

NORTHERN INSIGHTS

Northern Australia: A Region of Opportunity.

ISSUE 01



**NORTHERN
AUSTRALIA
UNIVERSITIES
ALLIANCE**



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NORTHERN AUSTRALIA: A REGION OF OPPORTUNITY

Northern Australia has vast potential that stands to benefit the entire nation in economic, social, environmental and cultural terms. At the same time, it faces a range of unique and complex challenges.

**NORTHERN
AUSTRALIA
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CQUniversity
AUSTRALIA



**CHARLES
DARWIN
UNIVERSITY**
AUSTRALIA



**JAMES COOK
UNIVERSITY**
AUSTRALIA

In response, successive Australian Governments have developed standalone policy frameworks for Developing Northern Australia. In support of this national mission, the Northern Australia Universities Alliance (NAUA) brings together universities based in and linked to Northern Australia to drive positive change through education, research, and meaningful partnerships with local communities.

Five change drivers will underpin progress:

1. Why the North Matters

Northern Australia is essential for Australia's economic potential, national security, environment, trade and proximity to Asia.

2. Supporting Indigenous Futures

The North is an Indigenous Domain. By supporting Indigenous-led and self-determined development and education, we strengthen our communities.

3. Driving Economic Growth Through Innovation

Northern Australian regions tend to have boom and bust economies. To build depth and resilience in our economies, the Northern universities lead research and innovation, creating jobs, attracting industries, and fuelling local economies.

4. Building an Inclusive, Equitable North

Through collaboration with government, industry, and communities, we work to ensure opportunities for all Northern Australians. Building capacity in situ in the north creates lasting positive change within a rapidly transitioning and decarbonising economy.

5. Valuing Northern Environments and Cultures

Northern Australia's unique ecosystems and cultural heritage are national assets. We champion sustainability and cultural respect through research, education, and partnership.

Northern Australia is essential for Australia's economic potential, national security, environment, trade and proximity to Asia.



Parliamentary Friends of Northern Australia, NAUA Event held on 10th of February 2025, Speaker's Courtyard - Parliament House Canberra. Left to Right: Luke Gosling OAM MP - Special Envoy for Defence, Veterans' Affairs and Northern Australia, Professor Simon Biggs - JCU Vice Chancellor, The Hon Milton Dick MP - Speaker of the Australian House of Representatives, Professor Scott Bowman AO - CDU Vice Chancellor, Senator Susan McDonald - Shadow Minister for Resources and Northern Australia and Professor Nick Klomp - CQUniversity Vice Chancellor.



The NAUA offers Government and industry funders the collective expertise and local knowledge of researchers engaged in applied projects that make a difference.

Parliamentary Friends of Northern Australia, NAUA Event held on 10th of February 2025, Speaker's Courtyard - Parliament House Canberra.

DRIVING CHANGE THROUGH INNOVATIVE RESEARCH IMPACTING COMMUNITIES.

The collaborative strengths of the three Northern Australian Universities places NAUA in a unique position to facilitate meaningful research projects that address the challenges that face communities and industry in this region.

The NAUA offers Government and industry funders the collective expertise and local knowledge of researchers engaged in applied projects that make a difference.

NAUA brings together this expertise and knowledge in a collaborative network of applied research projects. This collaboration maximises research funding return on investment and delivers unprecedented results in a vital economic and cultural area of Australia.



Image Credit: Charles Darwin University.

NAUA maintains a strong partnership with the CRCNA to co-design research and development priorities and align them with investment opportunities across Northern Australia.

WATER SECURITY

Through strategic collaborations, NAUA is fostering advancements in water security, agricultural innovation, environmental sustainability, and workforce capacity building.

Gilbert River catchment, north Queensland.
Photography Courtesy: CRCNA.



Above: Daly River, Northern Territory. Photography Courtesy: B. Carlson CRCNA.

Ord River Irrigation Area (ARIA), Western Australia.
Photography Courtesy: B. Carlson CRCNA.

WSNA is helping Northern Australia balance economic growth with environmental sustainability, ensuring long-term water security.

ENSURING WATER SECURITY FOR NORTHERN AUSTRALIA

A partnership between the Cooperative Research Centre for Developing Northern Australia (CRCNA) and NAUA, the **Water Security for Northern Australia (WSNA)** Program tackles critical water resource constraints across four major northern water catchments:

- ▶ Lower Fitzroy catchment, Central Queensland
- ▶ Gilbert River catchment, North Queensland
- ▶ Daly River catchment, Northern Territory
- ▶ Ord River Irrigation Area, Western Australia

The WSNA program delivers vital research co-designed with stakeholders, resulting in:

- ▶ Enhanced environmental outcomes through improved water quality monitoring.
- ▶ More efficient development assessments via critical resource data.
- ▶ Cost reductions for environmental monitoring, benefiting governments and farmers.
- ▶ Enhanced water resource allocation and management decisions.
- ▶ Increased opportunities for Indigenous communities to access and benefit from water resources.

By integrating scientific research with practical applications, WSNA is helping Northern Australia balance economic growth with environmental sustainability, ensuring long-term water security.



AGRICULTURE

DRIVING AGRICULTURAL INNOVATION THROUGH RINA

The Research Institute for Northern Agriculture (RINA), a collaboration between CDU, JCU, CQUniversity, and Murdoch University, was officially launched on April 30, 2024, at CDU's Casuarina Campus.

Professor Sunil Kadri, Research Institute for Northern Agriculture.

Supported by the Australian Government's **Regional Research Collaboration (RRC) Program**, RINA is dedicated to advancing sustainable agriculture and aquaculture industries.

RINA's objectives include:

- ▶ Strengthening industry-research partnerships to solve agricultural challenges.
- ▶ Supporting First Nations enterprises in agriculture and aquaculture.
- ▶ Driving economic growth through innovation and research excellence.

Through strong partnerships with organisations like NT Farmers, NT Cattlemen's Association, NT Seafood Council, and the NT Government, as well as academic institutions like James Cook University, CQUniversity, and Murdoch University, RINA is poised to champion the growth agenda of primary industries. This includes supporting First Nations enterprises and fostering sustainable development.

