

# Renewal

Interactive edition

Capturing the value  
of AgTech innovation  
on-farm P18

Revolutionising  
energy storage—with  
human hair P23

Eliminating  
schistosomiasis  
from Asia P36



Charles Sturt  
University

Research  
for a world  
worth living in

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## Charles Sturt – the regional civic university

This edition of *Renewal* provides further evidence of the diversity of Charles Sturt's contribution to addressing regional environmental and socio-economic challenges highlighting our important role as a regional civic university. The pandemic heightened the significance of civic engagement with communities all over the world not just in terms of looking for ways to renew local economies but probably more importantly in addressing issues of social inequality and cohesion.

Wealth inequality in Australia has increased substantially over the past two decades with the wealth of the highest 20 per cent increasing by 82 per cent, compared with 61 per cent for the middle 20 per cent but only 20 per cent for the lowest 20 per cent of earners. Balanced social and economic development needs to be at the centre of the new social contract and Charles Sturt has a key role to play.

John Dewey's (the American moral philosopher and education reformer) formulation of the moral and civic purposes of education in *Democracy and*

*Education* (1916) can be extrapolated to the role of universities in a post-pandemic world. Dewey argued that education is needed for any culture to maintain the bonds that unite its members. Universities have a social responsibility to enable a fully formed public opinion through public value creation with community by brokering collaborative problem-solving at the local scale on the big public policy problems of our time, from AI futures to climate resilience, from poverty alleviation and social inclusion to economic regeneration and, of course, First Nations enablement closer to home.

Universities are uniquely placed to play this role given that research shows that, at a time of declining trust around the world, universities are trusted for delivering credible evidence-based content, giving voice to a plurality of perspectives and presenting an impartial interpretation of complex problems. In contrast to the United States, Australian universities are amongst our most trusted institutions. During Covid-19, the most trusted source for 'honest and objective information about



Covid-19' were scientists and experts, with eight in 10 agreeing to this statement and seven in 10 regarding universities as trusted institutions ([Evans, 2020](#)).

We are presently playing at least five roles in this regard at Charles Sturt. First, as a **champion of liberal democracy** – at a time when there are more dysfunctional and non-democracies than functional democracies in the world, Charles Sturt is enhancing democratic governance through building political literacy and fostering critical citizens. Successive royal commissions and inquiries have demonstrated strengths and fragilities in Australia's democratic institutions and practices. But should we be waiting for the next public inquiry to alert us to issues with our democratic practice? In collaboration with the [Democratic Audit of the United Kingdom](#), the London School of Economics and the Museum of Australian Democracy, in July 2024, Yindyamarra Nguluway will launch a permanent and independent Democratic Audit of Australia to provide ongoing intelligence on the strengths and weaknesses of Australia's democratic institutions. The Audit will take place in accordance with the Commonwealth election cycle. This is in keeping with the report of the Senate Inquiry into nationhood, national identity and democracy which endorsed recommendations for a permanent independent Democratic Audit of Australia and the revitalisation of civics education.

The Audit has been compiled by subject matter experts drawn from across Australia through collaborations

with universities in every state and territory. This includes the Australian National University, the University of Canberra, Charles Darwin University, Deakin University, Flinders University, Griffith University, The University of Melbourne, the University of New South Wales, University of Technology Sydney, the University of South Australia, The University of Sydney and the University of Tasmania. The Audit bridges significant gaps in the evidence base on Australia's democratic practice, enhances debate on the quality of democratic governance, provides an invaluable resource to support better civics education in Australia and is free for everyone to download.

Second, as a **defender of evidence-based practice** and producer of objective evidence. In an era of 'truth decay', universities are uniquely placed to combat 'truth decay' in our areas of expertise. 'Truth decay' is defined by the [RAND Corporation](#) as the increasing disagreement about facts and analytical interpretations of facts and data; the blurring of the line between opinion and fact; the burgeoning volume, and resulting influence, of opinion and personal experience over fact; and declining trust in formerly respected sources of factual information. Given the high level of trust citizens have for universities, it is time that we are publicly funded to provide independent, evidence-based fact checking services in our areas of expertise. At present, we deliver on this aim through our ongoing contribution to *The Conversation*. In March 2024, 161,789 people read Charles Sturt *Conversation* articles. Three of our

most read articles focused on correcting misinformation or myth busting:

[Elon Musk says ketamine can get you out of a 'negative frame of mind'. What does the research say?](#) by Julaine Allan

[Do the principles of the Treaty of Waitangi really give Māori too much power – or not enough?](#) by Dominic O'Sullivan

[Explainer: what is Ramadan and why does it require Muslims to fast?](#) by Mehmet Ozalp

However, we could be playing a much more active role in delivering public programs that build the capacity of citizens to discern and refute misinformation, disinformation and malinformation.

Third, universities also provide **safe places for civic conversations** and enable community participation on critical issues. For example, Charles Sturt's Provocations is a series of public lectures, panel discussions and blogs written by prominent thinkers that seek to address significant intellectual and social challenges to progress confronting Australia and the world. Visit the Provocations blog at: <https://provocations.csu.edu.au/>. Here you will find a series of provocations aimed at challenging orthodox thinking written by provocateurs Clive Hamilton, Sharynne McLeod, Wayne Hudson, Lee Baumgartner, Ganna Pogrebna and Patrick Walsh. On each topic we encourage reasoned online engagement and debate.

We have also established a Local Government Policy Lab with the Central NSW Joint Organisation of

Local Governments which includes 14 councils drawn from across Charles Sturt's footprint. The Policy Lab brings together council officers, politicians and university experts to work on specific policy or service problems. The Lab uses a combination of co-design and action learning methods to generate potential solutions to issues such as social media management, water governance and affordable housing.

Fourth, universities can also be **brokers of place-based social inclusion interventions** of various kinds to help integrate marginalised groups into the community and give voice to their current needs and aspirations for the future. Here, universities can broker community-based partnerships to actively remove sources of disadvantage through, for example, 'place-based' community wellbeing programs in areas such as mental health and cultural safety. We have a large number of such programs underway. For example, we have just established a long-term partnership with the Enterprise and Training Company to provide research and innovation services to support long-term unemployed citizens into stable employment in the northern coastal region of NSW and we are supporting the Wiradjuri Council of Elders on various nation building activities to enhance their leadership role in community governance across the Wiradjuri nation.

Moving forward, perhaps Charles Sturt's most valuable contribution to the Australian Universities Accord will be in developing research and education

programs aimed at widening the social and economic participation of vulnerable groups through better access to regional education and healthcare.

Finally, as **brokers of economic development**, many universities around the world play a key role either as facilitators or as partners in collaborative partnership networks designed to address specific economic or social problems. Various called (health or education) action zones, growth centres or coalitions, urban regimes, city academies or city deals; as trusted intermediaries universities can and should make a difference in local-regional problem-solving. Universities are often one of the largest local employers and key players in the local commercial and residential development landscape, playing a fundamental role in building local infrastructure and the social license to operate that is critical to sustainable local economic growth.

We are currently building the Gulbali AgriPark on Charles Sturt's Wagga Wagga campus with government, industry and community partners, modelled on Food Valley at Wageningen University in the Netherlands and devoted to supporting the development of the digital and circular economy across NSW. The Gulbali AgriPark has been designed with disruption in mind. Traditional barriers to commercialisation are being removed and networks of large, small and medium-sized businesses are being carefully curated around the problem-solving needs of our partners and our research capability in circular and digital agriculture. We add

value to the work of our partners through the provision of world class research capability, facilities and big industry relationships, expanding their reach into value-adding production processes and new geographies of producers and researchers both nationally and globally. This unique access to a cohesive ecosystem of innovative producers provides a creative space for matching research capability with industry needs, identifying commercialisation pathways and accelerating product and service innovation.

This systems approach to planned sectoral growth will contribute to the advancement of industry innovation, contribute to Australia's post-Covid-19 economic recovery and strengthen the food security pipeline shamelessly exposed during the pandemic.

These five roles are particularly important in a post-Covid world in which community trust building is in a state of renewal and community cohesion is at risk. For Charles Sturt to play these roles successfully we require clarity of vision and strategy, a clear understanding of place (for us, this is mainly the geography of urban-regional corridors), and capability in co-design and delivery with community partners. But most importantly, we require a whole of university engagement with the public good and the creation of public value.

