# Environmental and Rural Science at UNE

## Postgraduate Research Opportunities

2024 – 2025

une
University of New England

# UNE Acknowledgement of Country

The University of New England respects and acknowledges that its people, courses and facilities are built on land, and surrounded by a sense of belonging, both ancient and contemporary, of the world's oldest living culture.

In doing so, UNE values and respects Indigenous knowledge systems as a vital part of the knowledge capital of Australia. We recognise the strength, resilience and capacity of the Aboriginal community and pay our respects to the Elders past, present and future.

Artwork '*Welcome to Country*' by Larissa Ahoy

# Welcome

To our Postgraduate Research Prospectus for research candidates in Environmental and Rural Science, University of New England (UNE), Australia.

# Contents

## The University of New England (UNE) located between Sydney and Brisbane on the beautiful New England Tablelands, has a long tradition of providing graduate training opportunities for research students in our Honours, Masters and PhD programs.

UNE's School of Environmental and Rural Science (ERS) is a world leader in multidisciplinary teaching and research. Our team of academics, scientists and professional technicians span the agricultural, earth and environment sciences and work together to tackle the big challenges that face our planet today.

Whether you're passionate about the natural world, seek to be at the cutting edge of agriculture or want to tackle the critical issue of sustaining our planet for future generations, ERS is the place for you. You will be supported by world class research staff, laboratories, facilities and access to a range of experimental rural properties that represent the best Australia can offer.

Our research is conducted across three interconnected research themes spanning the breath of agricultural and environmental science, applying foundational science to ensure a better future for next generations. Our active higher degree research student program supports early career researchers from Australia and around the world with unrivalled collaborations with industries across Agriculture and Environmental Science providing a gateway to a diverse range of career opportunities in industry, government and research.

This prospectus outlines our current offerings for postgraduate or higher degree research and an overview of our research priorities and the research projects we supervise. In this prospectus you will find details of our world class academic staff and our extensive research facilities, capabilities and opportunities.

We welcome both domestic and international higher degree candidates and UNE offers generous scholarships for higher degree study on a competitive basis twice per year. The scholarship process is outlined in this prospectus and includes the people that you can seek further information from should you be interested in joining our team.

We have a significant cohort of international higher degree candidates and offer a range of services for these students. Many of our students come with support from their home country to study at UNE and we often co-supervise projects with experts in the home country. It is not unusual for our staff to work alongside our international students in their home country to set up projects and to collect data.

As a domestic or international higher degree candidate at UNE you will experience a welcoming, nurturing and collegiate research environment and join our extensive lifelong Alumni networks and community.

Wishing you all the best for your graduate studies.

**Professor Karl Vernes**
**Head of School, ERS**

# The UNE Experience

**About UNE**

The University of New England, established in 1953, was the first Australian University to be located outside a capital city. UNE has a well-earned reputation as one of Australia;s great teaching, training and research Universities.

Through its leading role in the provision of distance education, UNE has contributed to the nation's development over more than half a century — while enhancing the lives of thousands of people who would otherwise have been unable to pursue university studies. Today, UNE is extending its global reach through the adoption of the latest communication technologies, and is recognised as an innovator in flexible online education.

The University of New England has a proud history of undertaking high quality research and producing valuable research outcomes. It is dedicated to identifying and delivering innovations of value to society and industry, in Australia and internationally, with a particular emphasis on inter-disciplinary research for tackling complex problems in rural and regional Australia. This research involves extensive engagement in large-scale interdisciplinary collaborations within UNE, nationally and internationally.

**Student/College Life**

At UNE, we encourage you to balance your study with an active lifestyle outside of the classroom.

Our clubs and associations are a fantastic way to make new friends and gain valuable life experiences. You can be involved in a diverse range of student groups including student associations, professional societies, sporting teams and more.

UNE hosts a range of events for our on campus and online students. Events are held on campus in Armidale, at our regional study centres and Tamworth and Sydney (Parramatta).

**UNE Life**

UNE Life encompasses several services on-campus and in Armidale, including:

- Belgrave Cinema
- Campus Bookshop
- Campus Essentials Shop - including post office, newsagent, gifts and more
- Graduation Services
- Cafe Life - coffee, snacks and light meals
- Tune FM - student run campus radio station
- The 'Stro-on-campus entertainment venue and bar
- Sleek Hairdressing
- Yarm Gwanga Childcare
- Life Functions & Catering

**Student Support**

At UNE we have a great support system for our students studying on campus and online. We're here to help you with your study, your career development and life outside of the classroom. From administrative to personal support services, our goal is to make your transition to university life as easy as possible.

Student Support provides a range of services to help you throughout your degree including counseling, student equity, disability and special needs support, student support, career development and WorkReady.

**Sport UNE**

SportUNE is considered one of the best university sporting precincts in Australia, offering variety, flexibility and a range of new facilities and services. With everything from a fitness and strength building gym, racket courts and regular fitness classes that allow you to stay fit at all times of the week through to organised sporting clubs that offer team sports throughout the seasons; SportUNE has something for everyone.

**Access to Academics**

One of the most frequent comments made by our students is that they work as colleagues with their supervisors – supervisors make the time to work side by side with their students. This brings about true partnerships and timely completions of theses – many of which are produced as a series of papers, thereby helping our graduates to begin a rewarding postdoctoral career.

For the 18th year in a row, the University of New England (UNE) has earned the top five-star rating from the Good Universities Guide for the quality of our student experience. **une.edu.au/study/why-study-at-une/awards-and-ratings**


une
University of
New England

# UNE Residential Colleges

## UNE offers flexible on-campus accommodation

**On-campus accommodation is the cheapest option, starting from $150 per week.**

Live on campus in one of our Residential Colleges and take advantage of the lower cost and convenience. All of your bills are taken care of; free, unlimited Wi-Fi, and heating included. Choose to look after your own food, or select one of our catered options. Plus you have access to academic and social support to reach your full potential. All colleges are convenient to the academic campus as well as sporting and social activities. Options range from shared facilities to self-contained apartments.

Full details on the range of accommodation options at UNE Colleges can be found at:
**une.edu.au/campus-life/une-accommodation/colleges**