RINA held the 1st Northern Australia Universities Alliance Postgraduate Research Conference in April 2025. Postgraduate students from CQUniversity, Charles Darwin University and James Cook University presented research across key disciplines such as:

- ▶ Livestock production and Indigenous food systems.
- ▶ Supply chains and rangeland management.
- ▶ Diversification, cropping, biosecurity, and aquaculture.

The conference also featured science communication workshops, equipping students with skills to engage wider audiences with their research.

RINA projects of note include researchers working with the Northern Territory's Department of Industry, Tourism and Trade (DITT) to study biting midges, or *Culicoides*, and their ability to carry potentially serious or severe disease that can affect Australian livestock. RINA researchers are also collaborating with DITT to learn how cotton responds to the Northern Territory's rainfall patterns, aiming to help develop a sustainable and resilient industry not reliant on irrigation.



Main Image: CRCNA Supply Chains Northern Territory.
Inset: CRCNA Supply Chains Tiwi Islands.
Photography Courtesy: B. Carlson CRCNA.

PRODUCTION AND SUPPLY CHAIN INNOVATION IN NORTHERN AUSTRALIA

The NAUA has partnered to explore innovative approaches to agricultural supply chain redesign in Northern Australia.

The CRCNA funded report, *Reframing Smart Supply Chains in Northern Australia*, provides fresh insights into how supply chains can become more efficient, agile and sustainable through industry collaboration, strategic investment, and policy reform.

The report drew on a wide range of research methods, including environmental scans, stakeholder analysis, and in-depth engagement with over 85 participants from across government, industry, education, and regional development bodies.



The report presents 14 practical recommendations across 8 key themes, such as infrastructure development, enabling investment, workforce planning, and building international market connections—particularly with Asia and the Pacific.

By rethinking traditional supply chain management approaches, the report sets out a roadmap to enhance Northern Australia's agricultural competitiveness and support long-term regional economic growth.

Currently, Professor Hurriyet Babacan and Professor Delwar Akbar are advancing this work through CQUniversity's Centre for Regional Economies and Supply Chains (CRESC) in collaboration with Charles Darwin University and James Cook University. Professor Babacan holds a conjoint appointment between James Cook University and CQUniversity, linking CRESC and The Cairns Institute. This research spans multiple industries, with a focus on digital innovation, workforce development, and the export readiness of northern supply and value chains.





GREAT NORTHERN SPICES: CULTIVATING A NEW INDUSTRY FOR NORTHERN AUSTRALIA

Great Northern Spices a collaborative project between the Cooperative Research Centre for Developing Northern Australia (CRCNA), AgriVentis Technologies, and CQUniversity alongside a range of collaborative partners, is set to transform spice production in the region.

Aiming to equip growers with the knowledge and tools to successfully integrate spice crops—such as sesame, kalonji, and fennel—into existing northern farming systems.



CRCNA Sesame Launch Rockhampton, CRCNA Senior Project Manager Dr Ian Biggs, CQUniversity Vice-Chancellor and President Professor Nick Klomp, Minister for Northern Australia Madeleine King. Photography Courtesy: AgriFutures Australia.

Research focuses on best-practice planting protocols, pest and disease management, machinery optimisation, and post-harvest processing to ensure high-quality products. Additionally, the project will provide economic insights, including gross margin analyses and value chain opportunities, to support the commercial viability of a Northern Australian spice industry.

With strong domestic and international market demand, forecasts predict that by 2026, Northern Australia could sustain at least 5000 hectares of sesame, 1000 hectares of kalonji, and 500 hectares of fennel. Increased yields and optimised production methods are expected to drive significant economic benefits for farmers, positioning Northern Australia as a key player in the global spice market.

MINIMISING CALF LOSS IN NORTHERN BEEF HERDS.

Reducing cow and calf mortality is vital for improving the sustainability and profitability of Northern Australian beef herds, where calf loss costs the industry over \$53 million annually.

With support from Meat & Livestock Australia (MLA), CQUniversity addressed this challenge using precision livestock technologies. CQUniversity's contribution involved developing and validating on-animal sensors to monitor behavioural and physiological responses

of cows and calves to increasing heat load. Significant behavioural changes were identified including reduced rumination, altered grazing patterns to cooler periods, increased use of shade and water, and elevated rumen temperatures. Analysis confirmed that mean temperature alone effectively indicated heat stress impacts, simplifying practical assessment for extensive systems. This research enables better understanding of how factors like shade, water access, and maternal nutrition influence calf survival. The insights will guide large-scale deployment of monitoring technologies and inform management strategies to reduce mortality.

Image Credit: CQUniversity.

With support from Meat & Livestock Australia (MLA), CQUniversity addressed this challenge using precision livestock technologies.



HEALTH AND HEALTH SERVICES

HIGH STAFF TURNOVER IN REMOTE HEALTH SERVICES

Charles Darwin University,
Student, Darwin Hospital.

A Menzies School of Health Research study has revealed an average staff turnover rate of 151% per year at Aboriginal Community Controlled Health Service (ACCHS) clinics in regional and remote Northern Territory and Western Australia.

The study, published in *Human Resources for Health*, found that the turnover of Aboriginal staff was half that of non-Aboriginal staff, suggesting that local hires could improve stability.

Analysing payroll data from 11 ACCHSs serving about 63,500 Aboriginal people, the study found that turnover increased with remoteness, leading to higher service delivery costs. This reliance on short-term staff and frequent recruitment cycles strains resources. The study calls for more equitable, needs-based funding for remote ACCHSs.

Reducing turnover improves continuity of care, preserves local knowledge, and fosters trusting relationships. Employing more Aboriginal staff could stabilise staffing, but this requires expanded training and career pathways. The research is part of a broader program studying the impact of short-term staffing on Aboriginal health services.



James Cook University, Indigenous Education & Research Centre, Medical Student, Townsville.

INNOVATING HEALTH SERVICE DELIVERY IN NORTHERN AUSTRALIA

This Cooperative Research Centre for Developing Northern Australia (CRCNA) funded project is shaping the future of health service delivery across Northern Australia by identifying key challenges, opportunities, and priorities for investment.

Covering infrastructure, clinical issues, policy, new models of care, and workforce development, the initiative explores strategic research and alternative solutions to strengthen the sector.