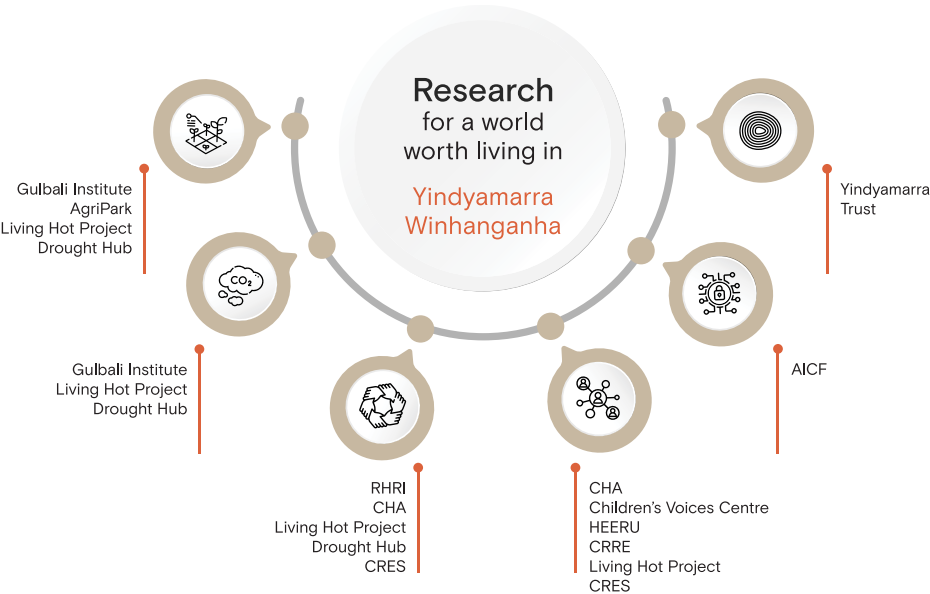
Enjoy the edition!

Mark Evans  
Deputy Vice-Chancellor (Research)

# Finding regional solutions to regional problems with global reach and impact

Research is, and will always be, vital to what we do at Charles Sturt. We aim to be the leading regional university known for solving real-world challenges in our targeted strategic investment areas by bringing together Western knowledge

and Indigenous wisdom. Through strong and enduring partnerships with industry, government, local communities, and international networks, we will meet the research needs of our communities.



RHRI: Rural Health Research Institute  
 CHA: Centre for Health Access  
 Children's Voices Centre  
 HEERU: Higher Education Equity Research Unit  
 CRRE: Centre for Regional and Rural Education  
 AICF: Artificial Intelligence and Cyber Futures Institute  
 CRES: Centre for Religion, Ethics & Society



### **Prosperous, circular and digital regional economies**

Research that enables sustainable production through AI driven precision and circular farming



### **Climate neutral, bio-secure and diverse regional ecosystems**

Research that reduces carbon emissions through renewable energy production, the use of biomass and natural capital and nurtures the ecology of freshwater, terrestrial and marine ecosystems



### **Healthy, safe and well regional communities**

Research that builds safe and secure communities, reduces health inequality and promotes wellbeing



### **Educated, adaptive and inclusive regional communities**

Research that builds community capability and reduces barriers to social, economic and political participation



### **Cyber secure, innovative and connected regional communities**

Linkage research across all domains that build innovative and digitally connected communities free from the risk of cyber attack



### **Yindyamarra Trust**

Understanding country and where you are. Caring and stewardship for country and being good ancestors

# Charles Sturt continues to be a global leader in climate action, gender equality and sustainability

Charles Sturt continues to deliver strong outcomes in the *Times Higher Education* (THE) Impact Rankings, reflecting our commitment to sustainability and all its facets in our university strategy.

THE's Impact Rankings are the only global university rankings that measure progress towards the United Nation's 17 Sustainable Development Goals. They evaluate our university programs and initiatives, including research, teaching and learning, partnerships and engagement, and facilities and operations.

Charles Sturt achieved impressive results within individual SDGs, including ranking:

- In the top two per cent for Gender Equality
- In the top five per cent for Climate Action
- In the top five per cent for Partnerships for the Goals
- In the top 10 per cent for Life on Land

These results are particularly pleasing given that an additional 500 universities participated in the 2024 THE impact rankings.



Top 5% in the world for climate action

Times Higher Education Impact Ranking 2024



Top 2% in the world for gender equality

Times Higher Education Impact Ranking 2024



Top 10% in the world for life on land

Times Higher Education Impact Ranking 2024



Top 5% in the world for partnerships for the goals

Times Higher Education Impact Ranking 2024



We're excited to announce the launch of a new dedicated LinkedIn page for Charles Sturt Research!

Follow us at #Charles Sturt for the latest stories in our research journey.



**Follow us**  
**For research that matters**

A promotional banner for the Charles Sturt Research LinkedIn page. The banner features a photograph of a person wearing a wide-brimmed hat and a bright orange jacket, sitting on a wooden log on a rocky outcrop overlooking a vast, hazy landscape of rolling hills and valleys. The banner includes the Charles Sturt University Research logo (a blue square with a white crest and the text 'Charles Sturt University' and 'Research') and the LinkedIn logo (a white square with a black 'in' symbol). The text 'Follow us' and 'For research that matters' is displayed in white, bold font.

# Cyber secure, innovative and connected regional communities

Charles Sturt researchers are discovering new ways to keep our regional communities safe and secure.



## Global grant from PepsiCo and AgMission secured to fast-track climate-smart agriculture

Charles Sturt University's Cool Soil Initiative has secured close to AU\$2.1 million to spearhead research into sustainable agriculture and expand the initiative into new regions and commodities.

PepsiCo and AgMission, a global initiative co-founded by the Foundation for Food & Agriculture Research (FFAR) and the World Farmers' Organisation (WFO), have partnered to unlock agriculture's potential to reduce greenhouse gas (GHG) emissions, awarding three grants to researchers in Australia, Mexico and Canada.

The total combined investment of US\$6.7 million will support evidence-based research on the effectiveness of







climate-smart agriculture practices that incorporate regenerative agriculture principles.

A grant of US\$748,394 was awarded to Charles Sturt by AgMission, generously matched by PepsiCo and supplemented by the University. The total investment of US\$3,783,598 is set to significantly benefit Australia's grain industry through enacting climate-smart agricultural practices.

The research initiative builds upon the foundation laid by the Cool Soil Initiative since its inception in 2018, collaborating with farmers to reduce GHG emissions and improve soil health through a scientifically credible and globally recognised framework.

AgriSciences Research and Business Park (AgriPark) Executive Director, Nick Pagett, said the research was indicative of Charles Sturt's commitment to driving innovation in agriculture.

"It's not just about driving innovation, but also demonstrates our value in working with partners to find solutions to the challenges posed by climate change," Mr Pagett said.

*"It's a great honour to be one of only three recipients of this global grant and to have the opportunity to provide the Australian cropping sector with new insights into climate-smart practices. It's great to see companies like PepsiCo, one of the six partners of the Cool Soil Initiative, looking for opportunities like AgMission to support climate-smart agriculture in Australia and around the world."*

PepsiCo ANZ Sustainability Manager Brent Gapes said the partnership and

grant would deliver meaningful results for farming on a global scale.

“As one of Australia’s largest snack manufacturers we are committed to ensuring the development and implementation of Australia’s sustainable farming practices,” he said. “Our partnership with AgMission is helping us to further charter a new course to drive positive action for the planet and people, building a circular and inclusive value chain. We’ve seen the benefit of the Cool Soil Initiative first-hand in the past twelve months and we’re delighted to be able to further support the transformative work of Charles Sturt University within this space.”

In 2023, PepsiCo helped to extend the reach of the Cool Soil Initiative, bringing canola to the GHG reduction program for the first time. The partnership enabled PepsiCo to contribute to supporting farmers in future-proofing their farming systems, while ensuring PepsiCo can continue to source canola from Cool Soil regions into the future.

The new grant will enable Charles Sturt researchers to leverage the learnings and insights from the Cool Soil Initiative’s five years’ worth of on-ground support and GHG reporting across wheat, canola and corn farms on the east coast of Australia, while establishing a new farmer cohort for oats in Western Australia.