**What's so great about College life?**

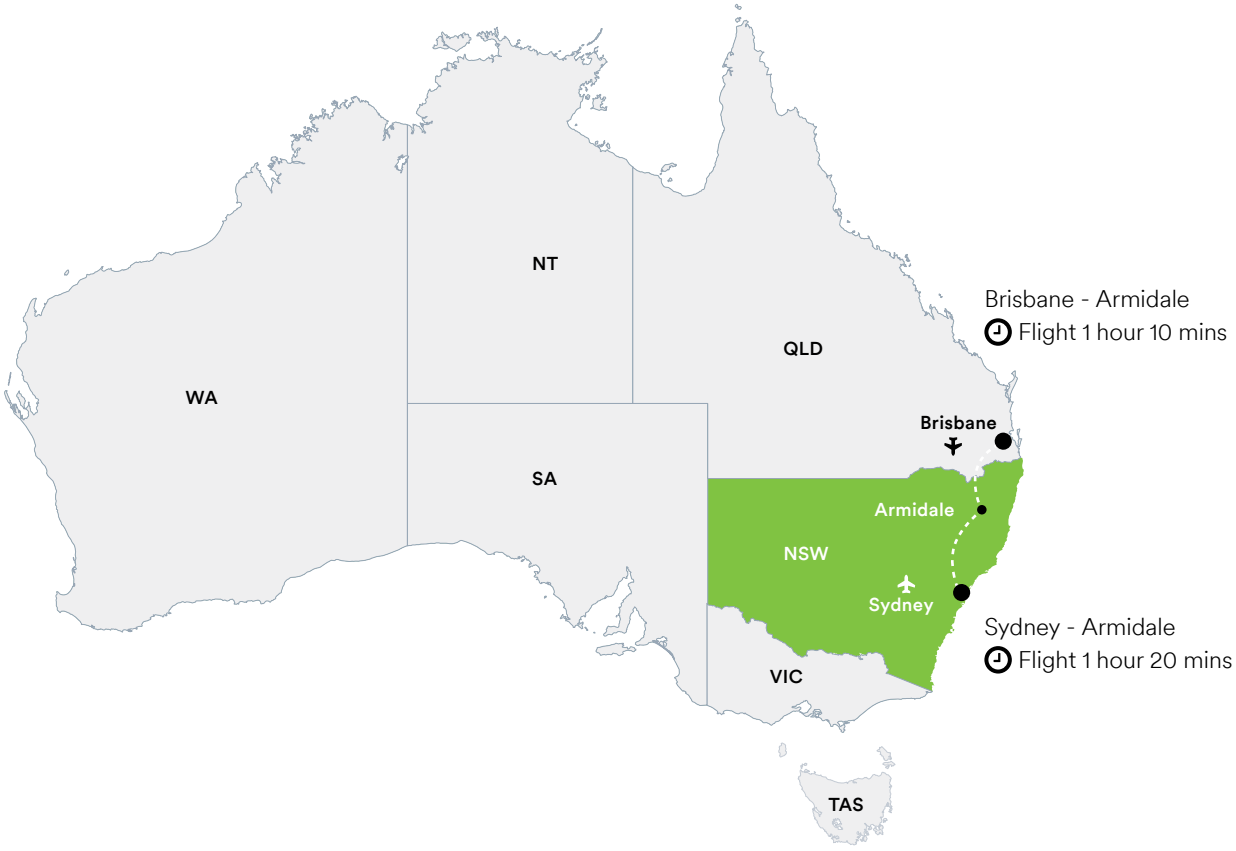
- The opportunity to make friends for life
- **Support and mentorship** – our Residential System fosters a supportive environment to enhance your academic success and future employment.
- **The ultimate lifestyle** – with a variety of social and cultural events
- **An 'inbuilt' community** – with an instant network of friends and support
- **Great opportunities** – get involved with clubs, community projects, sport, and professional experiences
- **Convenience** – live in the heart of the action with easy access to campus services
- **Great setting** – our Armidale campus is truly unique
- **More choices** – a variety of options for traditional catered accommodation, independent living, or a combination of both.

## Accommodation Scholarships

UNE is currently offering accommodation scholarships for international students.

Visit: **une.edu.au/study/international/living-in-australia/accommodation/accommodation-scholarships for full details**

Domestic scholarships are also available throughout the year. Visit the UNE Colleges website for further details.




# About Armidale

Just over a 1 hour flight from both Sydney and Brisbane, Armidale offers the best of both city and rural living. Enjoy a healthy and active lifestyle with access to shopping, gourmet food, top sporting facilities and cultural delights all for a fraction of the price you'd expect to pay in a major city. You can live in the heart of Armidale or experience the tranquility of New England on a rural property.

What is also so appealing about Armidale is that it's a cosmopolitan and sophisticated urban centre located in a picturesque rural setting on the doorstep of some of the most scenic national parks in Australia.

Armidale has a national reputation for primary, secondary and tertiary education. It also boasts extensive recreation and parkland spaces, perfect for a family friendly lifestyle.

One of Armidale's major advantages is the many national parks, each with extraordinary natural attractions, all within an hour's drive from the city centre. There's a monumental tumble of giant granite boulders to climb in the Cathedral Rock National Park. Along the aptly named Waterfall Way, Ebor Falls in the Guy Fawkes River National Park is one of several majestic waterfalls to admire. Much of the extensive wilderness in the New England and Oxley Wild Rivers National Parks is World Heritage listed. Views from Point Lookout in the New England National Park stretch over forests to the Pacific Ocean. You can walk along the trails that wind through temperate rainforest or hike through the spectacular gorges and encounter dramatic waterfalls and hundreds of kilometres of pristine waterways.

The proximity to these eco-systems and agricultural regions makes UNE the perfect base for research.

# Environmental and Rural Science Research Priorities

**In the School of Environmental and Rural Science, we aim to 'save the planet and feed the world':**

- Animal Science
- Plant, Soil and Environment
- Life, Earth and Environment

## Animal Science

Our research activities are grouped around three key Research Themes.

In this research theme we are looking for ways to produce food and fibre from animals in an efficient and sustainable manner both within Australia and internationally. We are also seeking to better understand the care and management of companion animals.

**Key research themes include:**

- Production efficiency and carbon Management
- Integrated health and welfare
- Livestock and product quality

## Plant, Soil and Environment

Without healthy green plants we would neither breathe nor eat. Of all the food the world requires each year, most comes from plants, which synthesise it out of air, sunlight, water and soil. The remainder comes from animal products, which in turn are derived from plants. The researchers working within the Plant, Soil and Environment Systems (PSES) theme in the School of Environmental and Rural Science at UNE are finding ways to retain and improve the health and productivity of these plant, soil and environment systems for our current and future needs.

**Key research themes include:**

- Root zone processes
- Pollution and Environmental stressors
- Plant Production Systems

## Life, Earth and Environment

With its vision of: Science for understanding, conservation and restoration of our natural world, the Life, Earth and Environment research theme is a highly active community of academics engaged in discipline-based and interdisciplinary research that spans ecological and built landscapes. Our purpose is to undertake high quality research that improves our understanding of ecosystem, earth sciences and biodiversity, as a means to advance ecosystem resilience, and to inform management practices that contribute to ongoing sustainable landscape use and restoration. Join us to advance your studies in one of our focus research areas.

Our **Life** sub-theme embraces specialties of:

- physiology
- behaviour and ecology of faunal groups
- evolutionary biology
- genomics of extinct and extant floral and faunal taxa
- insect and vertebrate social behaviour
- mammalian energetics
- form and function in living and fossil animals
- parasite biology
- large scale landscape and movement ecology of vertebrates

Our **Earth** sub-theme integrates our planet's geological and prehistoric past and the cataclysmic processes that shaped the earth. Our internationally-recognised staff has diverse expertise in vertebrate and invertebrate palaeontology, biostratigraphy, tectonics, as well as sedimentary, igneous and metamorphic geology.

**Key research interests include:**

- Sedimentology
- Structural and metamorphic geology
- Mineralogy and mineral deposits
- Detrital mineral geochronology and geochemistry
- Geophysics and geological mapping
- Palaeobiology, palaeoecology and palaeobiogeography

Our **Environment** sub-theme unites the multiple disciplines and scales involved in ecology and environmental management. We apply rigorous science to inform the management of a range of natural and altered aquatic and terrestrial ecosystems.

Our interests range from fundamental research into the biology and biogeography of Australian plants, biochemical and biotic processes in aquatic systems, and faunal and floral conservation. Environmental management incorporates: understanding landscape dynamic using spatial science tools; investigating ecosystem services in agricultural landscapes; governance of socio-ecological systems; and rehabilitation of modified ecosystems.

