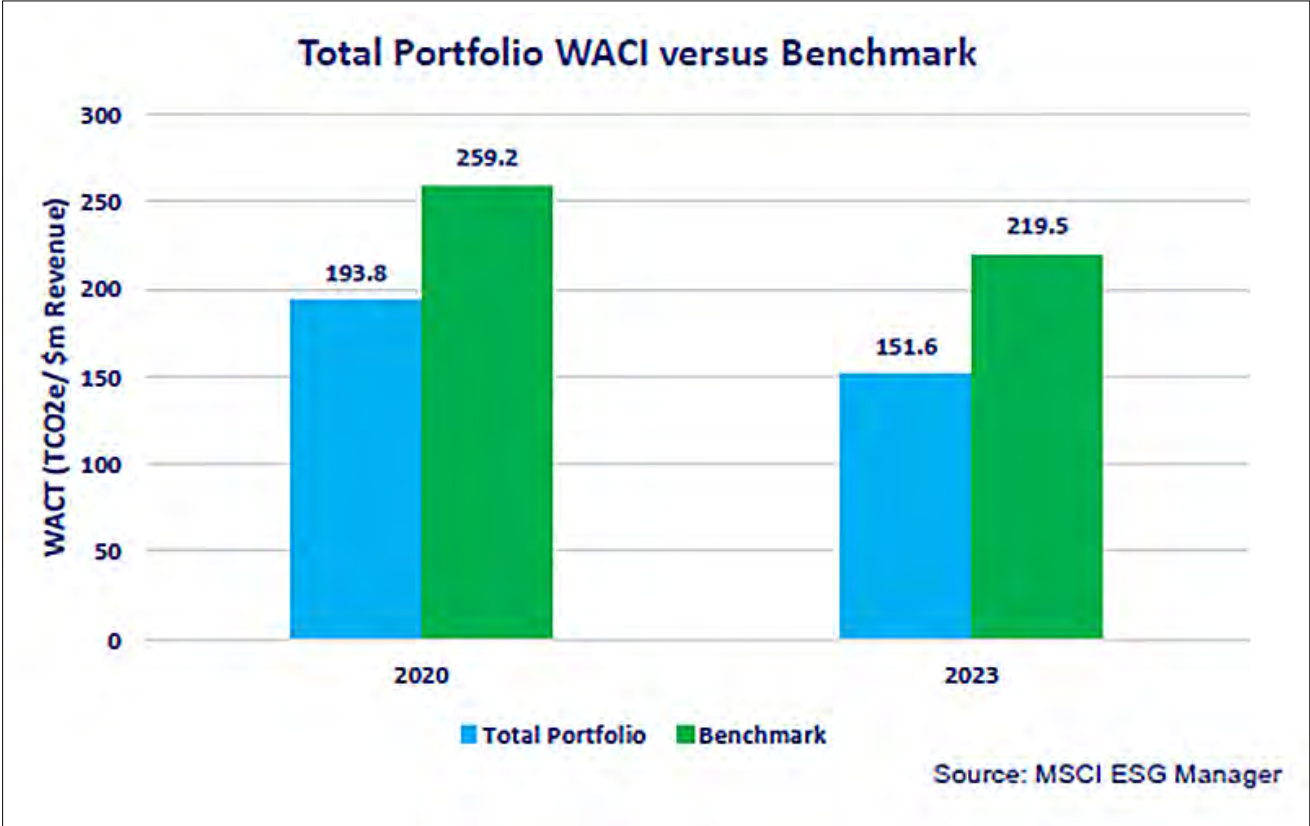


Figure 7.22 JCU’s Investment portfolio weighted average carbon intensity (WACI) compared with the benchmark, in 2020 and 2023.



Social and Environmental impact of JCU’s portfolio investments



JCU’s listed portfolio is more strongly aligned to the SDGs than its aggregate benchmark, with a portfolio net impact score of 1.46 (vs. 0.86 for the benchmark, or 70% higher alignment). The portfolio is positively contributing to the majority of the social objectives. Notably, its contribution is exceeding the benchmark in SDG 3 Good Health & Wellbeing. The portfolio’s net impact is more muted across environmental objectives (note the scale shows 0.8 to +0.6, where the total scale of ratings is -10 to +10).

However, it is overall, more strongly aligned to the environmental goals relative to the aggregate benchmark, particularly in SDG 7 Affordable & Clean Energy, SDG 13 Climate Action, and SDG 12 Responsible Consumption & Production.

ISS measures both the ‘Positive’ (Contributing) and ‘Negative’ (Obstructing) impacts of a company based on net sales generated from products or services that contribute or obstruct the achievement of the thematic objectives. ISS score companies on a scale of -10 (where 100% of revenue are derived from business activities which have an ‘Obstructing’ impact on the SDGs) to +10 (where 100% of revenue are derived from business activities which have a ‘Contributing’ impact).