A consortium of health service providers including James Cook University, Cairns and Hinterland Hospital and Health Service, on behalf of the Tropical Australian Academic Health Centre, NT Top End Health Service and The Rural Clinical School of Western Australia, University of Western Australia bringing deep expertise in Indigenous health, tropical medicine, and regional service delivery collaborated on the situational analysis. Their involvement ensured the findings were grounded in real-world experience, creating a strong foundation for sector-wide collaboration and future growth.

The resulting report provides a roadmap for prioritising, delivering, and evaluating research in health service innovation. By fostering a systematic and collaborative approach, the project aims to drive meaningful improvements in healthcare access and outcomes across Northern Australia.



TELEHEALTH RESEARCH AIMS TO IMPROVE HEALTHCARE ACCESS IN NORTHERN QUEENSLAND

Researchers in northern Queensland will explore the use of telehealth to enhance digital health and improve healthcare access for rural and remote residents.

Led by James Cook University's Professor Sarah Larkins, the project, funded by a nearly \$1 million grant from the National Health and Medical Research Council, will map existing telehealth usage and work with patients and providers to optimise its effectiveness.

Northern Queensland, with over 700,000 residents spread across 950,000 square kilometres, has used telehealth for some time, but there is limited guidance on how to use it effectively in rural and remote areas. The team aims to create a roadmap for telehealth implementation, providing guidance for both providers and users, with potential nationwide benefits.

Telehealth has proven clinically effective, safe, and widely accepted, but challenges remain. Professor Larkins cited the example of Norway, where telehealth use for hospital appointments declined despite early adoption. By identifying barriers to telehealth access, the team hopes to ensure better healthcare access for all Australians, regardless of location. The project will run for five years.

HEALTH WORKFORCE OVERHAUL PLANNED

James Cook University Professor Stephanie Topp has secured nearly \$1.5 million from the National Health and Medical Research Council to transform health workforce policy over the next five years.

Her research will focus on three key areas: assessing workforce supply, distribution, and performance; analysing political and economic influences on policy; and overcoming barriers to implementing evidence-based strategies.

Professor Topp aims to develop a policy framework that addresses Australia's complex, federalised health system and improves equity. Regional, rural, and remote areas face 1.4 times more disease and 2.5 times greater injury burden than cities yet have nearly 50% fewer health professionals per capita.



James Cook University, Professor Stephanie Topp.

By evaluating the political and economic factors shaping workforce policy, the project seeks to create a streamlined, equity-focused framework to guide policymakers. The work begins in 2025 as one of 34 projects funded nationwide in the NHMRC's 2024 Investigator Grant round.



NACAS is collaborating with the Red Lily Health Board to trial flying drones, known as BiBi planes, from the Jabiru Health Centre to the Gunbalunya Clinic and back.



DRONES TO DELIVERY CRUCIAL MEDICAL SUPPLIES

Researchers at CDU's North Australia Centre for Autonomous Systems (NACAS) are undertaking two separate projects on using drones to deliver important medical supplies.

NACAS is collaborating with the Red Lily Health Board to trial flying drones, known as BiBi planes, from the Jabiru Health Centre to the Gunbalunya Clinic and back. This distance is about 57km, and the drones can carry up to 3kg and fly 80km at 100km/h.

The three-month trial is being led by NACAS Director Professor Hamish Campbell and aims to conquer the tyranny of distance, streamlining a process which takes many hours to a mere 30 minutes.

INDIGENOUS LEADERSHIP AND FUTURES

ARC CENTRE OF EXCELLENCE FOR INDIGENOUS AND ENVIRONMENTAL HISTORIES AND FUTURES (CIEHF)

CIEHF Centre Directors – Distinguished Professor Sean Ulm, Sir John Monash Distinguished Professor Lynette Russell & Professor Michael-Shawn Fletcher CIEHF Centre Launch at JCU Nguma Bada Campus, Cairns. Photography Courtesy: Brad Newton Photography.

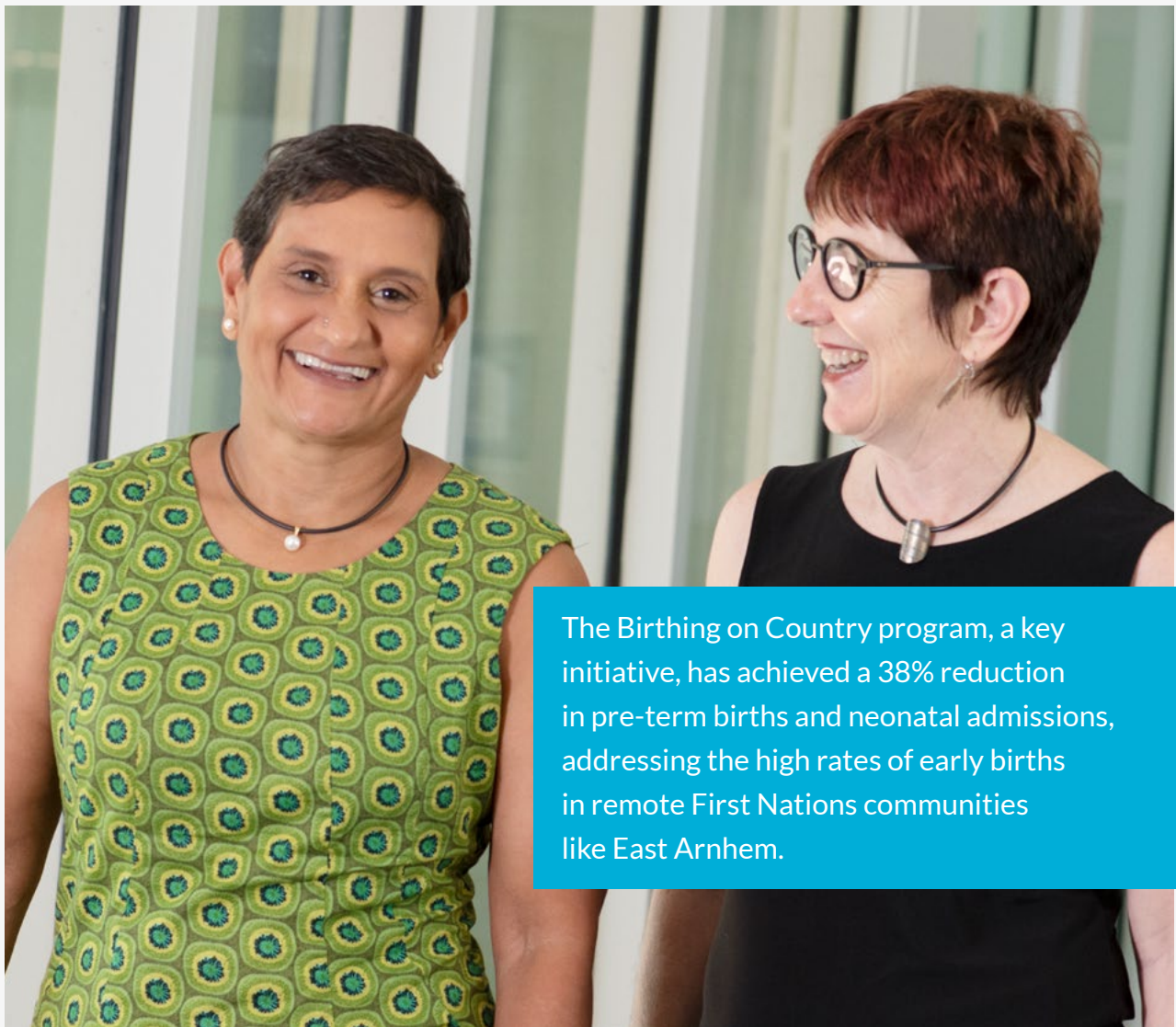
The ARC Centre of Excellence for Indigenous and Environmental Histories and Futures brings together Indigenous Partner Organisations, Universities, Industry, and a diverse network of collaborators from across Australia and beyond.