**Research Interests include:**

- Biogeochemical processes in aquatic systems
- Biology, biogeography and taxonomy of Australian plants
- Mammal ecology and conservation
- Rehabilitation of wetland and riverine systems
- Conservation and management of endangered plants
- Mammal conservation and management
- Ecosystem services in agricultural landscapes
- Science, management and governance of social–ecological systems
- Waste management and environmental impacts of waste treatment
- Heritage engineering
- Earth Observation, Remote Sensing and GIS

# Our Research Programs

## The School of ERS offers a wide range of post graduate courses.

### Postgraduate Research Courses

With appropriate undergraduate or postgraduate qualifications, you can choose to go straight to a post-graduate program through research which include:

- Honours programs to extend your bachelor degree. An honours program provides a direct pathway from undergraduate to a postgraduate degree by research
- Research Masters for a deeper level of study
- PhD for a significant body of research work in a particular field of study

If you are doing a Masters by coursework and want to go on to do a higher degree by research, ensure there is an approved research component to your Masters program. Faculty staff can advise and help you with this. The Faculty recognises the significant contribution that Higher Degree Research students and their supervisors make in ensuring and maintaining a vibrant academic, research-led community and aims to achieve a high standard of excellence in learning, research and supervision.

After exploring the opportunities for study in a particular area, you are encouraged to complete an Expression of Interest for Higher Degree Research Students form and email it to ers-hdr@une.edu.au. The submitted EOI form will be forwarded to suitable academic staff who will contact you discuss your interest in postgraduate research.

If you are interested in higher degree research in the School, please visit **une.edu.au**:

**UNE International**

**Scholarships**

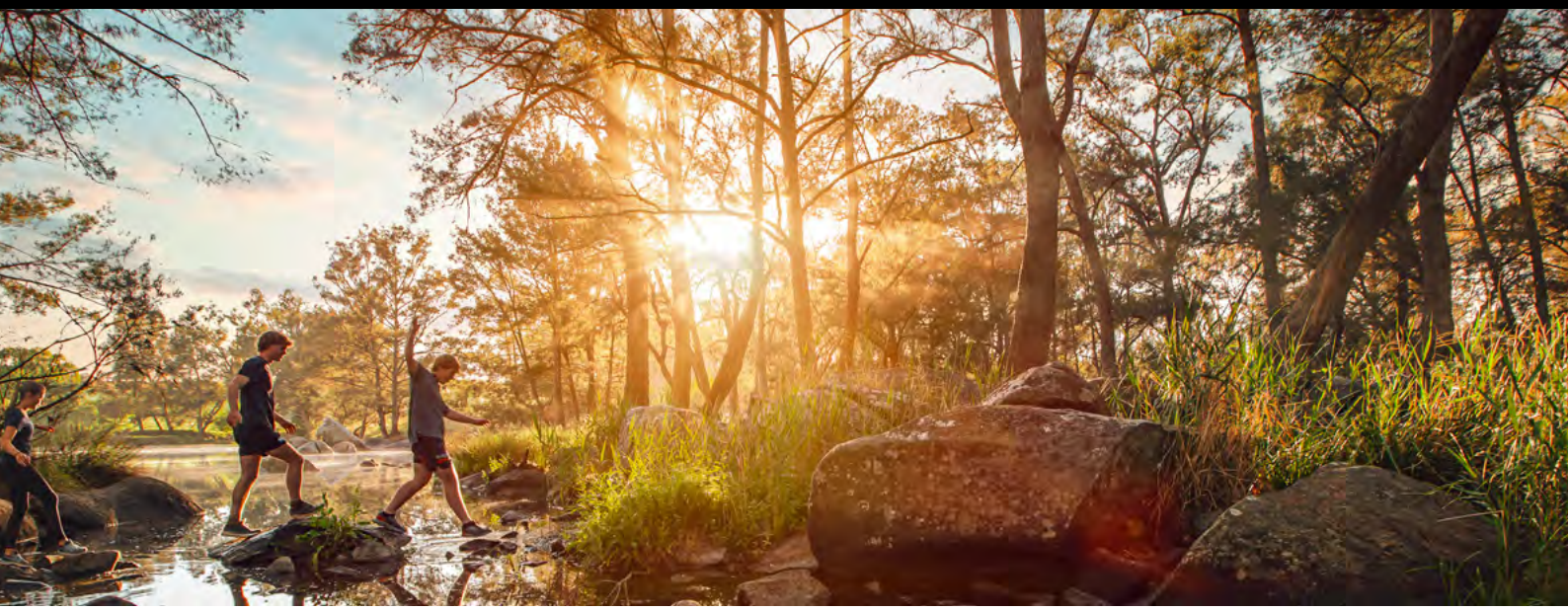
**Accommodation and Living Costs**

**Higher Degree Research**

**English Language Centre**

**Visas and Fees**

**Honours Programs**



# Research Facilities

## Australia's greatest outdoor lab

Imagine that you could be transported to a place that had within an hour's drive — tall eucalypt forests, grassy woodlands with abundant wildlife, cool-temperate rainforests, warm-temperate rainforests and an amazing opportunity to see rivers flow west into the rangelands or east into the coastal humid forests. Armidale is that place.

Our students enjoy amazing opportunities to use these natural ecosystems for their studies; incorporating a variety of wilderness areas, World Heritage Parks, National Parks, State Forests or rural properties with natural grazing systems. The wildlife is spectacular – not only can you see the shy and retiring koala, but echidnas, quolls, dingoes, bats, several species of kangaroo and, as the area is a corridor for migratory species, you will see ever changing bird populations of some 350 species. We estimate that there are some 4, 500 plant species in northern NSW – many poorly known or with restricted distributions but with populations requiring conservation research.

Some recent projects undertaken by our students include; plant pollinator networks in an endangered ecological community, the systematics of the daisies Coronidium, Xerochrysum (Asteraceae: Gnaphalieae), changing climates and the impact on the rusty fig (Ficus rubiginosa), cost-effective revegetation technologies, how habitat structure affects distribution patterns of freshwater species, gene flow in eucalypts, fire management of wilderness areas and macropod conservation and management.

Look through the list of supervisors and their current research interests and contact the relevant academic for further information. Reading their recent research papers before you contact them will allow you to ask specific questions about a potential project for you.


Kirby_K12
Kirby_K15
Kirby_K20
2807.95
933.86
381.53
NEC

**8 properties**
**covering**
**3,655**
**hectares**

# UNE SMART Farms

**UNE SMART Farms are valuable resources that enable UNE researchers and their industry and community partners to conduct world-class activities that encompass Sustainable, Manageable, Accessible, Rural Technologies (SMART).**

Supporting a range of disciplines including natural and agricultural ecosystems, poultry, livestock, precision agriculture and zoology, the SMART Farms offer researchers and postgraduates the space, environment and facilities to work and partner with industry to solve real-world problems.

The SMART Farms also provide the context for problem-based experiential learning for undergraduates and for community activities. To have these wonderful resources located just minutes from the UNE campus is a major strength for those working and studying at UNE.

Made up of eight properties covering 3,655 hectares, the UNE SMART Farms are diverse and valuable teaching and research resources. With the exception of Tullimba, the Farms are located adjacent to or within a 5 minute drive of the main UNE campus, allowing easy access for research and teaching activities. Tullimba is located 40km west of Armidale.