Figure 7.23 JCU Investment Portfolio impact of the UN SDGs





8.0 SDG 16 Policy and Governance

JCU IS RANKED
#27
IN THE WORLD FOR SUSTAINABLE GOVERNANCE,
BY THE 2024 QS SUSTAINABILITY RANKINGS

Australian Universities Accord

4 QUALITY EDUCATION10 REDUCED INEQUALITIES16 PEACE AND JUSTICE STRONG INSTITUTIONS17 PARTNERSHIPS FOR THE GOALS

In 2023, the higher education sector engaged in a series of consultations with the Australian and Queensland Governments about the future of the tertiary sector through the Australian Universities Accord. JCU engaged in the schools focused Review to Inform a Better and Fairer Education System to lift educational attainment rates across individual lifetimes in place-based ways in the north. The engagement of the Queensland Government through ministerial meetings with the Queensland Vice Chancellors Committee (QVCC) and Higher Education Forums, remain important ways to ensure that actions related to the Queensland Government priorities of Good Jobs, Better Services and Great Lifestyle are achieved in partnership with Queensland’s universities.

JCU values further State and Commonwealth policy alignment across the tertiary education sector between VET and higher education in delivering workforce development as a regional priority, leveraging mechanisms like the Regional Jobs Committees and partnerships with economic and regional development bodies and Local Governments. JCU remains committed to working in partnership with the Australian and Queensland Governments, as well as local governments in 2024, as Accord reforms are delivered and adopted by the sector.

JCU working with the Queensland Government towards a sustainable medical workforce

3 GOOD HEALTH AND WELL-BEING16 PEACE AND JUSTICE STRONG INSTITUTIONS17 PARTNERSHIPS FOR THE GOALS

Additional Commonwealth Funded Medical Places for Queensland – In January 2023 Professor Richard Murray and the Vice Chancellor Professor Simon Biggs participated in a meeting with Queensland Health and other Queensland universities to discuss a proposed joint submission to increase the number of Commonwealth Supported places for medical students in Queensland and change the current undergraduate medical student placement model to build a more sustainable medical workforce.

In March JCU launched the commencement of the full Bachelor of Medicine, Bachelor of Surgery program on the Nguma-bada campus, Cairns. The Vice Chancellor welcomed dignitaries and attendees, and introduced the Hon Emma McBride MP, Federal Assistant Minister for Rural and Regional Health, who performed the official launch. This is a significant

boost for the Cairns region and state and local government officials joined in celebrating this milestone for JCU and the region including:

- The Federal member for Leichhardt, the Hon Warren Entsch MP;
- The Mayor of Cairns Regional Council (CRC), Mr Bob Manning OAM;
- The CEO of CRC, Ms Mica Martin;
- The National President of the Pharmacy Guild of Australia and JCU Outstanding Alumnus, Professor Trent Twomey;
- The Chief Medical Officer, Queensland Health, Professor Keith McNeil;
- The Acting Director of Medical and Emergency Services for the Cairns and Hinterland Hospital and Health Service, Dr Lachlan Gordon;
- The Executive Chair of Advance Cairns, Mr Nick Trompf.