At its core is a commitment to Indigenous-led, authentically co-designed research that respects and uplifts community knowledge and priorities. This unique alliance combines Indigenous and Western knowledge systems, fostering a collaborative approach to understanding the past and planning for the future.

By drawing from disciplines such as Indigenous science, history, archaeology, and ecology, the Centre is transforming how research is done with Country and creating new pathways for caring for Land and Sea Country.

It is committed to empowering a new generation of Indigenous and non-Indigenous researchers to lead transformative, place-based research across Australia.





The Birthing on Country program, a key initiative, has achieved a 38% reduction in pre-term births and neonatal admissions, addressing the high rates of early births in remote First Nations communities like East Arnhem.

MOLLY WARDAGUGA INSTITUTE FOR FIRST NATIONS BIRTH RIGHTS

The Molly Wardaguga Institute for First Nations Birth Rights at CDU focuses on improving maternal health through a community-driven, First Nations perspective.

Established in 2019, the Institute aims to dismantle colonial barriers in birthing and maternal healthcare by redesigning healthcare systems, investing in culturally appropriate workforces, and empowering self-determination.

Molly Institute Director, Professor Yvette Roe.
Image Credit: Charles Darwin University.

The Birthing on Country program, a key initiative, has achieved a 38% reduction in pre-term births and neonatal admissions, addressing the high rates of early births in remote First Nations communities like East Arnhem. The program combines Yolŋu and non-Yolŋu knowledge to improve health outcomes.

Molly Institute Director, Professor Yvette Roe, a proud Njikenawu woman, emphasises that the program focuses on justice, empowering communities, and fostering collaboration to redesign maternity practices for better health and social outcomes, contributing to intergenerational nation-building.



Torres Strait Photography Courtesy: J McHugh.

STUDY TO EMPOWER TORRES STRAIT ISLANDERS IN SHAPING THEIR FUTURE

James Cook University researchers, led by Associate Professor Sana Nakata, will explore how Torres Strait Islanders have historically interacted with outsiders and adapted to government policies. The study aims to improve Indigenous engagement with governments today.

Despite ongoing challenges, including the Productivity Commission's findings on poor life outcomes for Indigenous people, this study focuses on Torres Strait Islander agency. It will examine how Islanders navigated legal and policy frameworks over the past century while preserving their traditional way of life.



Associate Professor Sana Nakata.

Through archival research, interviews, oral histories, and community workshops, the project will empower Indigenous narratives, support cultural preservation, and inform policy development.

Associate Professor Nakata emphasised the importance of centring Islander perspectives to highlight their history of political action and self-determination. The five-year project has been funded with a \$1.7 million grant from the Australian Research Council.

ARTS-BASED RESEARCH TO IMPROVE INDIGENOUS WELLBEING

CQUniversity researchers have received \$867,741 from the Australian Research Council's Discovery Indigenous grant to fund a groundbreaking project aimed at improving Indigenous health and wellbeing.

The five-year project, *Dandhigu Yimbana: Listening on Country for Social and Emotional Wellbeing*, will explore how arts-based research and deep listening practices can help close the gap in Indigenous health, building on Indigenous ways of knowing and doing.

Led by Dr. Vicki Saunders, a proud Gunggari woman, and Professor Janya McCalman, the project will assess the effectiveness of Arts-Informed Indigenous Research (AIIR) in promoting cultural safety and improving health outcomes. The project aims to contribute to Indigenous health reforms and extend international evidence supporting the role of the arts in promoting health equity.

Dr. Saunders, also a key contributor to the STAUNCH project focused on Indigenous self-governance and health, emphasised the importance of community-led research in creating meaningful change. The Jawun Research Centre, where the project is based, aims to support Indigenous self-determination through culturally respectful research practices.

Northern Indigenous Futures Leaders: Professor Adrian Miller - CQUniversity Vice President Indigenous Engagement, Professor Martin Nakata - JCU Deputy Vice Chancellor Indigenous Education and Strategy, Professor Reuben Bolt - CDU Deputy Vice Chancellor First Nations Leadership. Photography Courtesy: B. Orr.



INSPIRING THE FUTURE NORTHERN AUSTRALIA WORKFORCE STARTS EARLY

A new generation of scientists, engineers, and innovators is emerging across Northern Australia, thanks to inspiring programs delivered by the NAUA. From hands-on STEM roadshows to Indigenous education initiatives, these programs are equipping young minds with the confidence and skills to pursue careers that will shape the region's future.



Image Credit: James Cook University, Townsville.

CDU'S RADICLE ROADSHOW BLASTS OFF WITH AUSTRALIA'S FIRST ASTRONAUT

Science and space are taking centre stage in the Northern Territory, with Charles Darwin University's (CDU) Radicle Centre leading a dynamic STEM roadshow to remote communities.