UNE SMART Farms
8 properties covering 3,655 hectares
Maxwellton
Trevenna
Tullimba
40 kms south west of Armidale


Kirby
Newholme
W
E
une
Campus
Laureldale
Clark's Farm
Toombs
une
University of
New England
SMART Farms

# Newholme

**Property Size: 1790 ha**

**Forested Rural Property / partially cleared & grazed**

**Main area of research:**

Natural resource management, zoology, botany, ecology and agricultural sciences

**Infrastructure:**

Field Laboratory, camera trap network

**Nestled at the base of the Mt Duval, Newholme Field Laboratory is an ideal base for ecological research in native flora and fauna and undergraduate teaching.**

Across Newholme are long term soil, vegetation and wildlife monitoring sites that provide a picture of the change to the natural ecosystem with different farm management practices including grazing, deforestation and reforestation. These sites provide valuable information on the changes in flora and fauna species and nutrient cycling. Across Mt Duval are 25 camera traps monitoring both native and invasive fauna, and remotely feeding back to a computer in the Newholme Field Laboratory. These cameras record activity from native animals including four main species of macropods and koalas along with other animals such as foxes and deer.

Newholme is unique among UNE's Smart Farms in having large tracts of natural forest cover (with several forest types) giving it an overall high conservation value. Part of what makes Newholme highly valuable to research is the partitioning of the property into grazed and ungrazed components, in both woodland and pasture. Approximately one third is forested, a third is open woodland, while the remainder is native pasture.

Subsets of the forest and woodland types and riparian zones have been de-stocked since 1982 to provide contrasting land management treatments. Most of the property is managed in an agriculturally un-manipulated manner other than grazing, to maintain research and teaching options (e.g. imposition of particular land and water treatments) as well as land and water uses representative of the surrounding region.

# Kirby

**Property Size: 746 ha**

**Grazing Property**

**Main area of research:**

Sheep genetics and production, precision agriculture, pasture systems, poultry and agronomy

**Infrastructure:**

SMART Farm Innovation Centre, Kirby Observatory, shearing shed and sheep handling facilities, sensor networks, high performance pasture paddocks

**Managed as a commercial sheep and cattle property, Kirby provides the research platform for genomic technologies and high performance pasture systems and makes use of a heavily-connected landscape for remote monitoring of livestock systems.**

A large sheep flock forms part of the MLA Resource Flock providing genomic information for industry that will increase the accuracy of breeding values and accelerate genetic gain, especially in hard to measure traits such as sheep meat eating quality.

On-farm connectivity comprises the latest and emerging methods. The networks are linked to the outside world via fibre, fixed wireless and satellite national broadband network, and the AARNet national fibre network. The SMART Farm Innovation Centre is an 'instrumented' research and teaching laboratory and the ultimate site to evaluate and inform innovations in practice and new technologies in a working farm environment.

The SMART Farms are an ideal environment for innovation in areas including: spatially-enabled livestock management; earth observation systems monitoring feed base and land use sustainability; livestock and pasture datasets, weather; and data integration to assess the effectiveness of management decisions and optimise planning of new infrastructure. Kirby provides a base for research in any of these areas but also serves as an education and outreach facility to connect researchers with students, producers, industry and the community.

# Tullimba

**Property Size: 740 ha**

**Research feedlot**

**Main area of research:**

Feed efficiency, meat quality, animal performance, video image analysis

**Infrastructure:**

2000 head research feedlot

**Tullimba is a world-class feedlot research facility designed to provide research and training opportunities to enhance the international competitiveness of the Australian Beef Industry.**

Tullimba uses GrowSafe feeders to monitor individual feed intake and allow calculation of breeding values for feed efficiency in beef cattle. A recent expansion of this system has seen the addition of 16 new GrowSafe Feeders and an In Pen Weighing System. GreenFeed units allow measurement of methane emissions from individual animals. Utilised by industry and commercial beef producers (for occasional custom feeding) this feedlot provides the facilities to investigate issues such as feed efficiency, behaviour and effluent management. Tullimba is also home to a 1300 ML dam with a large irrigation licence. Trade and breeding cattle run on pasture are also a valuable resource for grazing beef production research.

Recent upgrades have added a grain tempering plant and computerised feed-out wagons to improve efficiency of feed mixing and animal performance.. Tullimba provides the ideal facility to encourage greater cooperation between geneticists, nutritionists and meat scientists, and is designed to connect R&D outcomes with the feedlot industry.

# Laureldale

**Property Size: 172 ha**

**Intensive animal systems**

**Main area of research:**

Agronomy, poultry and canine research

**Infrastructure:**

Agronomy plots, caged, barn and free range poultry facilities, canine training and research facilities

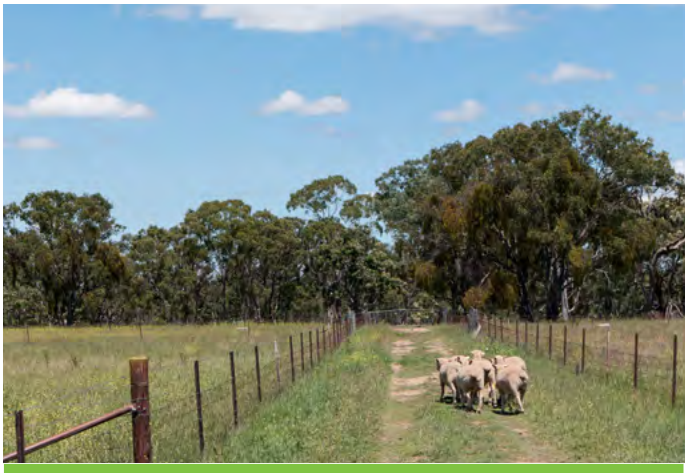
**Located adjacent to the main UNE campus Laureldale is used for evaluation of crops and pastures, assessment of poultry health, behaviour and productivity, sheep parasitology and dog research and training.**

Long-term agronomy plots are used for crop research including assessing wheat varieties for genes that confer resistance to the Barley Yellow Dwarf virus.

Poultry facilities are operated to perform research in both, free range egg and meat production to mimic and assess industry and commercial practice in these areas. The layer facilities include an open curtain shed with battery cages, a barn shed and 40 free-range layer pens while the broiler facilities include four 20 x 40 m rooms with independent ventilation, lighting control and variable partitions along with other facilities with floor pens and battery cages. Some of these facilities are equipped with video monitoring that can be accessed remotely for monitoring and managing of the animals.

The recently upgraded Laureldale Canine Research and Training Facility provides the opportunity for controlled studies in canine behaviour, training and nutrition. Research is non-invasive, using privately-owned dogs. Some of the current research focuses on scent detector dogs utilised for quarantine, in collaboration with the Department of Agriculture forestry and fisheries.

# Trevenna



**Property Size: 31 ha**

**Teaching and community recreation**

**Main area of research:**

Agronomy and soil science undergraduate teaching

**Infrastructure:**

Agronomy plots

**Located within a short walk from the agriculture precinct and glasshouses, Trevenna, provides an ideal location for small scale agronomic and sheep production research and teaching.**

With small plots fenced to exclude livestock, native animals such as kangaroos and pests such as rabbits, this property allows for undergraduate crop competitions and small crop experiments. Soil pits have also been excavated for soils teaching. Insect traps are also deployed on this property for entomological collection for teaching and research.