Researchers are evaluating more than 300 Australian farms to understand how different agricultural practices and geographic locations influence soil health, to understand current climate-smart agriculture innovation for each major Australian cropping system.

Cool Soil Initiative Director, Fiona McCredie, said the funding provided a tremendous opportunity to expand understanding of climate-smart agricultural practices across different regions in Australia.

“In having this understanding, we can then work with farmers to build resilience as they navigate climate-related challenges,” she said. “The Cool Soil Initiative is all



about sustainable production and making a difference on the ground by translating science and insights into practical actions which support sustainable food production and have those practices recognised by the supply chain.”

This funding is part of a broader AU\$10 million investment to expand the Cool Soils Initiative, providing science-backed solutions to improve soil health, reduce GHG emissions and support sustainable farming practices.

The initiative is crucial for enhancing environmental sustainability and providing valuable Scope 3 GHG and

impact reporting through the supply chain to the food industry.

Nick Pagett added that the investment marks a significant step towards realising their vision of a more sustainable, innovative and resilient agricultural industry.

“By collaborating with industry partners and leveraging cutting-edge research and technology, we are poised to address pressing challenges and unlock new opportunities for growth and development,” he said.



Listen to Nick Pagett, Executive Director, AgriPark, discuss the development of Charles Sturt’s AgriPark, which is modelled on international best practices and committed to circular and digital agriculture.

# ARC Linkage Grant on UAV's for Defence

AI and Cyber Futures Institute Senior Research Fellow and Program Lead of Defence and Cybersecurity, Dr Fendy Santoso, has successfully secured federal government funding to enhance the resilience of cybersecurity measures for unmanned aerial vehicle (UAV) systems. The research project aims to explore resilient cybersecurity measures for UAV systems to safeguard them against adversarial machine learning attacks.

Dr Santoso will be responsible for implementing and evaluating countermeasures to implement the defence mechanisms developed and integrate them with real-world UAV systems using datasets provided by the partner organisations. UAVs play a pivotal role across national industry sectors in logistics, environmental monitoring, smart farming, bushfire and disaster management, and more.

The susceptibility of machine learning models on UAV systems to adversarial attacks poses a significant barrier to their widespread adoption. The project seeks to advance the understanding of cybersecurity by employing innovative approaches to fortify UAV systems against vulnerabilities in machine learning models. This research aligns with the Australian Government's strategy to promote

and protect critical and emerging technologies, strengthening Australia's global position.

"By collaborating with industry partners and leveraging cutting-edge research and technology, we are poised to address pressing challenges and unlock new opportunities for growth and development," he said.

This research aligns with the Australian Government's strategy to promote and protect critical and emerging technologies, strengthening Australia's global position. The project commenced in 2024.







# Prosperous circular and digital regional economies

Charles Sturt researchers are making new discoveries to generate profitable and sustainable agricultural production.



## Capturing the value of AgTech innovation on-farm

The long-term benefits of adopting AgTech on the farm are well known. Technology can significantly increase productivity, profitability, and sustainability, but despite these benefits, AgTech adoption in Australian agriculture remains low.

Many Australian producers describe new technology as challenging to navigate and worry about making unwise investments without a guarantee of return.

At the Southern NSW Innovation Hub, based at Charles Sturt University's Wagga Wagga campus, with regional stakeholders Meat & Livestock Australia (MLA), industry partners, and KPMG, Charles Sturt is working with producers to facilitate AgTech adoption by clarifying its costs and benefits and showing how digital tools could improve on-farm decision-making.





## The AgTech ROI calculator

The ROI calculator will allow producers to see the costs and benefits of AgTech as it applies to their operation—either by entering their farm data or using calculations built into an online platform.

### *About the project*


The Capturing value of AgTech innovation on-farm projects sets out to address one of the barriers to AgTech adoption by developing a tool producers could use to see the costs and benefits of AgTech as it applies to their operation—either by entering their farm data or by using calculations built into an online platform.

The goal is to create an easy-to-use online AgTech ROI calculator for producers. This tool will estimate the net benefit (or cost) of potential AgTech solutions if adopted on their farm. It will be a lasting asset for Southern NSW and potentially transform other industries and regions.

## Project partners

The Southern NSW Innovation Hub's Agricultural Innovation Hubs Program is a joint initiative with the Department of Agriculture, Fisheries, and Forestry. This project is a collaboration between the Hub, Meat and Livestock Australia (MLA), the New South Wales Department of Primary Industries (NSW DPI), Charles Sturt University, beef producers, Farming Systems Group Alliance (FSGA), and Local Land Services (LLS), with development from KPMG. It is a testament to the power of collaboration, bringing together key industry stakeholders and producers to test and refine existing MLA technology.





## AICF and AgriPark win a major next-generation program grant

In a groundbreaking collaboration, the AI and Cyber Futures Institute (AICF), in partnership with AgriPark, has been awarded a AU\$1.59 million grant from CSIRO and the Australian Government for the project, “AgriTwins: Bridging Cyber- secure Emerging Technologies and Data-centric Twin Tech for Resilient Agriculture of the Future”.

This project represents a significant stride in harnessing the power of AI, machine learning, and cybersecurity to transform the agricultural sector in the Asia-Pacific region and globally. The AgriTwins initiative aims to integrate cutting-edge technologies, such as digital twins and quantum twins, focusing on critical areas like disease prediction in viticulture, carbon emission modelling, and crop management. This integration is expected to provide a sustainable competitive advantage in global markets. Moreover, the project strongly emphasises regional development, aiming to cultivate research pipelines outside major cities to tap into local talent and invigorate regional business models.

The success of this ambitious project is a testament to the power of collaboration. The AICF team and nine industry partners have worked tirelessly to bring this vision to life.

The Executive Director of the AICF, Professor Ganna Pogrebna, said the Institute is proud to have led the AgriTwins project.

*“This initiative, in collaboration with Gulbali AgriPark and other esteemed stakeholders, represents a jointly funded \$1.59 million investment by CSIRO, industry, and partner universities to take a significant leap in the use of emerging technology in the agricultural sector.”*





Photo: Nick Pagett (Executive Director AgriPark), Professor Ganna Pogrebna (Executive Director, AICF), Jonathan Medway (Head of Digital and Sustainable Agriculture), Dr Jian Liu (AICF, AgriTwins Project Lead)

Executive Director of the Charles Sturt Gulbali Agripark Nick Pagett, said the program has forged partnerships with Australian industry leaders in AgriTech through the Gulbali AgriPark initiative, bridging the gap between theoretical research and practical agricultural challenges.

“This project is paving the way for a revolution in sustainable and technologically advanced agriculture in Australia,” Nick Pagett said. “This initiative is not just about research; it’s a commitment to shaping the future of our industry, ensuring a cyber-secure and digitally integrated landscape. Together, we are cultivating a competitive edge for Australia in global markets.”

The benefits of AgriTwins extend from the diverse expertise of its researchers, ranging from cybersecurity specialists to agricultural technology experts.

AgriTwins will use emerging technologies across various applications, including viticulture disease prediction, carbon emission modelling, and advanced crop management.



## AICF opens a regional AI lab in Bathurst

AICF has recently unveiled its Regional Demonstrator Lab in Bathurst, marking a significant milestone in pursuing pioneering research and innovation in artificial intelligence and cybersecurity. This new facility aims to foster research in regional development using emerging technology. As you enter the lab, you are greeted by the Robotics Area, a veritable playground for researchers and enthusiasts. Here, advanced robots like Uni Tree Dog, Uni Tree Z1 Manipulatom and Turtlebot stand ready, promising endless possibilities for exploration and discovery in robotics. Adjacent to this is the Aerial and Underwater space, where the YuNEEC Hexacopter and QYSEA Fifish V6 Plus drone reign supreme. Paired with the Flight Precision Console, this area is a testament to AICF's commitment to pushing the boundaries of aerial and aquatic exploration. It offers a glimpse into uncrewed vehicles' future and potential applications.