This year, the program has reached new heights, featuring Australian astronaut Katherine Bennell-Pegg in partnership with the Australian Space Agency.

Now in its sixth year, the roadshow is visiting schools, libraries, and auditoriums, ensuring young people across the Top End can experience the wonders of Science, Technology, Engineering, and Mathematics (STEM). Through interactive sessions like building solar-powered fans, crafting water microscopes, and racing Lego cars, students are discovering the endless possibilities STEM careers offer.

"One of the best parts of my job is meeting young Australians and exciting them about space and STEM," said Ms. Bennell-Pegg. "STEM is not just for scientists in white coats—it's for anyone, anywhere, with the passion to explore and create."

Left: Australian astronaut will tour the Top End with CDU Radicle Centre's Roadshow. Photography Courtesy: Eugene Hyland.

ATSIMS: MERGING INDIGENOUS KNOWLEDGE WITH MARINE SCIENCE

For Aboriginal and Torres Strait Islander students in North Queensland, JCU's Aboriginal and Torres Strait Islander in Marine Science (ATSIMS) program is opening doors to careers in marine conservation.

In 2024, nearly 70 students from 18 schools explored the marine world through field training, snorkelling trips, and cultural engagement with Indigenous Land and Sea Rangers. They participated in real-world scientific initiatives, collecting data for programs like Eye on the Reef and MangroveWatch.

Dr. Allison Paley, ATSIMS coordinator, emphasised the importance of representation in marine science. "It's critical that students see role models who look like them in this industry," she said.

For Ingham State High School student Alexa Campbell-Chiesa, the program was a revelation.

"It helped me decide if I want to pursue a career in marine science," she said. "Exploring the reef and learning from Indigenous experts was incredible."

Students participating in JCU's 2024 Aboriginal and Torres Strait Islander Marine Science program.
Photography Courtesy: @lauraboderke.





Image Credit: James Cook University, Summer School Participants.

JCU'S INDIGENOUS SUMMER SCHOOL PAVES THE WAY FOR UNIVERSITY SUCCESS

James Cook University (JCU) is helping Indigenous students take their first steps into higher education with its Indigenous Summer School program.

Held at the Bebegu Yumba campus in Townsville, the free, week-long initiative introduces students to university life while strengthening their skills in mathematics, literacy, and essential study techniques.

For students like Emily Waters, a Kirwan State High School graduate, the program has been a game-changer. "It's good to see what it's like to be at uni, to gain a bit of independence, and meet the people who will support me throughout my studies," she said.

Mareeba High School student Regan Deshong, still undecided about his future, now sees university as a real possibility. "I might take a gap year, but after that, I'd love to study land management at JCU and become a ranger like my dad," he shared.

The Indigenous Education and Research Centre (IERC) is at the heart of this initiative, offering ongoing support and mentorship. With a proud track record of over 120 Indigenous graduates each year in fields like Occupational Therapy, Pharmacy, Midwifery, and Medicine, the program continues to empower the next generation of Indigenous professionals.

CQUNIVERSITY'S INDIGENOUS STEM PROGRAM LAUNCHES IN GLADSTONE

At CQUniversity (CQU), First Nations high school students in the Gladstone region have dived into STEM education through the Monadelphous CQUniversity Indigenous STEM program. Over two days, students from Toolooa and Gladstone State High Schools explored robotics, map creation, and real-world STEM applications.

Right: Year 10 and 11 students from Toolooa State High and Gladstone State High schools learned about map creation at the Monadelphous CQUniversity Indigenous STEM program.

Linda Pfeiffer, CQU's Deputy Dean of Research, highlighted the significance of industry partnerships. "Students toured Monadelphous, where they got hands-on experience with engineering equipment and met professionals in STEM careers," she said. "It helped them see how their studies connect to future jobs."

With support from Monadelphous and Australia Pacific LNG, the program is fostering a strong pipeline of Indigenous talent for STEM industries in the region.



BUILDING THE FUTURE WORKFORCE, ONE STUDENT AT A TIME

From astronaut-led STEM roadshows to immersive university experiences, NAUA's programs are creating pathways for young people across Northern Australia to thrive.

These initiatives are breaking down barriers, nurturing local talent, and ensuring the region has a workforce equipped to tackle the challenges and opportunities of the future.

Image Credit: MiroDrone, Charles Darwin University.



DECARBONISING THE NORTHERN ECONOMY

TROPICAL NORTH QUEENSLAND
DECARBONISATION AND REGIONAL
DEVELOPMENT SHOWCASE
AND DIALOGUE



Kids Care About Climate Change.: Children from 213 schools in 33 nations have sent world leaders a message about climate change by flying a 7 X 4 metre banner from James Cook University's 47-metre-high crane at the Daintree Rainforest Observatory.

In a rapidly decarbonising world, Far North Queensland presents both significant opportunities and complex challenges.

As an anchor institution in the region, James Cook University (JCU), in partnership with the Queensland Decarbonisation Hub, Regional Development Australia (RDA) Tropical North, RDA Townsville and North West, and the Rural Economies Centre of Excellence, convened the Tropical North Queensland (TNQ) Decarbonisation and Regional Development Showcase and Dialogue in Cairns and Townsville

These showcases highlighted both the progress underway and the potential for collaborative action across the region. Bringing together over 150 participants from government, industry, research, and community sectors to discuss how to align decarbonisation strategies with regional development goals.

The Cairns event featured speakers such as the Hon. Craig Crawford, Jennifer Yarnold, Professor Jenny Seddon, and Lizzie Webb, alongside representatives from MSF Sugar and Cairns Airport. The Townsville dialogue welcomed speakers from Powerlink and the Association of Mining Exploration Companies, among others.

James Cook University, Townsville - Decarbonisation and Regional Development Showcase and Dialogue.
Photography Courtesy: J McHugh.

Each forum provided a platform for regional stakeholders to share their priorities and shape the direction of JCU's future action on decarbonisation. Facilitator Professor Allan Dale emphasised the importance of industry and community voices in driving regionally grounded solutions for a net zero future.