In conjunction with Maxwellton, sheep research projects related to grazing management, wool production, parasite management and lambing are conducted.

A major proportion of Trevenna is a pine forest planted as a commercial forest lot. This forest is now home to a mountain bike track used by the Armidale community.

# Maxwellton

**Property Size: 119 ha**

**Livestock behaviour and production**

**Main area of research:**

Sheep behaviour and production; grazing and parasite management

**Infrastructure:**

Grazing plots

**Located within a short walk from the campus, Maxwellton provides an ideal location for livestock production research and teaching.**

Maxwellton lies immediately to the west of the UNE campus, is watered by Dumaresq and Pipeclay Creeks and encompasses a range of soil types. Split into a number of smaller paddocks this property is used for sheep production, parasitology, reproduction and grazing research and teaching. With a range of topography across paddocks Maxwellton provides a variation in feed and shelter availability. The proximity of this property to the main UNE campus also makes it ideal for student research.

Maxwellton is used to collect data underpinning the development of biophysical models of livestock production and health, greenhouse gases and animal behaviour. A recent project studied guarding behaviours of alpacas when grazed with lambing ewes. On-animal monitoring technologies permitted the study of animal behaviours in responses to threatening and nonthreatening stimuli.

# Toombs

**Property Size: 27 ha**

**Pasture technology field site**

**Main area of research:**

Pasture variety trials and breeding

**Infrastructure:**

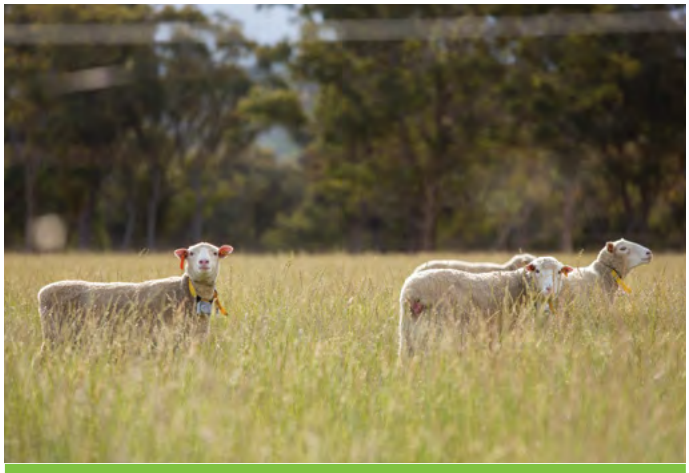
Pasture plots

**Connecting with industry the pasture technology site is used to evaluate the performance of a range of pasture and forage crop varieties.**

The Toombs UNE block is currently leased by PGG Wrightson Seeds for evaluating forage plant genetic performance and to undertake agronomic trials in the New England. PGG Wrightson Seeds is involved in a wide range of research to assist agronomists, farmers and rural retailers achieve a greater understanding of pastures and crops, improving productivity and profitability on-farm. Their network of research facilities allows them to breed and evaluate new products under animal grazing, prior to commercial release. This helps ensure each cultivar delivers the production gains anticipated and is safe for animal systems. Approximately 200 trials are conducted annually at over 15 trial sites (one of which is Toombs) throughout the country, making it the largest replicated pasture trial programme in Australia.

Some of the key species currently being evaluated at Toombs include Cocksfoot, White Clover, Annual, Italian and Perennial Ryegrass, Continental Tall Fescue, and novel endophytes. Small research projects on grazing animal behaviour and performance, particularly sheep, are also able to be conducted as part of these agronomic trials

# Clark's Farm



**Property Size: 97 ha**

**Undergraduate teaching**

**Main area of research:**

Soil science, sheep production

**Infrastructure:**

Soil pits

**Used to support undergraduate teaching, Clark's Farm provides a real-world field site to study soils.**

Joining the main UNE campus on the eastern and northern side, Clark's Farm is predominately used to support undergraduate teaching by providing a real-world field site to study soils within the context of a commercial sheep property. With a range of soil types across the property, Clark's Farm has excavated soil pits to illustrate the different types and the different horizons throughout the soil profile.

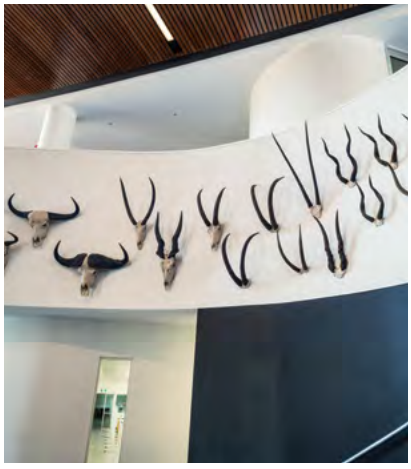
With areas of cultural significance including a quarry, Clark's Farm also provides opportunity for archaeological research.

# Research Infrastructure

## World class research laboratory facilities

UNE has a comprehensive list of world class research facilities, including:

- Chromatography Laboratory
- Environmental Analytical Research and Carbon Laboratories
- Fibre Measurement Laboratory
- X-ray Laboratory
- Land Use, Planning and Management Laboratory
- Limnological Equipment and Laboratory
- Meat Science Laboratory
- Ecology Laboratories
- Plant and Soil Laboratories
- Wildlife Resources Laboratory
- Water Resources Laboratory

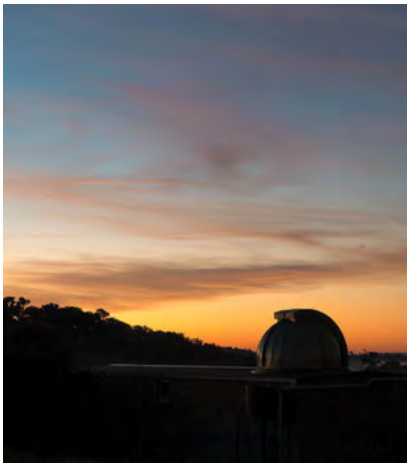


## Agricultural Education Building

The new Agricultural Education Building is a hub for many exciting cross-disciplinary collaborations combining research, teaching, and community outreach and engagement. The facilities include high quality, multi-purpose teaching laboratories, as well as sound-proofed and temperature controlled work rooms for researchers and students. The building also offers the latest technologies to equip graduates in today's competitive knowledge economy.

## Greenhouse and Glasshouse Complex

The UNE Greenhouse Complex has two specialised greenhouses. Greenhouse 1 established in 2009 has 13 bays of controlled temperature to meet subtropical and tropical conditions. It also has plant growth light in each bay to increase day length. Individual bays are controllable to 10-35 degrees. 2 of the bays have capacity to receive $CO_2$ from an external source. Greenhouse 2 is a Poylcarb with 12 bays of controlled temperature to meet subtropical and tropical conditions. Watering systems are available to be fitted by individual researchers and 2 of the bays have capacity to receive $CO_2$ from an external source. There is a range of plant growth cabinets with a temperature range of 6 to 40 degrees. Other facilities include plant tissue culture facilities, plant and soil drying and grinding facilities, shade house.



## Kirby Observatory

Used primarily as a teaching and amateur astronomy site, the kirby observatory holds basic astronomical equipment including the webster telescope a 14-inch (35 cm) diameter schmidt-cassegrain telescope and multiple 10-cm refractor telescopes.