The lab also boasts a Computer Vision and Analytics Area with specialised workstations and powerful Matlab software. This space is dedicated to computer vision and image analysis tasks, essential components in developing intelligent systems to interpret and understand the visual world. This area exemplifies the integration of virtual and physical worlds, providing valuable insights into complex systems and processes. Despite its infancy, the lab has welcomed esteemed guests, including Senator Perrin Davey and representatives from Invest NSW, Regional NSW, and Bathurst Regional Council. The lab is meant to be a hub of innovation and collaboration, poised to revolutionise how we approach emerging technology research and development.



## Human hair transformed into renewable energy storage

Research Fellow at the Rural Health and Research Institute Dr Amandeep Singh Pannu, working with Professor Muhammad J A Shiddiky, has discovered how to turn human hair into graphite for lithium-ion batteries.

“There is an ever-rising demand for more energy production, and countries are trying to switch to renewable sources,” Dr Singh said. “However, to make that switch, one needs sustainable ways to store such energy; hence, there is an urgent need to sustainably manufacture high-energy density storage materials. Graphite is a key material used as a negative terminal for lithium-ion batteries, and its production is concentrated in a few countries, causing the material to suffer from supply chain and geo-political issues which affect the whole energy storage industry downstream.”

Dr Singh added that producing graphite sustainably from waste on demand and locally in Australia will hugely benefit

our national energy sector. Additionally, as the demand for electric and hybrid vehicles increases, the need for lithium-ion batteries follows. However, Dr Singh said that producing graphite in these batteries can pollute and requires harsh chemicals, such as hydrofluoric acid (HF).

“One eco-friendly, carbon-rich source that is abundant and readily available everywhere is human hair,” he said.

“It’s an incredibly clean source throughout the process, with minimal pollutants or negative outputs.”

Sustainable Salons, a for-purpose organisation dedicated to diverting salon waste from landfills, collects hair clippings from salons and pet groomers across Australia and New Zealand.

Since 2020, Sustainable Salons Co-Founder, Paul Frasca, has been supplying hair clippings for Dr Singh to conduct his research.

“We envision a future where hair transcends its conventional status as waste and emerges as a sustainable resource of immense potential,” Paul Frasca said.

“What sets hair apart is that it is an infinite resource—hair is constantly growing!”

“The prospect of harnessing hair to power our electric vehicles demonstrates that a sustainable future is limitless when we embrace the circular economy.”

Using human hair as sustainable energy has already been proven effective in

Dr Singh’s prior research, where it was transformed into hair-derived carbon dots.

“We have essentially been able to fabricate flexible light-emitting diodes (LEDs), which are used in so many technological products today, but instead of heavy metals, the active material is ingeniously derived from discarded strands of human hair,” he said.

“This could revolutionise how we achieve emission reduction goals in the future.”



For Dr Amandeep Singh Pannu, scientific research is all about making eco-friendly, useable materials from what is normally considered waste. This is why his latest project centres on turning human hair into sustainable graphite for batteries to store renewable energy. Hear about a groundbreaking idea that could revolutionise how we achieve emission reduction goals.



The Premier of NSW, the Hon. Chris Minns MP, on a tour of our beautiful Charles Sturt University Orange campus. The Premier met dentistry and medical students and was shown our world-class dentistry simulation and anatomy lab.

He also met Dr Amandeep Singh Pannu, who demonstrated his incredible research in turning human hair into graphite to power lithiumion batteries.





# Climate-neutral and biodiverse regional ecosystems

Our research here aims to reduce carbon emissions by using new technologies that allow us to test and forecast the effectiveness of different methods for both affecting pollution control and living hot—that is, thriving and surviving on a warming planet.



## FishTech: Gaining win-win outcomes for fisheries and irrigation

**Objective:** To facilitate greater adoption of fish passage technologies in the Mekong subregion and Indonesia.

**Lead countries/organisation(s):** Led by Charles Sturt University, Department of Foreign Affairs and Trade (DFAT), and Australian Centre for International Agricultural Research (ACIAR).

**Places:** Lao PDR, Cambodia, Thailand, and Indonesia

### Background and objectives

The world's most productive inland fishery the Lower Mekong Basin (LMB) fishery, is at a critical juncture, threatened by the widespread development of river infrastructure to meet the region's growing demand for irrigation and hydropower generation. In partnership with ACIAR and DFAT, our research aims to urgently address this





issue by facilitating the development of fish passage technologies (known as 'fish passes') throughout the LMB countries. These technologies mitigate the barrier impacts of river developments and conserve the basin's fishery for future generations.

Fish pass technologies restore habitat connectivity by providing 'ladders' for fish to swim around dams and other barriers. The FishTech project builds upon a program of work that progressed from a proof of concept into a more comprehensive research and implementation phase, which has shown that fish passes can ameliorate river development's effects and have lasting social and economic benefits. This research has the potential to bring about significant positive changes. Specifically, it seeks to facilitate greater adoption of fish pass technologies in Asian countries (notably the Mekong subregion and Indonesia) by upscaling and scaling out fish pass implementation efforts.

## Actions

FishTech is working to enhance fisheries productivity and biodiversity by integrating irrigation development with appropriate fish pass technologies, proven through applied research in the Mekong subregion and Indonesia, with further outreach to Southeast Asia. It is doing this via a three-pillared approach:

### *Pillar 1: Fish pass design research and on-ground implementation*

Targeted research is being undertaken to address key knowledge gaps regarding fish pass science in the LMB and demonstrate proof of concept in each country. In addition, on-ground fish pass implementation activities are being upscaled and scaled out using co-design processes with in-country partners and by integrating into development bank investments wherever possible. These fish pass demonstration sites are being used to show that social, environmental and economic benefits can accrue from appropriately executed fish pass solutions.

## *Pillar 2: Capacity-building research and development*

A motivations and abilities analysis (MOTA) study is being undertaken to understand the needs of government stakeholders and investors to incorporate fish passage technologies in river developments. In addition, focused masterclasses are being run to fill gaps in institutional capacity and prioritise and co-design fish passes in each country. Furthermore, a graduate certificate in fisheries management has been developed and run at Charles Sturt University to provide skills and international qualifications. FishTech is evaluating the effectiveness of the project capacity-building activities, both in the short term through Menti surveys and over the long term by undertaking Tracer surveys of previously trained staff.

## *Pillar 3: Governance and policy research and development*

A systematic review of fish passage policy and legislation has been undertaken for Lao PDR and Cambodia, and a governance decision support framework has been developed for adopting fish pass technologies in those countries.

## **Results**

The project is expected to generate various social, environmental and economic benefits in the LMB and Indonesia.

**Social:** The increased adoption of fish pass technologies into river developments will maintain food security and support livelihoods for villagers upstream of the fish pass implementation

sites by restoring fisheries productivity. We have not yet analysed any fisheries results for FishTech, but a 'seed study' showed that a single fish pass in central Lao PDR could support passage rates of up to 8.5 tonnes of fish per annum. This would be enough to meet the daily protein requirements of 285 children annually. FishTech will also lead to better integration of Gender Equality, Disability and Social Inclusion (GEDSI) considerations into all aspects of project design and implementation. A GEDSI strategy has been developed to adopt fish passes, and a GEDSI-enhanced fish passage masterclass will be run in Cambodia in 2024.

**Environmental:** The increased adoption of fish pass technologies into river developments will also enhance the diversity of fish communities. Results from the seed study showed that the same Central Lao PDR fish pass mentioned above passed over 100 species into an adjacent wetland. New species appear where they have not been seen for over 20 years. In addition, the fish passes constructed due to FishTech have restored connectivity to 8,900 km of river for other aquatic animals.

**Economic:** The LMB fishery is estimated to have a first sale value of around US\$17 billion per annum, so any reductions in fishery productivity caused by disruptions to fish passage are likely to have profound economic consequences. Restoring fish passages, such as the Central Lao PDR fish pass alone, would generate US\$8500 of



fishery-based income per annum, assuming a conservative fish price of US\$1/kg.

## Successes and lessons learned

### *Having team members based in-country*

River development activities often require team members to rapidly mobilise to the site and make time-bound decisions, which are critical to project success. A network of staff based in the region who can mobilise to the site rapidly is essential for navigating decision-making points.

### *Importance of existing relationships*

It takes time to develop trust and working relationships. FishTech was already advantaged and able to quickly mobilise through existing long-term partnerships, which had matured over the past 15 years. Leveraging these contacts has been critical.