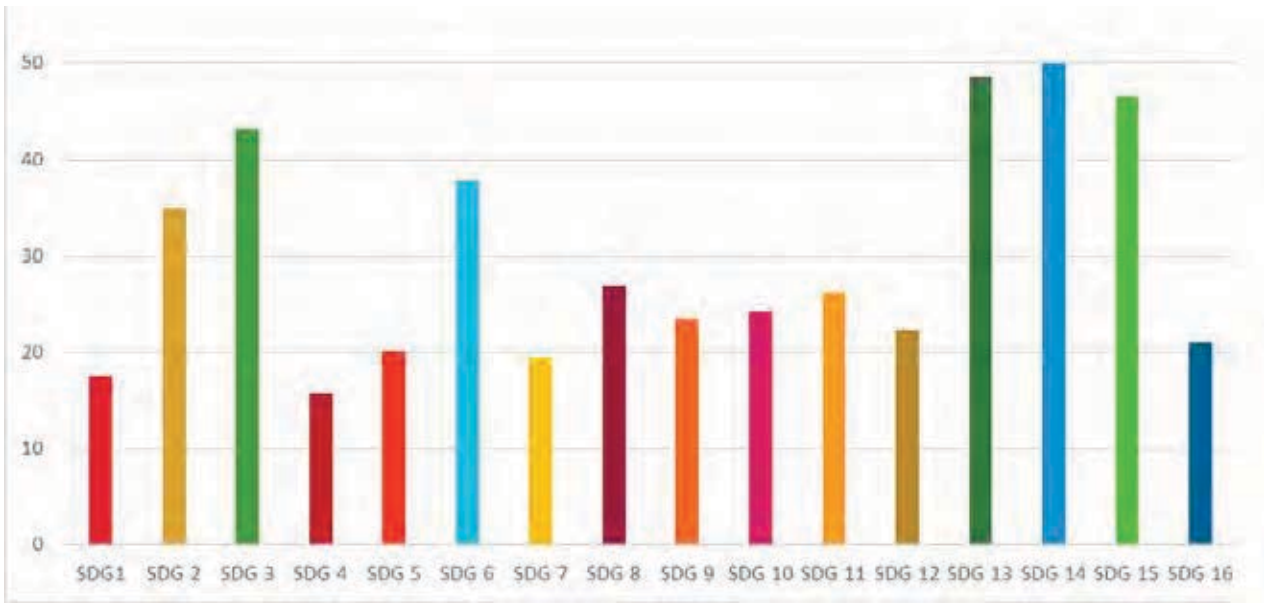


Australian Public Service Academy opens at JCU

8 DECENT WORK AND ECONOMIC GROWTH16 PEACE AND JUSTICE STRONG INSTITUTIONS17 PARTNERSHIPS FOR THE GOALS

A new Australian Public Service (APS) Academy Campus based in Townsville was officially launched by the Australian Government in October 2023. The Academy offers JCU students data and digital training and entry-level employment with the APS, aiming to provide employment for undergraduates and graduates, where students can earn as they learn. JCU Vice Chancellor Professor Simon Biggs said the Academy, based at JCU’s Bebegu Yumba Campus in Douglas, is an ideal steppingstone for students looking to work for the APS. Professor Biggs expressed gratitude to the APS and the Australian Government for realising the advantages of building up a local workforce by basing one of their Academy campuses here at JCU. The Vice Chancellor said the Academy creates jobs in the region and strengthens the local knowledge and experience base of the APS, which will benefit future policymaking in the region. The Townsville Campus at JCU is delivered under an initiative announced by the Australian Government last year, which will support data and digital employment pathways in regional locations for undergraduates, graduates, and career changers.

Figure 8.1 JCU research towards the SDGs – percentage of total scholarly output involving collaboration with governments 2019-2023.



Cairns Regional Council Briefing – strengthening local partnerships

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

On the 14th of August, the Vice Chancellor, Professor Simon Biggs provided a presentation to the Cairns Regional Council Briefing Session and Workshop. The workshops are designed to brief Councillors on progress and projects relevant to Cairns. The VC presented an update on the University and the market changes in higher education and for JCU specifically, as well as highlighting the investment JCU has made over the last decade. The VC briefed councillors on the Cairns Tropical Enterprise Centre (CTEC) and the Dugurrdja Precinct including the future of health education in Cairns and gave an overview of the Australian Universities Accord process. Councillors were very receptive to learning more about higher education in general and also JCU’s impact and contributions to the region.

Queensland Plan Ambassadors Council Meeting

8 DECENT WORK AND ECONOMIC GROWTH

16 PEACE AND JUSTICE STRONG INSTITUTIONS

JCU’s The Cairns Institute hosted the Queensland Government Queensland Plan Ambassadors (QPA) for an Ambassadors Council Meeting in Cairns on the October 10th, 2023. The Cairns Institute’s Professor Allan Dale was appointed as the Deputy Chair of the Queensland Premier’s Queensland Plan Ambassadors Council by Premier Palaszczuk earlier this year.

The Deputy Chair works closely with the Chairperson of the Council, the Honourable Tony McGrady AM, to coordinate ambassador activities and events. The Council meets regularly in various locations. Allan Dale said that “The Queensland Plan is a legislated document that sets out a long-term vision for the future of the state, working across shorter term electoral cycles. The Ambassador’s Council keeps a strong link between the Government of the day and the Queensland community about progress towards the implementation of the plan.”

The Plan is based on the belief that every Queenslanders should have a say in the future of the state. The Plan’s long-term community-based vision emerged from the largest statewide community engagement activity of

its kind ever undertaken in Queensland, with more than 80,000 people contributing to the process. The results within the Plan have articulated community aspirations for the next 30 years, setting a roadmap for growth and prosperity. While in Cairns, the Ambassadors met with The Cairns Institute Director, Distinguished Professor Stewart Lockie and many other regional stakeholders, community leaders and Traditional Owner groups.

JCU Academic – Government Collaboration 2019 to 2023

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

JCU Academy staff collaborate with all levels of government to produce world-class research that influences government policy and helps shape the future of Australia. Figure 8.1 shows the JCU research output from 2019 to 2023 showing the percentage of research papers aligned with each Sustainable Development Goal that involved collaborations between JCU academic staff and governments. There is greatest collaboration in environmental SDGs 13 Climate Action, 14 Life below water and 15 Life on Land, demonstrating the impact that JCU research has on the governance of environmental sustainability and climate change action for our region.

8.1 SDG 16 Action for Peace, Justice and Strong Institutions

North Queensland Law Association (NQLA) Conference

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

JCU College of Business Law and Governance were proud sponsors of the 2023 NQLA Conference. The tropical city of Cairns played host to the prestigious North Queensland Law Association (NQLA) Conference from the 18th to the 20th of May 2023. The event marked a significant gathering of legal practitioners from the region and is a highly anticipated event within the legal community of North Queensland. It is organised

annually and rotates between Mackay, Townsville, and Cairns, providing an opportunity for legal professionals to come together and exchange insights, knowledge, and experiences. The 2023 conference was held in Cairns, offering attendees not only a platform for professional development but also a chance to bask in the natural beauty of the region. Throughout the three-day event, attendees were treated to a diverse range of presentations and discussions on pertinent legal topics. These sessions were conducted by renowned experts in various fields of law, providing attendees with valuable insights into the latest developments and best practices. The conference program aimed to foster professional growth, ensuring that attendees left with a deeper understanding of the legal landscape.