Linked to the work of the Decarbonisation Hub, CQUniversity and JCU are collaborating on a joint project titled Transitioning to Net Zero: Exploring Preferences and Regional Strategies for Decarbonisation in Queensland. This project investigates regional trends in North Queensland's energy transition preferences, perceived trade-offs in decarbonisation pathways, and the broader dynamics of energy transition in rural and regional contexts. Led by Professor John Rolfe (CQU), Dr Jeremy De Valck (CQU), Professor Allan Dale (JCU), and Professor Hurriyet Babacan (JCU/CQU), this research underscores the critical role of regional voices in shaping Australia's net zero journey.



ENERGY, ENGINEERING, SUSTAINABILITY, AND RESOURCES

The rise of renewable energy is transforming development, and Charles Darwin University's (CDU) Energy and Resources Institute (ERI) is at the forefront of this change. With a team of leading experts in sustainable solar technology and applied energy, ERI is focused on providing energy security to regional and remote communities across Australia.

At ERI, we believe small-scale renewable technologies offer regional and remote areas greater energy independence. To support this vision, we established REMHART – the Renewable Energy Systems Hub for Applied Research and Training. REMHART is a microgrid that simulates various grid conditions, allowing us to test innovative technologies and train the workforce in a controlled environment. This facility plays a crucial role in developing new renewable energy projects.

One key initiative is the Alice Springs Future Grid, a Desert Knowledge Australia project aimed at increasing renewable energy penetration into the Alice Springs grid. ERI's grid testing facility supports the project by enabling researchers to test solutions that enhance grid efficiency and sustainability.

CQUNIVERSITY LAUNCHES MINI SUPERHYBRID TECHNOLOGY INITIATIVE

CQUniversity has partnered with Sunshine Hydro to develop a Mini Superhybrid™ aimed at advancing decarbonisation efforts in Central Queensland and creating a global testbed for long-duration energy storage and renewable energy.

The Mini Superhybrid™ is a software model that simulates a renewable energy ecosystem, including pumped hydro, electrolyzers, and wind and solar power. This testbed will help develop real-world Superhybrid™ systems, tracking power into the grid and more.

The partnership will also enhance regional training in energy technologies, including flow batteries, electrolyzers, hydrogen production, and methanol facilities. This initiative offers significant job creation potential and supports the development of Gladstone as a sustainable green fuels hub.

Through the collaboration, CQUniversity and Sunshine Hydro will co-fund two research higher degree scholarships, fostering global research and education in renewable energy. CEO of Sunshine Hydro, Rick McElhinney, emphasised that the project will inform the future of long-duration storage and accelerate green fuel hub development in Australia.



Gladstone Mayor Matt Burnett, CQUniversity Vice-Chancellor and President Professor Nick Klomp, Sunshine Hydro Head of Projects Dan Raymond and Sunshine Hydro CEO Rick McElhinney.



Image Credit: Stralis Aircraft and CQUniversity Hydrogen-electric Aircraft.



RESEARCH TO SUPPORT HYDROGEN-ELECTRIC AIRCRAFT DEVELOPMENT

Stralis Aircraft and CQUniversity have partnered to develop a hydrogen-electric propulsion system for aviation, aimed at decarbonising the industry.

The project, supported by the Regional University Industry Collaboration (RUIC) Program, focuses on designing a heat management system for a high-temperature proton-exchange membrane fuel cell (HT-PEMFC) to accelerate integration into Stralis' hydrogen-powered aircraft.

Stralis, with support from the Queensland Government and CSIRO, will use the findings to enhance their test capability and build a hydrogen-electric propulsion system for a Bonanza A36 aircraft, planned for testing in late 2025. The ultimate goal is to fly a hydrogen-powered aircraft from Gladstone to Brisbane to demonstrate aviation decarbonisation.

CQUniversity's Centre for Hydrogen and Renewable Energy is contributing expertise to the project. Dr Michael Opolot and Professor Jonathon Love emphasised the importance of industry-academia collaboration in advancing hydrogen technology. The collaboration is also part of the Hydrogen Flight Alliance, working toward Australia's first commercial emissions-free hydrogen flight.

POPULATION, DEMOGRAPHY AND WORKFORCE IN THE NORTH

STUDY HIGHLIGHTS NEED FOR
CLEARER CAREER PATHWAYS
FOR FIRST NATIONS TEACHERS

Image Credit: Charles Darwin University.

Charles Darwin University (CDU) researcher Dr. Tracy Woodroffe has found a need for clearer communication and pathways into teaching to address the shortage of First Nations teachers in the Northern Territory, which has the highest percentage of First Nations students in Australia.

Dr. Woodroffe, a proud Warumungu Luritja woman, emphasises the gap in teacher representation, with non-First Nations teachers often facing cultural and language barriers in remote communities.

Her research focuses on understanding existing pathways for First Nations students to enter teaching, but she found that these pathways are not clearly articulated or widely known. Dr. Woodroffe calls for a coordinated approach to improve these pathways and support First Nations students.

The next phase of her project, supported by a First Nations Fellowship from the Australian Centre for Student Equity and Success (ACSES), will explore the aspirations of First Nations high school students and teachers' perspectives on teaching as a career. This research aims to help the Department of Education and universities boost First Nations teacher enrolments and improve educational outcomes for First Nations students.

SUSTAINABLE AND INCLUSIVE DEVELOPMENT PIPELINE

At the Developing Northern Australia Conference in Karratha, Professor Allan Dale, CRCNA Chief Scientist, presented the *Northern Australia Development Synthesis Report*, offering a roadmap for sustainable development in the North.

The report outlines key strengths and weaknesses in current policies and programs, with 27 recommendations aimed at creating a sustainable investment pipeline.

Key findings include:

- ▶ **Research and Development:** The report emphasises the importance of continued investment in foundational research, particularly in emerging sectors like tourism, energy, and decarbonisation, citing successes of programs like the CRCNA and NESP Hubs.
- ▶ **Finance and Investment:** The establishment of concessional loans, such as the Northern Australia Infrastructure Facility (NAIF), is a strength in supporting investment.

- ▶ **Public Sector Investment:** Collaborative federal and state investments in infrastructure projects like Beef Roads and Roads of Strategic Importance have been vital.
- ▶ **Aboriginal and Torres Strait Islander Participation:** The report calls for stronger support for First Nations communities, focusing on local governance, planning, and economic development.
- ▶ **Place-Based Partnerships:** Building partnerships to overcome investment barriers is essential for turning ideas into projects.
- ▶ **Land Use and Infrastructure Planning:** The report stresses the need for cohesive regional planning to attract investment and protect communities and the environment.