### *Masterclasses by 'default'*

Significant effort has been put into developing masterclasses as the default mechanism for increasing working relationships between the community and implementing agencies. The curriculum has been specially designed as a hands-on learning approach, using real-world examples to implement solutions to river development challenges. Many fish passes have now been built across the LMB through masterclass approaches.

### *High-level dissemination*

The best way to facilitate the policy/legislation space is when there is high-level support for a concept. Such support is gained through demonstration. FishTech facilitates this through excursions and visits to implementation sites in-country and by exhibiting a mobile demonstration fish pass 'model' at stakeholder events.

Visit the website for more information:  
<https://infisheriesresearch.com>.



Photo credits: Jim Holmes



## Low-cost systems to double levels of animal-sourced protein production for Bangladesh

**Objective:** To improve Bangladesh's food security through low-cost animal-sourced protein production.

**Lead countries/organisation(s):** Charles Sturt University Gulbali Institute, The University of Sydney, Bangladesh Livestock Research Institute (BLRI).

**Place:** Bangladesh

### Background and objectives

The supply of animal-sourced protein to those most in need is limited in Bangladesh, primarily due to supply and cost. Whilst species such as Napier grass exist as a primary feed source for ruminants, current management limits the nutritional value of this feed and the scope of production. In addition, farmers are crossbreeding dairy and beef cattle. In so doing, they are increasing the gap between nutrients required and available, and introducing additional animal health problems. Our objective was to improve feed quality through simple changes in defoliation management and, by doing

this, improve Bangladesh's food security whilst reducing the cost of production.

### Actions

A five-year research project was implemented based on co-design with BLRI staff and smallholder farmers. We implemented two phases of work across these five years. Phase 1 determined the impact of varying defoliation heights, cutting severities, and plant densities on Napier grass's nutritional value and yield. Phase 2 determined the effect of improved Napier grass management on live weight gain for Red Chittagong cattle. Conventional management was contrasted with a new best practice management, which increased defoliation frequency (by reducing the cutting height).

### Results

Our work markedly improved the quality of this grass (crude protein from 8 to 18% and metabolisable energy from 7.5 to 9.5MJME/kgDM) by increasing the



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Cameron  
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University

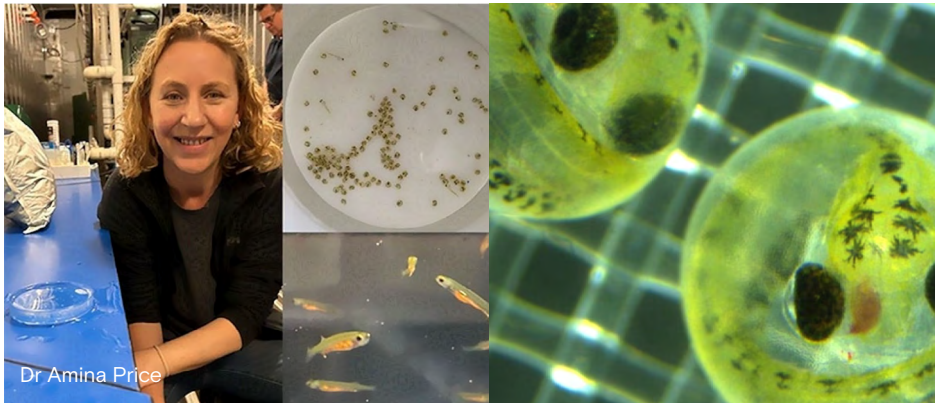
frequency of defoliation (cutting) such to limit the accumulation of fibre which typically occurs as plants mature, but growth was reduced. We overcame this by increasing the plant density such that we now have a Napier grass system with high levels of development (35 t DM/ha/year) alongside markedly improved quality.

Our next stage of this research was to determine the impact of Napier grass management on animal production. For this work, we used the indigenous Red Chittagong cattle, offering Napier grass managed according to the current or our new best practice protocol. Red Chittagong cattle yearling growth doubled from 0.3 to 0.6kg/animal/day, noting that the mature live weight of this breed is around 200-300kg, so our new levels of growth when converted to a mature live weight basis of heavier animals, such as those in Australia, are very good. Further work is needed to determine the broader impact of this new system on milk production and, more broadly, across the social, environmental, and economic domains.

**Social:** The increased supply of animal-sourced protein by smallholder farmers flows directly into the communities that surround them, helping improve human health, given the markedly increased supply of quality food.

**Environmental:** Whilst not directly measured, the outcomes of this work will reduce methane output per unit of product, given the improved feed quality.

**Economic:** Farmers have access to high-quality forage throughout the year, improving milk and meat production at approximately half the current cost. From this, farmers' income is increased through improved livestock productivity and the potential for surplus forage sales.



## The critically endangered Stocky Galaxias breeding program

Researchers at the Gulbali Institute, led by Dr Amina Price, have successfully bred the critically endangered Stocky Galaxias in captivity for the second consecutive year. The fish are only known to exist in two stream sections, both approximately four kilometres long, in Kosciusko National Park. In 2023, the Institute marked a groundbreaking achievement with the world's first hatching of these delicate fish under controlled conditions. And now, the team's hard work has paid off again, with almost 500 'babies' in the aquatic lab.

Gulbali Institute Executive Director, Professor Lee Baumgartner, said "This required the team to build a special laboratory that can mimic the alpine conditions, and it took several years of trial and error to find the right mix of conditions to deliver the 'bumper' breeding year. What is even more remarkable is that it is estimated that only 3,000 fish remain in the wild. This represents a significant milestone for the long-term survival of this species."





Listen to Professor Lee Baumgartner, Executive Director, Gulbali Institute, discuss the need to embrace Gulbali values and understand country, his big research ideas, the challenges facing Australian freshwater river systems, and the important research program he is leading to address these challenges.



Dale Nimmo, a Professor of Ecology and fire ecology expert, is the 2024 Australian Ecology Research Award winner. Professor Nimmo leads the Conservation in Human Landscape lab at the Gulbali Institute and has contributed innovative research on Australian mega-fires and conserving Australia's biodiversity.

# Healthy, safe, and well regional communities

Charles Sturt researchers are making new discoveries to ensure that all regional Australians lead dignified and rewarding lives.



Professor Jing Sun  
Distinguished  
Professor and Chair  
of Biostatistics

## Research grants

In collaboration with university partners, Distinguished Professor Jing Sun has been awarded a prestigious grant of AU\$2,333,362 from the Medical Research Future Fund.

### Project name

A phase III, multicentre, randomised, double-blinded, placebo-controlled clinical trial of SpironolactOne and famciclovir in progressive multiple sclerosis: the STOP-MS trial.

### Project summary

The Epstein-Barr virus (EBV) that causes glandular fever has recently been identified as the likely primary cause of multiple sclerosis (MS). Progressive forms of multiple sclerosis can have a significant impact on quality of life and are currently hard to treat. We have selected two potential anti-EBV therapies (spironolactone and famciclovir) to test in an innovative multistage, multi-arm trial to identify the best treatment for progressive MS. Treatments will be compared to dummy treatment. Twenty major hospitals across Australia will participate in the study. If spironolactone or famciclovir proves to be effective in reducing disability progression in people with MS, the chief investigator team will apply to the Therapeutic Goods Administration for a new indication (progressive MS) for the relevant drug and prepare new treatment guidelines.





Associate  
Professor  
Julaine Allan

In collaboration with university partners, Professor Jing Sun was awarded a prestigious grant of AU\$709,714 from the Australian Research Council. This notable funding supports their cutting-edge project on cellular ageing, marking a significant step forward in the field.

### Project name

Cellular ageing: is the plasma membrane the control hub?

### Project summary

This project aims to determine whether the plasma membrane lipid composition is a significant driver of cellular ageing. It expects to generate new knowledge in the molecular mechanism of cellular ageing, utilising our team's deep expertise in lipid biology, bioinformatics, biophysics, extracellular vesicle biology and cellular ageing. Expected outcomes include the identification of novel cellular ageing markers and anti-ageing targets while cementing long-standing partnerships and fostering new interdisciplinary collaborations. This cellular ageing study will provide novel insights into the basic principles of cellular behaviour, e.g., growth, differentiation, communication, and death, reinforcing Australia's leadership in biological science.