2023 JCU Legal Studies Conference

4 QUALITY EDUCATION

10 REDUCED INEQUALITIES

16 PEACE AND JUSTICE STRONG INSTITUTIONS

In 2023, JCU welcomed collectively over 500 year 11 & 12 students on in Cairns and Townsville for the annual Legal Studies Conference. This year’s conference theme was focused around the Indigenous Voice to Parliament referendum, in addition to covering a range of topics that were highly relevant to the QCAA Legal Studies Syllabus. The conferences included panel discussion on Implied and Express Rights and Law Reform, the Before & After Native Title claim process, and The Voice to Parliament referendum. Conference speakers included Mr Simon Bright, Legal Practitioner, Aboriginal Torres Strait Islander Legal Service (ATSILS), Professor Gary Meyers, Ms Michelle Friday-Mooka Manager of Community Relations, Cape York Land Council, Dr Sana Nakata, Principal Research Fellow at the Indigenous Education and Research Centre and Dr Bill Mitchell, Principal Solicitor at Townsville Community Law.

Australian American Leadership Dialogue delegation to JCU

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

The Development in the Tropics team hosted a delegation of forty leaders from across Australia and the United States on Sunday 6 August 2023 as part of the Australian American Leadership Dialogue (AALD) 2023 Young Leadership Dialogue Alumni (YLDA) Academy. The Academy’s first official event was held at The Cairns Institute. The AALD is a private diplomatic initiative, which brings together Australian and American leaders from government, enterprise, media, education and the community to help review and refine the parameters of the Australian-American bilateral relationship. It aims to strengthened Australian-US partnership on the understanding that the relationship is critical to enhance regional security and help underwrite economic and cultural prosperity, not only for Australians and Americans, but for the entirety of the Indo Pacific region. The YLDA Academy is an important annual forum that the AALD coordinates to provide opportunities for leaders from across industry sectors to engage in meaningful dialogue and learn from thought leaders on issues of importance to the bilateral relationship. The 2023 Cairns Academy Program Manager, Anna Alexander, is a former member of the JCU leadership team and now works for the Office of Northern Australia. Anna was selected for the YLD in 2016 and said the delegation to Cairns provided a significant opportunity to showcase the strategic importance of Northern Australia to current and future leaders. The Academy was opened by dancers from AFL Cape York House, before Professor Allan Dale gave the welcome keynote speech followed by a fireside chat on challenges and opportunities facing the governance of Northern Australia. This was followed by a fireside chat with the Hon Michael Steele, former Lt. Governor of Maryland and the chair of the Republican National Committee 2009-2011. Michael was the first African American to hold both of those posts. Allan and Michael discussed governance issues of mutual relevance to Australia and America.



8.2 SDG 16 Research for Peace, Justice, and Strong Institutions

Trauma and Youth Crime

10 REDUCED INEQUALITIES

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Exposure to more than one adverse childhood events (ACEs) and potentially traumatic events experienced before a child reaches 18 years of age, are a predictor of reoffending in youth crime. Using a systematic review, where several studies are pooled and analysed together, Associate Professor Wendy Li and colleagues found that cumulative ACEs combined with neglect was positively associated with reoffending. Whilst some studies indicated that positive childhood experiences, strong social bonds and gains in empathy could moderate the association between ACEs and reoffending, the evidence was limited, and more research is required.

Link between youth justice system and premature death

10 REDUCED INEQUALITIES

16 PEACE AND JUSTICE STRONG INSTITUTIONS

JCU Professor Alan Clough from took part in a study which found young people who have had contact with the youth justice system are at increased risk of early death, prompting researchers to call for more early intervention programs for at-risk youth. Professor Clough said young people who have contact with the justice system are known to be more likely than other young people to experience suicidal behaviours, violence, and injury, which can lead to premature death. The researchers examined the histories of 48,670 individuals aged 10–18 years charged with a criminal offence in Queensland between 1993 and 2014. Professor Clough said 1431 deaths occurred in that group during the study period, 932 had a known and attributed cause with 121 (13.0%) of these deaths from non-communicable diseases. The rate of deaths from NCDs in the cohort was 70% higher than the general population of the same age and sex in Australia. The study found that rates of death due to cardiovascular and digestive diseases were particularly increased among those with a history of involvement with the youth justice system compared with the general population. Professor Clough said mortality rates due to chronic respiratory diseases were actually lower among people with a history of contact with the youth justice system, and rates of other specific causes of NCD deaths did not differ significantly from the general population.



9.0 SDG 17 JCU Partnerships for the Goals

The Northern Australian Regional Digital Health Collaborative (NARDHC)

3 GOOD HEALTH AND WELL-BEING

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

17 PARTNERSHIPS FOR THE GOALS

JCU is spearheading a project which aims to revolutionise the delivery of digital health care to rural and remote communities in Northern Australia, through technical expansion and innovation, upskilling healthcare providers, and patient education. Funded by a \$2 million grant from the Australian Department of Education, Skills, and Employment (DESE), The Northern Australian Regional Digital Health Collaborative (NARDHC) is a novel partnership between health and digital experts, including CSIRO, Optus, the Cooperative Research Centre for Developing Northern Australia and Northern Queensland Primary Health Network.