The UNE and Northern Tablelands Amateur Astronomy Society are a community group of enthusiastic amateur astronomers that use and maintain this equipment along with using their own equipment to take astronomical and solar measurements including images and the optical spectra of astronomical objects.

## NCW Beadle Herbarium

The NCW Beadle Herbarium (NE) at UNE includes c.100,000 vascular plant specimens, housed in a purpose-built facility with excellent stereomicroscopes and specimen imaging equipment. The facility is a vital resource for systematists, ecologists and agricultural scientists as it provides data going back more than 100 years on habitat characteristics and Herbarium NE was the first university-only herbarium to deliver data to Australia's Virtual Herbarium and Atlas of Living Australia (c. 83,000 records from 2013). Herbarium NE is internationally recognised and is able to exchange specimens with, borrow from, and lend to other recognised herbaria. For more details and contacts please look on our website; **www.une.edu.au/about-une/academic-schools/school-of-environmental-and-rural-science/facilities/ncw-beadle-herbarium.**

UNE also has a suite of high-end imaging equipment from low magnification to high magnification microscopy, SEM, and micro CT-scanning.

## The Natural History Museum

The UNE Natural History Museum is a library of life; a place of activity, interaction and discovery.

The Museum displays specimens from the world around us – and around the globe. This material has been acquired over decades, primarily driven by scientific research within the University, but also through donations and particular interests of individual staff members. As in most museums the specimens on display represent a tiny portion of the vast holdings. The remainder, cared for in storage, are preserved and conserved as a significant University resource for teaching, research, future testing and reference material for comparative purposes.

# The Centre for Animal Research and Teaching (CART)

**The Centre is comprised of a significant number of state of the art integrated animal housing and handling facilities with allied laboratories that are dedicated to supporting animal research and teaching at UNE.**

These are located within the CART precinct on the main UNE campus as well as on three of the SMART Farms, and they are actively supported by a team of skilled technical staff, the UNE veterinarian/ animal welfare officer and management. Animals that can be accommodated include cattle, sheep, goats, poultry, laboratory animals, pigs, wildlife and dogs. All animal research and teaching conducted in CART is overseen by the UNE Animal Ethics Committee and the animals and facilities are regularly monitored to ensure welfare standards are maintained at the highest possible level.

The research facilities also include a fully equipped feed mill to produce custom diets, surgery, recovery room, post-mortem room, climate controlled rooms and buildings, laboratories, sample preparation areas, freezers, cool rooms, temporary office space, student breakout area, tea room and small replicated paddocks with handling facilities for field work. In addition, PC2 capacity and specialised equipment such as a CT scanner, SEM, blood/ gas analyser and net energy chambers (poultry, sheep & cattle) are available within the precinct. As such, the Centre is able to support a wide variety of research interests with a current emphasis on animal production, welfare, behaviour, nutrition, methane emission reduction, parasitology, biomedical research and specific diseases of livestock and poultry.

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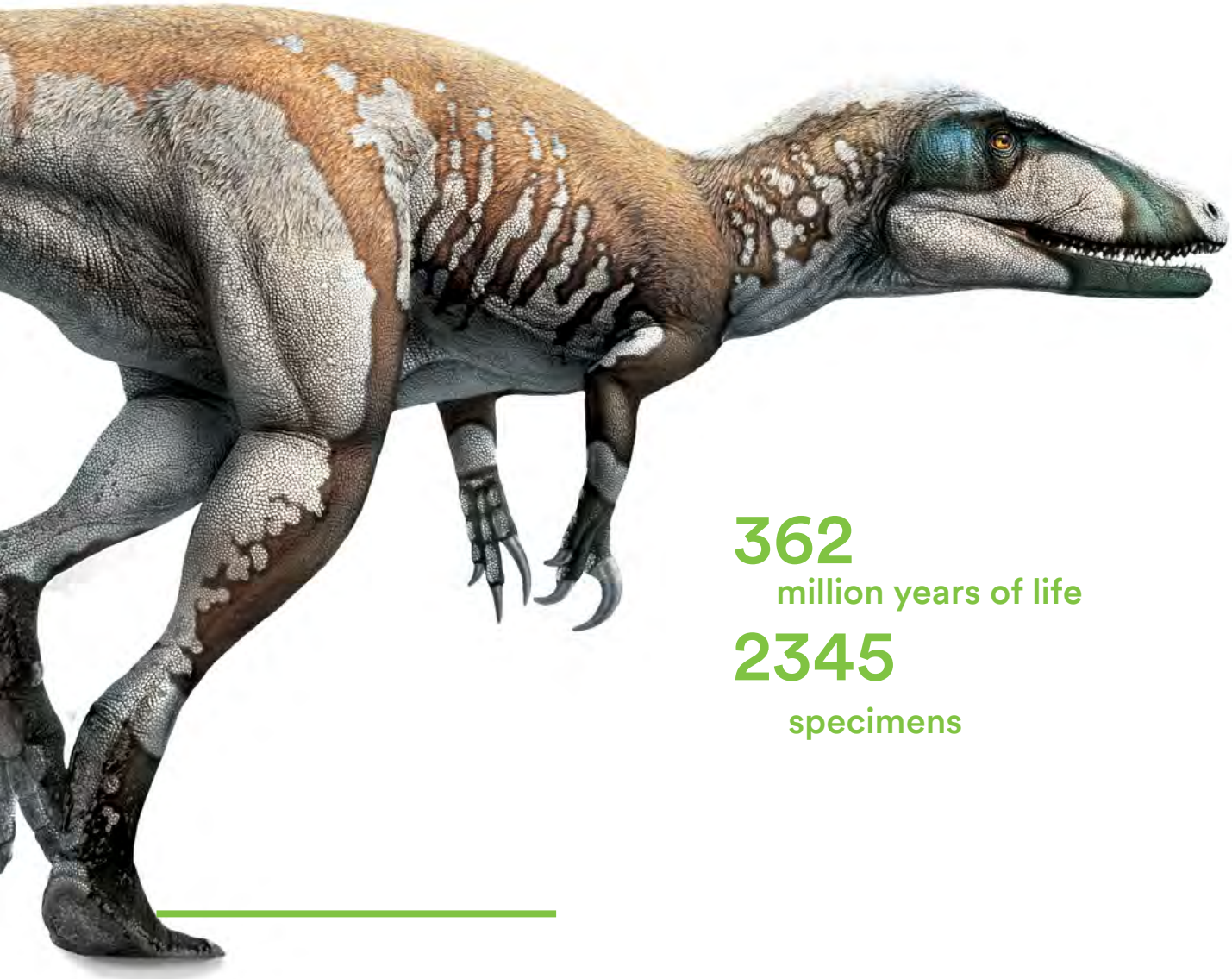
NATURAL HISTORY MUSEUM

# Natural History Museum

## The Natural History Museum puts on public display the work of many years of collecting and curating by several generations of researchers.

Not all of the collection can be shown, and thousands of items remain in the archives, but this Museum gives UNE a place to display a significant portion of the collection in a way that gives the pieces context and meaning.

UNE Natural History Museum is open to the public Monday - Friday
**unenaturalhistorymuseum.org.au**



**362**
million years of life

**2345**
specimens

## The Natural History Museum is an important project in the evolution of the University of New England.

Through the Natural History Museum, UNE is able to present the collection for anyone with an interest in how nature works (or the potentially much larger audience for creepy dead things).