Associate Professor Julaine Allan secured AU\$4.3 million in funding to advance research dedicated to schizophrenia-focused therapy through the Australian Government's Medical Research Future Fund.

### Project name

Translating cognitive remediation therapy into mental health practice.

### Project summary

This study will rapidly translate an evidence-based therapy into four clinical mental health settings with a team of clinician researchers and people with lived experience of mental illness. Cognitive remediation therapy (CRT) has been shown to significantly improve cognitive and socio-occupational functioning in people living with schizophrenia and related conditions. Although cognitive remediation therapy is currently recommended in Australian treatment guidelines, access to the therapy is limited. This study will examine the implementation and outcomes of cognitive remediation therapy. The therapy will be delivered across diverse settings to determine its impact and identify suitable translation strategies for the future.



## Eliminating schistosomiasis from Asia

Professor Allen Ross from the Rural Health Research Institute and colleagues have just published a ground-breaking NHMRC-funded trial that will help eliminate schistosomiasis in Asia. Schistosomiasis is a neglected tropical parasitic disease caused by the genus *Schistosoma* blood flukes. *Schistosoma japonicum* is zoonotic in China, the Philippines, and Indonesia, with bovines acting as major reservoirs of human infection.

The trial's primary objective was to examine the impact of a combination of human mass chemotherapy, snail control through mollusciciding, and SjCTPI bovine vaccination on the rate of human

infection. A 5-year phase IIIa cluster randomised control trial was conducted among 18 schistosomiasis-endemic villages comprising 18,221 residents in Northern Samar, The Philippines. Bovine vaccination resulted in a statistically significant decrease in human infection across all trial follow-ups.

The best outcome of the trial was when bovine vaccination was combined with snail mollusciciding. This combination resulted in a one-third reduction in human infection. This is the first trial to demonstrate the effectiveness of a bovine vaccine for schistosomiasis in reducing human schistosome infection.

Charles Sturt University

In Conversation with Virginia Haussegger AM

Research futures

**Allen Ross**  
Professor and Executive Director, Rural Health Research Institute

Listen to Allen Ross, Professor of Medicine Rural, Health Research Institute, discuss health inequality, the need to address the sources of inequality in vulnerable communities, and what success looks like for the Rural Health Research Institute at Charles Sturt.





## Charles Sturt University Biosecurity Hub

The Charles Sturt University Biosecurity Hub is a leading research and innovation hub, driven by a AU\$30 million investment from the university and its partners in government and industry. With a focus on safeguarding Australia's environment, community, and economy, the hub's growing program of biosecurity activities is dedicated to identifying and mitigating biosecurity threats. Through strategic partnerships with higher education institutions, research organisations, governments, and local communities across the Indo-Pacific region, the hub is strengthening the biosecurity resilience of our neighbouring countries, ensuring a safer and more secure future for all. The hub brings together a multidisciplinary team of expert researchers and scientists from various fields, including microbiology,

ecology, veterinary and animal science, environmental science, AI and cyber futures, extended reality, and biosecurity training. With access to state-of-the-art facilities, including cutting-edge laboratories, greenhouses, synchrotrons and field testing sites, our researchers are equipped to investigate the complex interactions between pathogens, hosts, and environments. From understanding the molecular biology of emerging diseases to developing novel diagnostic tools and vaccines, our researchers are committed to advancing the field of biosecurity and driving innovation in response to the evolving biosecurity landscape. We are able to disseminate information back to the farm gate through initiatives such as the Charles Sturt-led Southern NSW Drought Resilience Adoption and Innovation Hub.

# Educated, adaptive, and inclusive regional communities

Charles Sturt researchers are increasing public awareness and knowledge in the key public policy problems of our time from climate change to social exclusion and meeting the challenges of the Fourth Industrial Revolution through AI and new technologies.



## The Living Hot Project

Charles Sturt University has announced a new research project to help 'shift the dial' on the nation's approach to the climate change predicament and progress beyond reducing emissions to preparing for life in a new and less amenable climate.

This coincided with the launch of a new book, *Living Hot: Surviving and Thriving on a Heating Planet*, by Charles Sturt University Vice-Chancellor's Chair of Public Ethics Professor Clive Hamilton AM, and highly respected energy expert, Dr George Wilkenfeld.

### About the Living Hot Project

The Living Hot Project is a team of researchers and experts working on climate change adaptation and resilience. It is led by Professor Clive Hamilton AM.

We hope the Living Hot Project will represent a turning point in the development of the debate over climate





Building a resilient nation means changing how we think about the future and transforming how we live and work. Charles Sturt's leading role in research in agriculture positions us well to support the transitions needed to ensure Australia's food security for the decades ahead.

Global heating presents particular challenges for First Nations peoples, especially those living in regional and remote areas. The Living Hot Project will explore the implications of the changing climate for caring for Country.

change in Australia. In addition to a continuing emphasis on reducing GHG emissions—Charles Sturt is a leader among universities in cutting its own emissions—we need to become much more focussed on how we are going to respond to the severe stresses due to global warming that we know are coming our way—in fact, that are already here.

The Inter-governmental Panel on Climate Change has warned that dangerous warming of the Earth is inevitable, bringing more extreme weather events along with social and economic disruptions. While we must do our fair share in cutting emissions, it is already apparent that climate change will affect our lives in Australia for generations to come.

The Living Hot Project is predicated on the fact that if Australians are to cope with the dangers ahead, we must shift our attention to a sustained program of investment in protecting the country and our way of life from the ravages of floods, bushfires, droughts, storms, cyclones, and heatwaves.

The project takes a particular interest in building resilience by local communities and local councils. Its research will shape the national conversation, not least around the effects of global warming on the most vulnerable in our communities. Although Australia is lagging in making preparations for the changing climate, there are pockets of forward-looking activity that hold lessons for the broader community. The University's research program will study prototypes of adaptation activity by communities, local councils, utilities, and businesses in Australia, as well as examples that might serve as models for others.

We hope that the Living Hot Project will help 'shift the dial' on the nation's approach to the climate predicament and push us all into the next phase—beyond reducing emissions towards preparing for life in a new and less amenable climate. We know that failing to begin preparing now will cause unnecessary suffering—for all of us but particularly for those least able to protect themselves from the impacts of a changing climate.



The discussion panel at the launch (left to right) Greens Senator Nick McKim, journalist Michelle Grattan AO, Professor Clive Hamilton, Professor Stan Grant Jnr (Chair), Mrs Bridget Archer MP, Independent Senator David Pocock, and Charles Sturt Vice-Chancellor Professor Renée Leon.

Charles Sturt University

Living Hot - Surviving and thriving on a heating planet

Professor Clive Hamilton, Charles Sturt University

Professor Stan Grant, Charles Sturt University

Bridget Archer MP

Michelle Grattan AO

Senator Nick McKim

Senator David Pocock

Professor Renée Leon, Vice Chancellor, Charles Sturt University

Watch the recording of the launch of Professor Clive Hamilton and energy expert George Wilkenfeld's groundbreaking book, *Living Hot* (published by Hardie Grant) at Parliament House, Canberra. The launch was followed by a panel discussion facilitated by Professor Stan Grant Jnr and including Bridget Archer MP, Michelle Grattan AO, and Senators Nick McKim and David Pocock. This was followed by Professor Renée Leon, Vice-Chancellor of Charles Sturt University, who launched the University's Living Hot Project.



## Charles Sturt's Professor Leslie Weston is Awarded Fellowship of the Australian Academy of Science

Professor Leslie Weston is amongst 20 new Fellows welcomed to the Australian Academy of Science. President of the Australian Academy of Science Professor Chennupati Jagadish AC congratulated the new Fellows on their contributions to science. "Fellows of the Australian Academy of Science are among the nation's most distinguished scientists, elected by their peers for ground-breaking research and contributions that have had clear impact," Professor Jagadish said. Leslie has made an outstanding contribution to science as a Plant Biologist and Biochemist. Her research focuses on invasion ecology and genetics, chemical ecology and signalling, and

the use of biocontrol organisms for pest management. Leslie has an international reputation for her ground-breaking research techniques employing analytical chemistry, metabolomics, separation science, genomics and population and field ecology. Her research has advanced our understanding of how plants employ secondary products as chemical signalling agents, in defence strategies against pests including weeds and grazing herbivores. We are enormously proud of her achievements here at Charles Sturt University. She is an inspiration to us all!