Following extensive consultation with key stakeholders throughout the region — such as healthcare providers, healthcare consumers, research institutions, digital health solution providers, and communication organisations — the NARDHC team has begun to roll out initiatives tailored to help address the need for digital education and innovation. Some 60 health and allied health workers are currently enrolled in the NARDHC Digital Health for Rural and Remote Health Micro online credential course developed by JCU experts. It includes a cultural component to help course participants engage effectively with patients online, including the elderly and those living in Aboriginal and Torres Strait Islander communities.

Western Cape Futures Symposium Partnership

2 ZERO HUNGER

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

16 PEACE AND JUSTICE STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

The future of the Western Cape York region was the focus of the recent symposium in Weipa which attracted around 200 people attended across 2.5 days. To date, much of the focus on Northern Australia has been on larger population centres and/or agriculture opportunities. Regions such as Western Cape York have less than 5000 people yet already contribute \$2 billion to Australia's national economy and provides unique opportunities for future development. The region is being proactive about securing its future, which is why nine partner organisations Western Cape Chamber of Commerce, Aurukun Shire Council, Mapoon Aboriginal Shire Council, Napranum Aboriginal Shire Council, the Weipa Town Authority, James Cook University, the Torres and Cape Indigenous Council Alliance, Western Cape Communities Trust, and Rio Tinto, joined together to hold the Western Cape Futures Symposium (WCFS) between the 23-25th March. The priority of the symposium was to create a shared vision for a sustainable and diverse economy, based on the aspirations of the people who call the Western Cape home. JCU Professor Allan Dale led and developed the session on Land Use Planning. He said that Traditional Owners will determine the future of the region for the first time in history. This was echoed by Jim Turnour (CEO, Wuthanthi Aboriginal Corporation) who said, 'You need to put Traditional Owners front and centre with whatever you are doing, and you need to give them time and space. Your ambitions may not be shared.' The TNQ Drought Hub and Director Dr David Phelps also provided significant support for the symposium and continues to support industries in Cape York to strengthen communities.



Western Cape Futures Symposium

JCU-CSIRO Partnership



The JCU-CSIRO Partnership, managed by a Steering Committee and Operational Group, aims to strengthen connections between the two organizations and work collectively to deliver research and innovation benefits for the region. The partnership aims to build Indigenous research capacity and brings together researchers with complementary strengths in diverse disciplines to work with communities in the region on projects to address challenges, including to reduce biosecurity risks and infectious disease vulnerabilities and make the transition to net zero. JCU and CSIRO have co-developed a student-centred initiative to build JCU Indigenous students research capacity and research career pathways (BIRC). The initiative began early in 2022 to learn about the important ways to connect with Indigenous students across JCU and identify a strategy to prioritise student needs in relation to future career goals, research, and alignment with CSIRO as a supportive and meaningful industry partner of JCU's. Students and researchers came together across Cairns and Townsville to discuss and collaborate on a range of initiatives which were developed into a model of engagement between place-based Indigenous communities, CSIRO, JCU and students. In 2023 this important work continued to translate these important relationships and industry partnerships into impactful research and community collaborations for Indigenous futures in Northern Australia.

Reef 2050 WQIP Partnerships



The Reef 2050 Water Quality Improvement Plan 2017-2022 (Reef 2050 WQIP) is a joint commitment of the Australian and Queensland governments that seeks to improve the quality of water flowing from the catchments adjacent to the Great Barrier Reef. The Paddock to Reef Integrated Monitoring, Modelling and Reporting program (Paddock to Reef program) was established in 2009, and will continue to provide the principal framework for evaluating and reporting progress towards Reef 2050 WQIP targets through the Great Barrier Reef Report Card. The program is a collaboration involving Queensland and Australian government agencies, industry bodies, regional Natural Resource Management bodies, landholders, and research organisations. JCU TropWATER is a key scientific partner for the program. JCU TropWATER is also part of regional partnerships to monitor the water quality of the Great Barrier Reef, the Wet Tropics Waterways partnership, and the Dry Tropics Partnership for Healthy Waters.

Wet Tropics Waterways Partnership



JCU TropWATER is a partner in the Australian Government's Wet Tropics Water Way's Partnership, with a vision to improve the health of waterways and quality of water flowing on to the Great Barrier Reef. The partnership collects data to produce a Wet Tropics Waterways Report Cards that assess the condition of nine water catchments and eight estuaries, and inshore and offshore marine zones in the GBR, since 2016. The partnership is an initiative of the Reef 2050 Long-Term Sustainability Plan and includes over 20 financial partners including government, industry, and community groups. The partnership communicates water quality information to increase community knowledge and drive positive change.