At another level, the Museum represents a physical introduction to the work of the University, and its neverending quest for understanding. Behind each specimen sits layers of story — why and how the specimen was collected, how it contributed to research, what the creature itself represents in a world where too much of life is vanishing too fast.

It is also a reminder that there is no surrogate for real things. The most sophisticated computer graphics cannot replace the sense of wonder that comes with viewing the still remains of real animals, in all their extraordinary variety.

This is a first step in a plan to bring UNE's assets - antiquities, art, rocks and other things collected over the years - out of the vault to be made readily accessible to the public.

The UNE Natural History Museum collection comes from far and wide. While predominantly from Oceania and the Americas, some specimens originate from Madagascar, Antarctica and Greenland. Botanical, zoological and geological treasures have been meticulously curated over the past 30 years by academics and enthusiasts, gathering and trading specimens between universities and museums all over the world.

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NATURAL HISTORY MUSEUM

### 362 Million years of life

Our collection comes from far and wide. While predominantly from Oceania and the Americas, some specimens come originate from Madagascar, Antarctica and Greenland. Botanical, zoological and geological treasures have been meticulously curated over the past 30 years by academics and enthusiasts, gathering and trading specimens between universities and museums all over the world.

### Research & Testing

As in most museums the specimens on display represent a tiny proportion (5%) of the vast holdings. The remainder, cared for in storage, are preserved and conserved as a significant University resource for teaching, research, future testing and reference material for comparative purposes.

### Lightning Claw

The UNE NHM is a distinctly modern exhibition space, dominated by one of Australia's newest dinosaurs named 'Lightning Claw'. This one of a kind sculpture is a reconstruction of a new megaraptor species discovered in opal rubble at Lightning Ridge by UNE researcher Dr Phil Bell and colleagues.

### The value of our specimens

Specimens and the crucial documentation that resides along-side them; telling us where, when, how and who collected them, become a reference for identification, comparison and education. Museums in the 21st century are places of activity, interaction and discovery. Installations help visitors to see patterns in nature, evolution and encourage evidence and object based learning.

### The art of taxidermy

Taxidermy has had a revival of sorts in recent years. While the exhibits of the Natural History Museum in New York and London show world class examples of this trade, our own University has not been without its skilled preparators. Their work is celebrated and acknowledged here in our new space.

### Geology collection

Two storage rooms hold the geology teaching and research collection, with the collection consisting of:

- **83,000+** research samples
- **10,000+** fossil samples
- **2,000+** mineral samples
- **1,000+** ore deposit samples

# International

## Our researchers and students often travel to exciting and exotic places to undertake their research and teaching.

**To achieve global food security in our changing world, agricultural production will need to increase by 50% over the next 40 years.**

To achieve this goal, whilst maintaining our natural environments and biodiversity, will be an enormous challenge, as will be adapting to climate change. Meeting these challenges lies within the specialised expertise of the Faculty's staff.

The Faculty has a strong international presence, leading many international projects in research, consultancy, and customised training, in a wide variety of countries in Asia, the Pacific, and Africa.

The Faculty has a strong international presence, leading many international projects in research, consultancy, and customised training, in a wide variety of countries in Asia, the Pacific, and Africa. Much of our work is in international development, working across the world to accelerate agriculture development, improve livelihoods of poor farmers and protect the world's environment.

We have students from over 60 countries enrolled at UNE. International students particularly like the multicultural nature of UNE, the relaxed Armidale lifestyle, the beautiful natural environment, and the excellent support they receive from UNE staff throughout their degrees.

We deliver many international capacity development training programs, in Australia and overseas, focusing on driving change in agriculture and environment systems, improving gender equity, growing management and leadership skills and supporting emerging researchers. Search Facebook and other social media channel for uneicb to learn more about our capacity building programs.

une
International Development

# Postgraduate Scholarships

## For Postgraduate Research, the University of New England offers a range of specific scholarships both to domestic and international students.

**These include:**

- Australian Government Research Training Program (RTP) (Domestic and International)
- UNE International Postgraduate Research Award (IPRA)

Postgraduate research scholarships provide a living allowance and tuition fees for high-quality research higher degree students. Scholarships are open for competitive applications twice a year and are awarded on academic merit and research experience and/or potential. For more detail, dates of application rounds, eligibility criteria etc.
**une.edu.au/research/hdr/hdr-scholarships**

**Stipend:**

Postgraduate research scholarships currently have a fixed rate value of AUD$35,411 per annum , tax free for full-time candidates. The maximum duration of these scholarships is 3.5 years for doctoral degrees and 2 years for research Masters.

Full details of the postgraduate application process can be found at: **une.edu.au/research/hdr/how-to-apply-for-postgraduate-research-courses**

Details of eligibility, conditions, application process etc. for each of these can again be found at: **une.edu.au/research/hdr**

# Indigenous Higher Degree Research (IHDR) Scholarships

**The Deputy Vice Chancellor (Research) is now accepting applications from Aboriginal and Torres Strait Islander people seeking to undertake a Higher Degree by Research at The University of New England.**

Aboriginal and Torres Strait Islander Scholarship applications are accepted all year and valued at **$41,849.00 p.a** (2024) for three and a half years for a Doctoral degree; or two years for a Research Masters.

In addition, candidates will be eligible to apply to Graduate Research School for an additional **$7,000.00** per year for cultural supervision and/or mentoring funds.

Full details of eligibility, conditions, application process etc can be found at:

**une.edu.au/research/hdr/hdr-scholarships**

## Vanessa Sewell

# Indigenous researcher

**Vanessa Sewell is a proud Worimi woman from the Mid North Coast of New South Wales.**

Vanessa has always had a strong passion for animals and initially aimed to study Veterinary Science. To pursue this goal, she enrolled in a Bachelor of Animal Science at the University of New England as an entry pathway.

Vanessa completed her degree off-campus, studying online while living in various locations such as Pacific Palms, Sydney, and Brisbane, all while working part-time. During her degree, she engaged in the practical component at a veterinary clinic in Forster. It was during this time she decided that, despite her passion for animal health and welfare, she would not pursue a career as a vet.

To explore other career opportunities, Vanessa completed her Honours in 2019 with a small project focused on a livestock vaccine development. Her Honours research ignited her passion for research and allowed her to combine her interests in animal welfare and health. This led her to begin her PhD in 2020, focusing on a larger livestock vaccine development project aimed at creating a biotechnological solution for an effective livestock vaccine against important parasites.

During her PhD, Vanessa has achieved several significant accomplishments. She won the UNE Three Minute Thesis Competition for the School of Science and Technology and received the Sally Muir Agricultural Postgraduate Award, which recognises excellence in agricultural research.

In addition to these awards, Vanessa was also a recipient of the National Aboriginal and Torres Strait Islander Science Award from the Australian Academy of Science and UNE's Keith and Dorothy Mackay Travelling Scholarship in 2022. This scholarship enabled her to do a laboratory secondment in Scotland, visiting Glasgow University and the Moredun Research Institute, and presenting her work at the International Congress of Parasitology (ICOPA XV) in Denmark. This experience allowed Vanessa to make invaluable connections and travel internationally for the first time. As a recipient of the Academy of Science Award, she was also invited to attend the Prime Minister's Science Awards in 2022.