Distinguished Professor Sharynne McLeod



Professor Clive Hamilton Charles Sturt Vice-Chancellor's Chair of Public Ethics

## Two Charles Sturt research leaders acknowledged as among Australia's best

Two leading Charles Sturt University researchers have been named in an annual celebration of Australian research excellence across 250 disciplines.

Sharynne McLeod, Professor of Speech and Language Acquisition in Charles Sturt School of Education and Professor Clive Hamilton, Charles Sturt Vice-Chancellor's Chair of Public Ethics, were named in *The Australian* newspaper's special supplement, 'Research 2024'.

Professor McLeod was named Australia's Research Field Leader for Audiology, Speech, and Language Pathology. Professor Hamilton was named one of 44 Living Legends under the Living Legends: Academics in the Spotlight category. These are the Australian academics, researchers, and scholars who dominate public discourse worldwide.

Charles Sturt University

In Conversation with Virginia Haussegger AM

Research futures

Sarah O'Shea  
Professor and Dean, Graduate Research

Listen to Distinguished Professor Sarah O'Shea, Dean of Graduate Research, discuss her focus on enriching the higher degree by research student journey, encouraging students from diverse backgrounds to take the higher degree by research pathway, and ensuring that Charles Sturt is known for widening participation in higher education.





Charles Sturt  
University



# Yindyamarra Trust

Understanding country and where you are. Caring and stewardship for country and being good ancestors



Professor Stan Grant Jnr  
Director, Yindyamarra Trust

## Invitation to join the Yindyamarra Trust

### Commit to the spirit of Yindyamarra

In 2023, I decided to walk away from my very public and high-profile role in the Australian media. After 40 years as one of Australia's most awarded and esteemed journalists and a career that took me around the world reporting from more than 70 countries and covering the biggest stories of our times, I believed journalism was failing us. Simply I did not trust journalism anymore.

I found myself at the centre of a vicious public debate over history and racism. As a significant Aboriginal leader, thinker and writer, I became a lightning rod for deep divisions in our society. I had to confront my own complicity in this miserable turn of events. I could not simply blame the failings of others, I needed to look at how I had failed.

I returned to the deep cultural principles of my Wiradjuri heritage founded in a commitment to love and peace that emerges from a love of our land and God. Since then, I have dedicated myself to breathing new life into public discourse by extending grace to all. I believe we cannot grow fruit out of poisoned earth, we must water the ground with love.

This is the fundamental offering of the Yindyamarra Trust.

The Voice referendum revealed deep fissures in the Australian community. There has been much focus and analysis on the vote and the successful 'No' Campaign but too little awareness of the paucity of public dialogue and debate that inhibited a truly informed electorate.





The issues of race, history, identity and political ideology undercut the civic unity necessary for a healthy democracy and in this way Australia mirrors the democratic recession experienced in other liberal democracies globally.

We at the Yindyamarra Trust believe it is imperative to find innovative and grace-filled initiatives to reinvigorate our democracy. These would grow out of a commitment to the principles of Yindyamarra, a Wiradjuri gift of being – founded on reciprocal and mutual respect, kindness, truth, faith, love, wisdom, and deep listening.

We believe there is no age in greater need of Yindyamarra than ours.

We live in a world in a state of flux. The old ideas are no longer sufficient for addressing the questions of the 21st century. Our society, organisations, and identities are ever more fractured and divided.

In face of this division, Yindyamarra – a unifying philosophy – is both eternal and essential. Yindyamarra offers us a way home to Country. It shifts our focus away from a dangerous obsession with who we are (and how we are unlike each other) towards an embrace of where we are, and how we share this land with each other.

We are responsible for each other.

**With your support, the Yindyamarra Trust will be able to cultivate a space for thought leadership and spiritual reflection in our national life.**

**Together, we can reach beyond the fray and fracture of politics to surrender to the gentle spirits of our land. We can root ourselves in ancient Wiradjuri traditions.**

In the next months, Charles Sturt University is aiming for a funding target of \$30 million to support the work of the Yindyamarra Trust for the next decade.

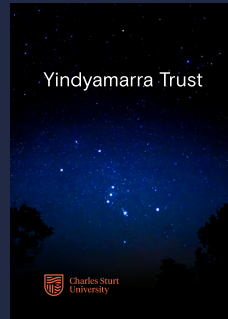
Work has already begun. We have assembled a strong team of researchers and thinkers in areas of history, democracy, philosophy and theology. We have established a Yindyamarra podcast initiating stimulating and challenging conversation with big thinkers about the most pressing contemporary issues but always with a heart of grace and compassion. We hold regular events bringing together writers and scholars to debate the questions of Australia's democracy and place in the world. We have published books and articles. We will be establishing scholarships and study retreats for young scholars to explore the dimensions of Yindyamarra in their chosen fields of endeavour.

Australians are yearning for a better way of relating to each other.

I am dreaming of that better way, too. I would encourage you to please view this video of my address to Changefest 2024, which embodies all of the principles of Yindyamarra.

Join me on this journey in my language, Mandaang Guwu.

Professor Stan Grant



Download the  
Yindyamarra  
Trust  
prospectus



# Join us

## Contact Professor Stan Grant

✉ [stgrant@csu.edu.au](mailto:stgrant@csu.edu.au) or [yindyamarra@csu.edu.au](mailto:yindyamarra@csu.edu.au)

## Find out more about making a gift to the Yindyamarra Trust

Charles Sturt University is seeking the generous philanthropic support of committed organisations and individuals.

To discuss supporting the Yindyamarra Trust contact:

## Sarah Ansell

Director of Advancement and CEO Charles Sturt Foundation

Foundation ABN 31 158 135 157

☎ 02 6933 2226 or 0409 362 683

✉ [sansell@csu.edu.au](mailto:sansell@csu.edu.au) or [Advancement@csu.edu.au](mailto:Advancement@csu.edu.au)

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Give online at

🌐 [csu.edu.au/office/advancement/giving-to-csu/give-now](http://csu.edu.au/office/advancement/giving-to-csu/give-now)



# Charles Sturt researchers leading the way



Professor Leslie Weston was elected as a Fellow of the Australian Academy of Science.

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Professor Wayne Hudson was elected as a Fellow Australian Academy of the Humanities.

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Professor Stan Grant was elected as a Fellow of the Academy of Social Sciences in Australia.

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Professor Shokoofeh Shamsi has been elected as a Fellow of the Australian Society fro Parasitology.

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Professor Bing Wang was awarded a Fellowship of the Nutrition Society of Australia.

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Professor Dominic O'Sullivan was elected as an Honorary Fellow of the Royal Society of New Zealand.

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Professor Lee Baumgartner was awarded the inaugural Crawford Fund Award, NSW.

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The Australian's Research magazine named Professor Clive Hamilton one of 44 Living Legends in the Living Legends: Academics category.

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The Australian's Research magazine named Professor Sharynne McLeod as Australia's Research Field Leader in Audiology, Speech and Language Pathology and "best in the world based on the quality, volume and impact of work".

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Professor Sarah O'Shea received the Society for Research into Higher Education 2024 Accolade: Contribution to the Field.

Professor Sarah O'Shea has been appointed to the 2025 Australian Research Council (ARC) College of Experts.

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Professor Dale Nimmo was the winner of the 2024 Australian Ecology Research Award.

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Professor Ganna Pogrebna won the AI in Risk and Cybersecurity award at the Women in AI Asia Pacific Awards.

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Professor Mark Evans was awarded a Distinguished Professorship in Public Value by the Qatar Foundation in Doha.

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# Research institutes

At Charles Sturt, we are committed to creating new knowledge that can be applied for the betterment of our communities, both global and local.

A research institute is a multi-disciplinary entity aimed at stimulating research activity and achieving critical mass around a research theme of national/international importance deliberately linked to fields of education that transcend faculty and school boundaries.

Research institutes provide a platform for external collaboration, partnership

building and engagement. They champion research excellence and leadership, are committed to creating new knowledge that benefits our communities and offer regional solutions to global challenges.