Dry Tropics Partnership for Healthy Waters



This similar regional partnership focused on the Townsville dry tropics region and produces the annual Townsville Dry Tropics Waterways Report Card. It is between JCU, Federal and Queensland Governments, AIMS, Port of Townsville, CSIRO, and the Townsville City Council. The focus of the partnership is the freshwater and estuarine environments in Townsville's Black River, Bohle, Magnetic Island and Ross Catchments, from Crystal Creek to Cape Cleveland, including inshore and offshore marine zones.

JCU Centre for International Trade and Business in Asia (CITBA)



CITBA collaborates with esteemed organizations such as Green Spaces, dedicated to promoting sustainable practices and environmental stewardship. CITBA also has a partnership with the Cairns Regional Council to develop strategies that promote sustainable growth, economic prosperity, and inclusive business opportunities within the region. JCU and the Cairns Regional Council signed a memorandum of understanding in October 2019 that resulted in many collaborations, including CITBA. JCU has also signed a partnership agreement between the Open Access Journal of Resilient Economies (JRE) and Informit, and JRE is now included in the Informit database. Informit is an online gateway to the largest collection of Australasian scholarly journals, books, and videos. These partnerships and collaborations exemplify CITBA's commitment to fostering meaningful connections and driving positive change.

Innovation Research Universities Australia (IRU)



In 2007 JCU became a member of the Innovation Research Universities (IRU) Australia. IRU includes Flinders University, Griffith University, Latrobe University, Murdoch University, Western Sydney University, and the University of Canberra. Through its members working collectively, the IRU seeks to be at the constructive centre of Australian university policy making, influencing political developments beyond individual university capacities to do so. The IRU members' research focus is on the translation and commercialisation of research on issues of critical importance to the communities in which they are based and addressing problems of national and global scale. For its 20th anniversary this year, the IRU produced a publication to showcase the impacts of its education and research on regional communities over the past twenty years. Each member university was asked to provide three impact case studies. For JCU, the 3 case studies featured are: the impact of the medical and other clinical schools; the impact of the cyclone testing station on more resilient housing; and the impact Family Wellbeing (FWB) empowerment training on First Nations Community wellbeing.

The Fresh and Secure Trade Alliance (FASTA)



The Fresh and Secure Trade Alliance is a partnership between Hort Innovation, the Department of Agriculture and Fisheries Queensland, the Department of Primary Industries and Regional Development (WA); the Queensland University of Technology, the Department of Energy, Environment and Climate Action (VIC), the Western Sydney University, the Department of Tourism, Industry and Trade (NT), the Australian Blueberry Growers' Association, James Cook University, the Department of Primary Industries and Regions (SA) and GreenSkin Avocados, with levy funding from the avocado and strawberry industries, and support from the Albanese Government. The Alliance program is a \$130 million historic trade initiative to protect and grow Australia's horticultural exports led by the Queensland Department of Agriculture and Fisheries. The research program is focused on providing datasets to demonstrate Australia is pest free and ensuring the impact of phytosanitary treatments on fruit quality is minimized and increasing understanding about fruit fly and other pests.

Townsville Chamber of Commerce



The Townsville Chamber of Commerce delivers a 'Pathways to Success' program which provides professional development opportunities for current JCU students to upskill and assist students in getting 'job-ready' for the workplace.

Australian Festival of Chamber Music Sponsorship



JCU is a platinum partner of the Australian Festival of Chamber music. In July 2023 the Felix Quartet performed at Central Plaza on the Townsville, Bebegu Yumba campus, as part of the University's sponsorship of the Australian Festival of Chamber Music.

Advance Cairns



Advance Cairns is the peak independent advocacy and economic development organisation for Far North Queensland. They are a not-for-profit, non-partisan body which works beyond election cycles to deliver a stronger, more prosperous future for the region. JCU is a member of Advance Cairns and works with organisation to advocate for government support on projects of strategic importance to the region. JCU has also partnered with Advance Cairns to host industry breakfast events featuring influential speakers on topics relevant to the Far North. Professor Simon Biggs, Vice Chancellor and President is a Director of Advance Cairns.

Townsville Enterprise



Townsville Enterprise is the peak economic development and destination management organisation for Townsville North Queensland. For more than 30 years, Townsville Enterprise has played a critical role in leading the economic progress for the region through strong political advocacy, investment attraction, tourism development and by promoting Townsville North Queensland as a place to visit, invest and live. JCU is a member of Townsville Enterprise and partners with the organisation to foster learning and professional development opportunities through the Future Leaders program and to host industry breakfast events featuring influential speakers on topics relevant to the North. JCU works with the organisation to advocate for government support on projects of strategic importance to the region. Professor Simon Biggs, Vice Chancellor and President is a Director of Townsville Enterprise.

9.1 Dialogue for the Sustainable Development Goals

JCU Research Ethical Development (RED) Symposium

The 2023 RED symposium was held on the 27-29 of September, titled: "A Broken Promise? The 2030 Agenda's Commitment To Leave No-one Behind", setting out a vision for sustainable development that places equality and non-discrimination at the centre of its efforts. To achieve this, the Agenda has the core commitment 'to remain steadfast in ensuring that the Sustainable Development Goals (SDGs) are implemented in accordance with international human rights law, eliminating gender inequalities and all forms of discrimination, [and] reaching out to those that are furthest behind first. The 2023 JCU RED symposium seeks to grapple with the 2030 Agenda's 'central transformative promise' to Leave No One Behind through a focus on three themes: power; discrimination; systemic injustice. The Cairns Institute Fellow Dr Kearrin Sims coordinates the JCU Research Ethical Development Symposium, now in its second year.