CRCNA Chair Sheriden Morris and NESP co-Hub leader Professor Damien Burrows highlighted the importance of foundational research and collaborative partnerships for Northern Australia's sustainable development.

The report coincides with the release of the Australian Government's *Northern Australia Action Plan 2024-2029*, which outlines the government's priorities and the opportunities and challenges ahead.



Developing Northern Australia Conference 2024 Karratha, Western Australia. Photography Courtesy: J McHugh.



Image Credit: James Cook University.

LIVEABILITY, MIGRATION AND WORKFORCE


James Cook University and CQUniversity have joined forces to establish collaborative research clusters focused on liveability, migration and the regional workforce across Northern Australia. Bringing together approximately 30 researchers, the initiative is led by Professor Hurriyet Babacan and eight theme leads spanning both Institutions.

The clusters explore a wide range of interconnected themes critical to the future of regional Australia, including internal and international migration, labour mobility, housing, place-based planning, and workforce transitions. Their research also addresses the impacts of climate change, population ageing, sector-specific workforce needs, and the growing influence of digital technologies.



Image Credit: James Cook University: International Women's Day, JCU Ideas Lab. Photography Courtesy: J McHugh.

These efforts have already led to several collaborative research proposals, including projects focused on aged care workforce strategies, supply chain labour needs, and green jobs in the ASEAN region. Together, JCU and CQUniversity are building a robust evidence base to inform policy and planning for sustainable regional futures.

A group of people are relaxing on a sandy beach under the shade of several tall palm trees. In the foreground, a man sits on the sand holding a guitar, while a woman sits next to him. To their right, a man and a woman are sitting in a blue hammock strung between two palm trees. Another man stands nearby, gesturing with his hands. In the background, a woman stands near the water's edge, and another man is visible further back. The ocean is a vibrant blue, and distant mountains are visible on the horizon under a clear sky.

Bringing together approximately 30 researchers, the initiative is led by Professor Hurriyet Babacan and eight theme leads spanning both James Cook University and CQUniversity.

Photography Courtesy: James Cook University.

ARTS AND CULTURE IN THE NORTH

LABNORTH: SHAPING THE FUTURE OF ARTS AND CULTURE IN NORTHERN AUSTRALIA

LabNorth, led by Associate Professor Lisa Law from James Cook University (JCU), is a new research initiative, set to elevate the role of arts and culture in Northern Australia.

Building on years of collaboration with Cairns Regional Council, the project expands on the State of the Arts in Cairns (SoARTS) reports to include a broader focus on the importance of cultural planning to social and economic wellbeing in the region. With support from JCU's Roderick Centre for Australian Literature and Creative Writing, LabNorth also includes Associate Professor Victoria Kuttainen from JCU Townsville, Associate Professor Tully Barnett from Flinders University and Associate Professor Adelle Sefton-Rowson from Charles Darwin University.

Despite Northern Australia's reputation for mining, military, and agriculture, the rich cultural landscapes of Darwin, Cairns and Townsville are underrepresented in regional development policy despite their importance to day-to-day living. LabNorth seeks to challenge this imbalance by highlighting the crucial value of arts and culture to the vitality of small northern cities. Through policy analysis,



community engagement, and storytelling, the initiative works to reshape perceptions and advocate for arts and culture as critical infrastructure for regional futures.

LabNorth's mission is to weave a tapestry of connections across cities, sectors, and artforms—championing the transformative power of arts and culture as a cornerstone of social and economic vitality in Northern Australia.

By listening to local voices and co-creating stories, LabNorth is not only documenting the urban cultural landscapes of Northern Australia—it is actively shaping a more inclusive, resilient, and future-ready regional arts ecosystem.

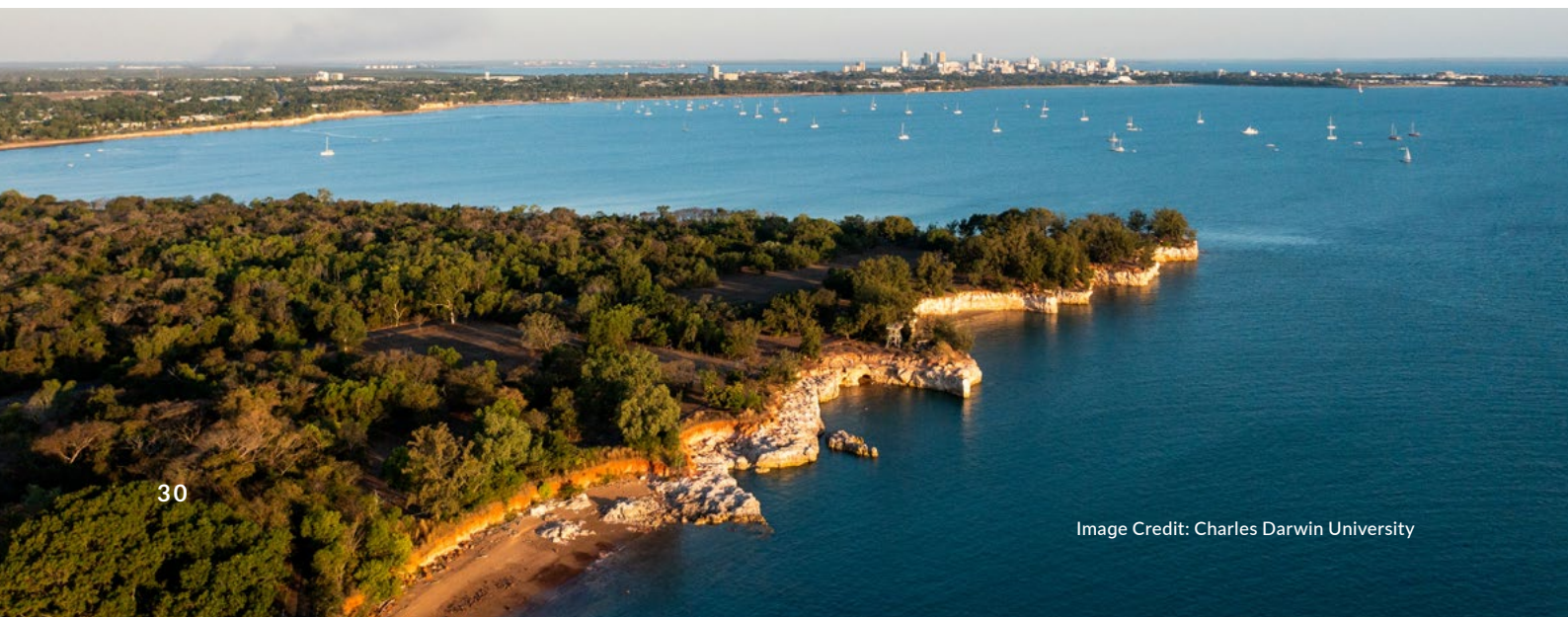




Image Credit: CQUniversity.