Charles Sturt's strategic research endeavours are currently organised through three research Institutes: Artificial Intelligence and Cyber Futures Institute; Gulbali Institute for Agriculture, Water, and the Environment; and Rural Health Research Institute.



## Gulbali Institute

The Gulbali Institute creates impactful, integrated agriculture, water, and environment research, grounded in Charles Sturt's footprint across the Murray-Darling Basin, but with impact across Australia and globally.



## Artificial Intelligence and Cyber Futures Institute

We're demonstrating how data science, artificial intelligence, and cyber security can better serve regional communities worldwide.



## Rural Health Research Institute

The Rural Health Research Institute (RHRI) has been established to conduct research that addresses the rural health gap in communities across regional and remote Australia and internationally.

# Research partners

Charles Sturt researchers are collaborating on a range of initiatives geared towards strengthening our areas of research focus and addressing specific regional challenges.

## Collaborative research initiatives

<b>Australian Centre for Christianity and Culture</b>	Charles Sturt created this centre in partnership with the Anglican Diocese of Canberra and Goulburn in 1998.
<b>James Martin Institute for Public Policy</b>	The James Martin Institute for Public Policy aims to transform public policy through smart collaborations that harness world-leading research.
<b>Manna Institute</b>	Manna Institute is part of an initial 3-year strategy to improve mental health and wellbeing in rural, regional, and remote Australia.
<b>Southern NSW Drought Innovation Hub</b>	One of eight hubs being established across Australia to combat drought and form the epicentre of user-driven innovation, research, and adoption.

## Cooperative research centres

<b>Food Agility CRC</b>	Food Agility brokers, designs, and delivers innovation programs for the Australian agrifood industry, ensuring maximum impact for investment.
<b>CRC for High Performance Soils</b>	Bringing together scientists, industry, and farmers to find practical solutions for Australia's underperforming soils.
<b>Cyber Security CRC</b>	Developing cyber security capability and capacity to help keep Australia safe by developing innovative, real-world research and cultivating outstanding talent.
<b>Marine Bioproducts CRC</b>	Driving Australia's transition to the 'third generation' of marine production by funding research and the development of new products.
<b>One Basin CRC</b>	Developing policy, technical, and financial solutions to support and reduce exposure to climate, water and environmental threats in the Murray-Darling Basin.

## Research networks

NSW Smart Sensing Network	A not-for-profit innovation network funded by the NSW Government through the Office of the NSW Chief Scientist & Engineer.
NSW Connectivity Innovation Network	Enhancing Australia's connectivity by leveraging academia, industry, and government expertise to drive technical innovation.
NSW Defence Innovation Network	Bringing together industry, universities, state government, and Defence to address Australia's defence needs.
NSW Decarbonisation Hub	Fostering collaboration, partnerships, and projects between industry, researchers, and government to drive decarbonisation forward in NSW and beyond.





# Strategic research initiatives

Charles Sturt hosts three strategic interventions geared towards making progress on three particularly intractable issues.



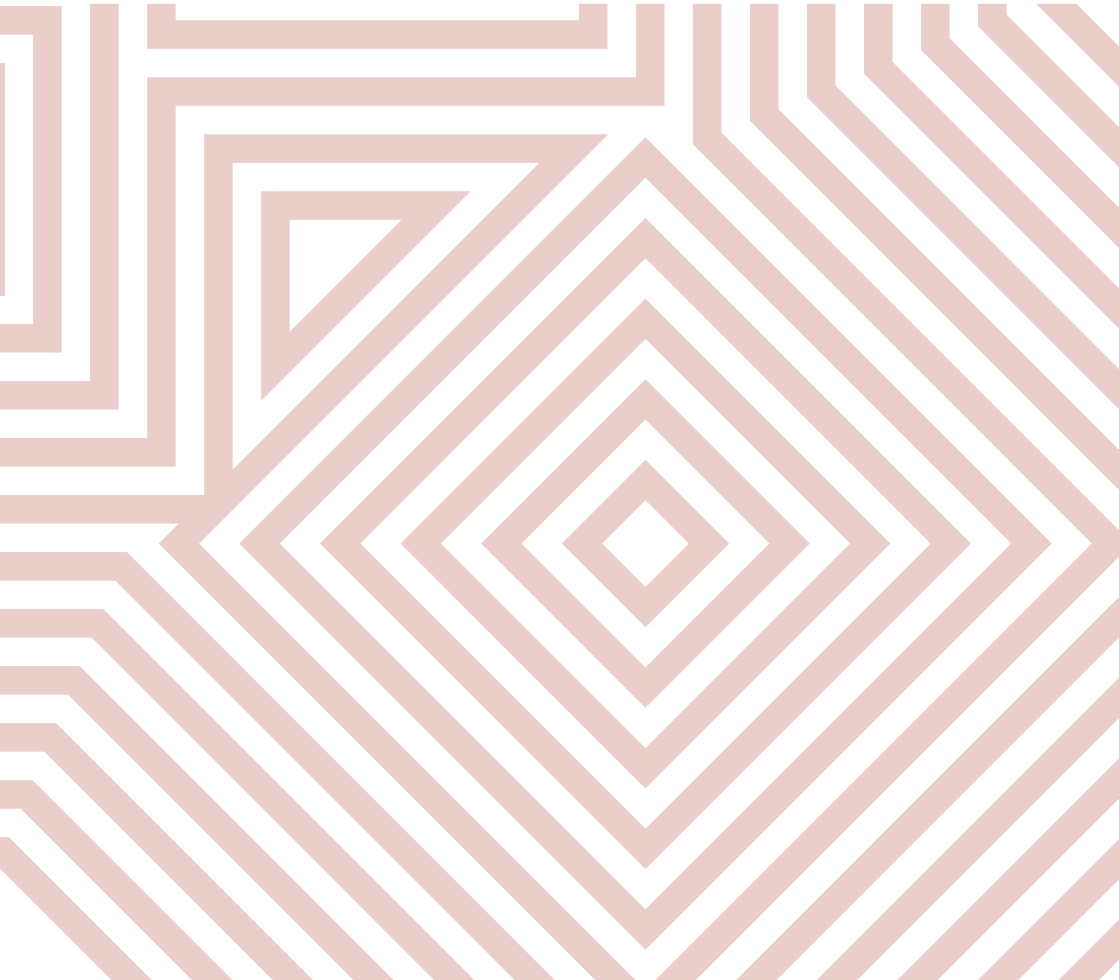
Living Hot Project



Yindyamarra Nguluway



Higher Education  
Equity Research Unit



# Research innovation facilities

Charles Sturt has a range of advanced facilities that provide a unique environment for interdisciplinary collaboration and cutting-edge research and development to support and validate our research outcomes.



## AgriPark: World-class facilities in a regional location

AgriPark is the innovation ecosystem in the heart of the Riverina dedicated to agricultural research, curated collaboration, and sustainable production.

Bringing together researchers, industry, government and community, its goal is to meet the big challenges of regional Australia. AgriPark is where collaboration, experimentation and innovation make world-changing ideas a reality; where partners share and test ideas, students gain practical skills, and researchers and investors can fast-track both ideation and commercialisation.



## Global Digital Farm

Global Digital Farm demonstrates the future of Australian farming through technology and data innovations.

Global Digital Farm is an integrated digital learning, innovation, and research environment, working within a full-scale, commercial, mixed farm operation. In partnership with Food Agility Co-operative Research Centre, it is transforming the university's 1,600-hectare commercial farm, located at the Wagga Wagga campus in New South Wales.



- 1600-hectare commercial farm
- Aquatic laboratory
- Equine Centre
- Equine isolation facility
- eXtended Reality Centre
- Field trial sites
- Glasshouses
- Horticulture facilities
- Innovative Hub
- AgriPark
- National Life Sciences Hub (NaLSH), including Quarantine-approved research areas
- Phytotron and growth chambers
- Pre-clinical centre
- Research winery and vineyard
- Rhizolysimeter
- Sheep and cattle facilities
- Veterinary Clinical Centre
- Veterinary Diagnostic Laboratory

## Call to action

We end with a clarion call for applied research excellence—a call to action to academic staff, government, industry and community partners to work with us in reimagining and delivering a prosperous future for regional New South Wales.

Contact: [DVCRnews@csu.edu.au](mailto:DVCRnews@csu.edu.au)





Charles Sturt  
University