2023 Public seminar: Environmental Outcomes of Chinese Outward Foreign Direct investment (COFDI) in Southeast Asia

Professor May Tan-Mullins, Chief Sustainability Officer, Dean International, JCU Singapore, spoke about the undisputable significance of China in global environmental issues. Chinese companies inevitably impact on the environment and social contexts of the recipient countries. In particular, the ASEAN countries have been severely impacted as Chinese outward foreign direct investment (COFDI) has been flowing into this region at an unprecedented rate in recent years. This is partly due to the Belt and Road Initiative (BRI) and regional demand for Chinese investment and trade. COFDI is much welcomed by these countries as it brings economic benefits and enables the pursuit of national development schemes. However, the outcomes of these COFDI projects on the economic, political, cultural, and environmental fabric of host countries have been dramatic, as it often involves a shift of power configuration and resource ownerships between different stakeholders. Drawing from evidence in three Southeast Asia countries (Cambodia, Vietnam, and Malaysia), this paper investigates how variables such as host country regime type and relations with China, and its' local capacity to enforce laws and regulations, shape the environmental outcomes of COFDI. The findings of this paper will inform the mitigation strategies of the environmental implications arising from these COFDI.



10.0 JCU Future sustainability plans

10.1 Australian Universities Accord Final Report



In February 2024 JCU welcomed the Australian Universities Accord’s final report, particularly its recommendation for a needs-based funding model that would increase participation in post-school education in regional and remote areas. In its submission to the Accord, JCU highlighted that the current volume-based university funding system penalises regional universities who, by virtue of their location, simply cannot scale in size through domestic or international student numbers, creating disadvantage in the communities that regional universities serve. The Accord’s final report recommends the introduction of a needs-based funding model that acknowledges the cost of providing additional academic and other support, the locality of the institution they attend, and rewards student completions. Prof. Biggs said the governance reforms would provide an important opportunity to rebalance arrangements for regional universities

enabling place-based agreements between universities, Governments and communities which supports accountability for outcomes. Prof. Biggs said educational attainment rates in northern Queensland need to be raised, and the Accord report identifies ways government and universities can work towards that goal.

“Recommendations that see students paid when on placements will relieve some of the real financial barriers for our future nurses and teachers face, and the Report’s recognition that increasing medical places in regional universities is the key to graduating rural and remote doctors and delivering health equity to regional communities is significant. We are also particularly pleased by a recommendation for uncapped medical places for First Nations’ students who meet the entry requirements for a medical degree. These recommendations are great news for regions such as ours and would deliver more opportunities for regional and remote students. We need to ensure equitable access to quality education for all regardless of background or location. There needs to be greater support for underrepresented students in regional areas including lower socioeconomic students. We want to increase participation and attainment rates in the north, as our communities deserve a more equitable approach.”