SAVANNAH WAY ART TRAIL BRINGS NEW LIFE TO NORTH QUEENSLAND COMMUNITIES

The Savannah Way Art Trail, a new drive-tourism initiative in Queensland's North, features six large-scale contemporary sculptures installed across Burketown, Croydon, Normanton, Georgetown, Karumba, and Doomadgee.

Created by artists Glen Manning and Kathy Daly, these abstract sculptures tell unique stories relevant to each town, drawing from local culture and First Nations traditions.

Each sculpture, developed in consultation with local communities, highlights key elements of the region's identity. For example, Georgetown's sculpture represents the town's floral emblem, the kapok, while Karumba's features two dancing brolgas, celebrating the area's birdlife. Doomadgee's sculpture honours the Dirriwaldi fish, significant to the local community, and Croydon's piece reflects the area's rich history.



Image Credit: CQUniversity.

Normanton's sculpture draws inspiration from the petals of the Carpentaria Waterlily and the Magpie Geese, while Burketown's art honours the role of First Nations Rangers and the freshwater turtle.

The project managed by Patty Preece from CQUniversity also involved collaboration with First Nations artists, ensuring the inclusion of local Indigenous perspectives. Queensland Minister for the Arts, Leeanne Enoch, highlighted the art trail's potential to boost cultural tourism and local employment. Supported by the Queensland Government through various funding initiatives, the Savannah Way Art Trail is set to enhance regional arts and celebrate the area's rich cultural heritage.

STRENGTHENING NORTHERN AUSTRALIA'S CONNECTIONS WITH THE INDO-PACIFIC

Northern Australia's geographic proximity to the Indo-Pacific region positions it as a key player in advancing strategic, economic, and cultural ties.

With growing recognition of the need for deeper, more relational engagement, Northern Australia is increasingly focusing on building long-term partnerships grounded in shared challenges and mutual interests.

From climate change to circular economy, regional development to global trade, a series of collaborative initiatives is strengthening these ties. A key example is the partnership between the Northern Australia Universities Alliance (NAUA) and the Department of Foreign Affairs and Trade, delivering a professional development program in Cairns for Australia Awards Fellows. Centred on regional cooperation, this initiative supports knowledge exchange and leadership development for emerging Indo-Pacific leaders.

Broader regional collaborations include engagement with the Northern Regional Development Australia Alliance on East-West connectivity, and emerging partnerships with Indonesia's National Research and Innovation Agency focused on digital connectivity and circular economy innovation.

In addition, James Cook University and CQUniversity are working closely on projects addressing global supply chain optimisation, inclusive development, and workforce transitions, with a strong emphasis on sustainable economic models. Collaborating on funding bids to explore ASEAN green jobs, circular economy strategies, and rural climate change resilience.

Together, these initiatives reflect a growing commitment to fostering resilient, equitable and future-facing partnerships between Northern Australia and the Indo-Pacific region.



A market in Malinau-East Kalimantan-Indonesia.
Image Credit: Intu Boedihartono.

COMBATING MOSQUITO-BORNE DISEASE IN THE PACIFIC

The Pacific Mosquito Surveillance Strengthening for Impact (PacMOSSI) Consortium, led by JCU supports Pacific Island countries to combat mosquito-borne diseases and improve community health and well-being through strengthened mosquito surveillance and control.

The consortium develops and delivers online training, hands-on workshops, technical guidance, supplies and equipment for local communities to empower them to undertake situation reviews, data management, strategic planning, operational research and citizen science.

NAUA AT A GLANCE



GROWING THE NORTHERN WORKFORCE

79,912

students preparing for regional industries.

DELIVERING SOLUTIONS FOR THE NORTH

\$164M

in research funding tackling real-world challenges.



SUPPORTING INDIGENOUS LEADERSHIP

2,492

university students.

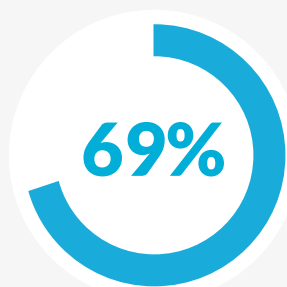
5,176

VET students driving change.

REGIONAL AND REMOTE SHARE

NAUA universities play a critical role in educating regional and remote Australians.

Department of Education, 2022 Higher Education Statistics, Domestic Student Data, Table 11.5.



NAUA
Universities



National
Average

LOOKING AHEAD: WORKING TOGETHER FOR NORTHERN AUSTRALIA'S FUTURE

Northern Australia is not just a region of opportunity — it is a region of responsibility. Its future matters to all Australians.

Realising its potential demands place-based approaches, enduring partnerships, and a long-term commitment to equity, research, and Indigenous leadership.

From water and agriculture to health, education, energy, and culture, the stories in this publication reflect the breadth and impact of research-led initiatives shaping a more inclusive, sustainable, and prosperous North.

The Northern Australia Universities Alliance (NAUA) is committed to working with government, industry, and communities to co-design and deliver the next generation of policies, programs, and solutions tailored to the North's unique conditions.

Northern Australia's success is Australia's success.
Let's work together to realise its full potential.

**NORTHERN
AUSTRALIA
UNIVERSITIES
ALLIANCE**



A SHARED VISION FOR NORTHERN AUSTRALIA





NORTHERN AUSTRALIA UNIVERSITIES ALLIANCE



Northern Australia has vast potential that stands to benefit the entire nation in economic, social, environmental and cultural terms. At the same time, it faces a range of unique and complex challenges.

The collaborative strengths of the three northern Australian Universities places NAUA in a unique position to facilitate meaningful research projects that address the challenges that face communities and industry in this region.