JCU Students, Eddie Koki Mabo Library

10.2 JCU sustainability plans for 2024 and beyond

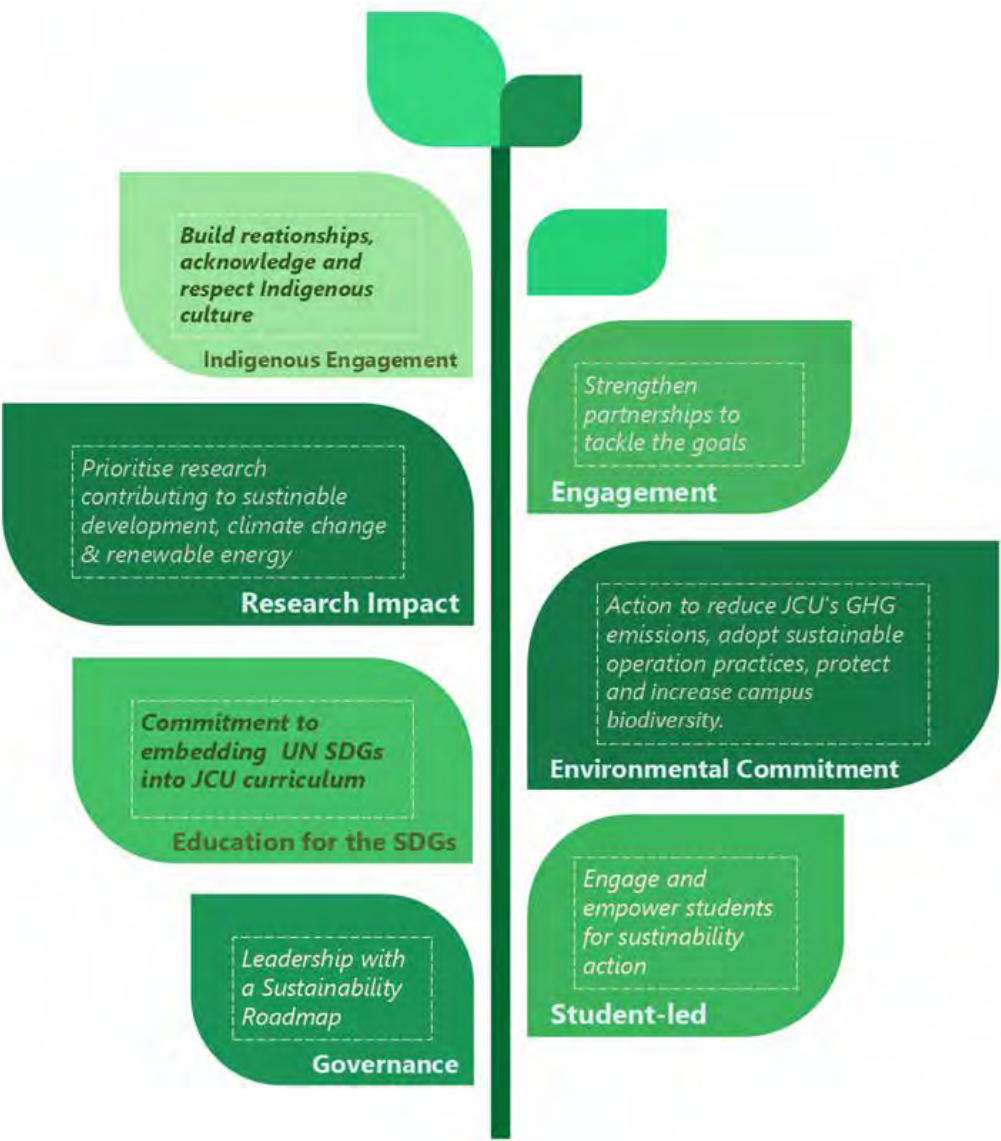
JCU is shaping a sustainable future for students, staff and the community through its journey to carbon neutrality. JCU is creating a Sustainability Roadmap, taking stock of our progress at the halfway point to the UN SDGs in the 20230 Agenda for Sustainable Development, and setting actins for the future. The Roadmap will include a Carbon Management Plan journey towards carbon neutral, actions for governance, research, education, commitment to sustainable operations, diversity, equity and inclusion and increased engagement with students and staff. The Roadmap will also further the goals of the Reconciliation Action Plan by incorporating Indigenous knowledge in Caring for Country in environmental sustainability actions.

JCU plans to demonstrate climate leadership by creating a climate change risk and resilience adaptation strategy. This will involve a risk assessment of JCU’s critical campus assets, operations, business

continuity, for vulnerability to environmental stresses increased by climate change (cyclones, intense rain events, heatwaves). JCU also plans to strengthen policy for sustainability to help meet the UN SDGs in our research, teaching and operations, and increase ESG ratings in a sustainable investment portfolio. Research focus areas include climate change impact and adaptation, improving tropical health, sustainable development and renewable energy innovations to contribute to a sustainable future for life in the tropics.

Protecting the beautiful biodiverse tropical JCU campuses will always be a priority for JCU, including reducing weed species, revegetating brownfield sites, protecting creek and riparian areas from development and protecting threatened species that live on campus. Further efforts to conserve water use in buildings and gardens, and reduce waste through innovative waste management solutions are also part of JCU’s future plans. Increasing student and staff engagement in sustainability actions will be key to meeting JCU’s sustainability goals across social, economic and environmental sustainability targets.

Figure 10.2 JCU Future Plans



11.0 Acknowledgements

This Sustainability Report was initiated by Patricia Brand, the JCU Deputy Vice Chancellor, Services and Resources Division, and is led by Holly Smith, Sustainability Officer. It is a collective, collaborative work of many, and we thank everyone for their contributions:

Emmanuel Acheampong	Danella Forster	Aliyah Ravat
Lisa Arnell	Alicia Fowles	Jeffrey Reddy
Frances Atkins	Wendy Ganly	Jenny Seddon
Hurriyet Babacan	Joel Groberg	Adrian Shatte
Ben Backhouse	Ryl Harrison	Nathan Shepherd
Olga Bazaka	Conrad Hoskin	Kate Sheppard
Lisa Brennan	Lisa James	Andrea Sherritt
Kirrilee Browning	Dean Jerry	Renee Simkins
Damien Burrows	Noel Kiuk	Kearrin Sims
Richard Cook	Susan Laurence	Peter Sonntag
Allan Dale	William Laurence	May Tan
Rae Doble	Cameron LeBherz	May Tan-Mullins
Damian Dunne	Rebecca Lee	Laurence Tapp
Maria Edmondstone	Stewart Lockie	Dave Waters
Brandan Espe	Dean Maher	Tania Wilmann
Melanie Ferris	Nigel Marsh	Vyvyen Wong
Ashley Field	Rachel Pappas	Mykala Wright
Elle Forbes	Annette Quagliata	Daniel Zamykal



Central Plaza, JCU Townsville

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