Since beginning her PhD, Vanessa has had numerous opportunities to build her academic career. She currently lectures in UNE's TRACKS Tertiary Preparation Program, teaching and supporting Indigenous students to help them enter their undergraduate degrees. Vanessa also lectures in OORA200/400 Working with Aboriginal People, where she delivers lectures on the history of Aboriginal People and cultural competency, a topic she is very passionate about.

Vanessa is on track to complete her PhD by the end of 2024.

# Current Research Supervisors ERS

## Environmental & Rural Science

### Animal Science

**Dr Jamie Barwick**

Senior Lecturer - Precision Agriculture Research Group (PARG)

une.edu.au/staff-profiles/precision-agriculture-research-group/dr-jamie-barwick

**Professor Samuel Clark**

Professor in Animal Genetics

une.edu.au/staff-profiles/ers/sclark37

**Associate Professor Fran Cowley**

Associate Professor - Livestock Production

une.edu.au/staff-profiles/ers/fran-cowley

**Dr Emma Doyle**

Senior Lecturer in Animal Science (Sheep and Wool)

une.edu.au/staff-profiles/ers/edoyle3

**Professor John Gibson**

Professor, Associate Dean International

une.edu.au/staff-profiles/ers/jgibson5

**Professor Lewis Kahn**

Professorial Research Fellow - Professor Livestock System

une.edu.au/staff-profiles/sabl/lkahn3

**Dr Emma Lynch**

Lecturer in Ruminant Production

une.edu.au/staff-profiles/ers/emma-lynch

**Associate Professor Peter McGilchrist**

Associate Professor in Meat Science

une.edu.au/staff-profiles/ers/peter-mcgilchristu

**Dr Kosar Gharib-Naseri**

Lecturer in Poultry Nutrition

une.edu.au/staff-profiles/ers/kosar-gharib-naseri

**Dr James Preston**

Lecturer in Sheep and Wool

une.edu.au/staff-profiles/ers/james-preston

**Dr Amy Tait**

Lecturer in Animal Science

une.edu.au/staff-profiles/ers/amy-tait

**Dr Kara Tighe**

Lecturer in Agricultural Economics and Consulting

une.edu.au/staff-profiles/ers/kara-tighe

**Dr James Turnell**

Lecturer and Senior Technical Officer (Lead) Animal Science

une.edu.au/staff-profiles/ers/dr-james-turnell

**Professor Julius Van der Werf**

Professor in Animal Genetics

une.edu.au/staff-profiles/ers/jvanderw

**Dr Dominic Waters**

Associate Lecturer in Quantitative Genetics and Genomics

une.edu.au/staff-profiles/ers/dominic-waters

**Associate Professor Janelle Wilkes**

Associate Professor

une.edu.au/staff-profiles/ers/jwilkes2

**Professor Shubiao Wu**

Professor - International HDR Pathways and Projects

une.edu.au/staff-profiles/ers/swu3

**Further information** on these research opportunities and others, please email our higher degree resource office in the School of ERS: **ers-hdr@une.edu.au**

Visit our Faculty homepage: **une.edu.au/about-une/faculty-of-science-agriculture-business-and-law/school-of-environmental-and-rural-science**

## Plant, Soil and Environment

**Dr Onoriode Coast**

Senior Lecturer in Crop Science
une.edu.au/staff-profiles/ers/onoriode-coast

**Associate Professor Richard Flavel**

Associate Professor of Crop Science
une.edu.au/staff-profiles/ers/rflavel3

**Associate Professor Chris Guppy**

Associate Professor in Soil Fertility
une.edu.au/staff-profiles/ers/cguppy

**Associate Professor Paul Kristiansen**

Associate Professor, Food Systems and Rural Development
une.edu.au/staff-profiles/ers/pkristi2

**Associate Professor Lisa Lobry de Bruyn**

Associate Professor in Soil Health and Knowledge Sharing
une.edu.au/staff-profiles/ers/llobryde

**Dr Jonathan McLachlan**

Lecturer in Pasture Science and Grazing Management
une.edu.au/staff-profiles/ers/jonathan-mclachlan

**Dr Ivanah Oliver**

Lecturer in Soil Science
une.edu.au/staff-profiles/ers/ivanah-oliver

**Dr Toni Petronaitis**

Lecturer of Plant Pathology and Crop Protection
une.edu.au/staff-profiles/ers/toni-petronaitis

**Professor Brian Sindel**

Professor of Weed Science
une.edu.au/staff-profiles/ers/bsindel

**Professor Matthew Tighe**

Professor of Ecosystem Modelling
une.edu.au/staff-profiles/ers/mtighe2

**Professor Brian Wilson**

Professor in Terrestrial Carbon Management
une.edu.au/staff-profiles/sabl/bwilso24

**Professor Susan Wilson**

Professor in Environmental Pollution
une.edu.au/staff-profiles/ers/swilso24

# Current Research Supervisors ERS

## Environmental & Rural Science

### Life, Earth and Environment

#### Botany

**Associate Professor Rose Andrew**

Associate Professor in Plant Molecular Ecology

une.edu.au/staff-profiles/ers/randre20

**Dr Adrienne Burns**

Senior Lecturer in Biological and Environmental Science

une.edu.au/staff-profiles/ers/aburns

**Dr Davic Perović**

Lecturer in Community Ecology

une.edu.au/staff-profiles/ers/david-perovic

**Dr Andrew Thornhill**

Lecturer in Plant Systematics, Director of the N.C.W. Beadle Herbarium

une.edu.au/staff-profiles/ers/andrew-thornhill

#### Earth Science

**Associate Professor Phil Bell**

Associate Professor in Earth Sciences (Palaeontology)

une.edu.au/staff-profiles/ers/pbell23

**Dr Marissa Betts**

Senior Lecturer in Earth Sciences

une.edu.au/staff-profiles/ers/marissa-betts

**Dr Nicolas Campione**

Senior Lecturer in Earth Sciences (Palaeontology)

une.edu.au/staff-profiles/ers/dr-nicolas-campione

**Dr Timothy Chapman**

Senior Lecturer in Earth Sciences

une.edu.au/staff-profiles/ers/timothy-chapman

**Dr Luke Milan**

Senior Lecturer in Earth Sciences

une.edu.au/staff-profiles/ers/lmilan

**Dr Ria Mukherjee**

Lecturer in Earth Science

une.edu.au/staff-profiles/ers/ria-mukherjee

**Professor John Paterson**

Professor of Earth Sciences (Palaeontology)

une.edu.au/staff-profiles/ers/jpater20

**Dr Nicholas Tailby**

Lecturer in Geology

une.edu.au/staff-profiles/ers/nicholas-tailby

**Further information** on these research opportunities and others, please email our higher degree resource office in the School of ERS: **ers-hdr@une.edu.au**

Visit our Faculty homepage: **une.edu.au/about-une/faculty-of-science-agriculture-business-and-law/school-of-environmental-and-rural-science**

## Zoology

**Associate Professor Debbie Bower**
Associate Professor in Ecosystem Rehabilitation
une.edu.au/staff-profiles/ers/debbie-bower

**Dr Zenon Czenze**
Lecturer in Vertebrate Zoology
une.edu.au/staff-profiles/ers/zenon-czenze

**Dr Heidi Kolkert**
Lecturer in Zoology
une.edu.au/staff-profiles/ers/heidi-kolkert

**Dr Tommy Leung**
Lecturer in Parasitology & Evolutionary Biology
une.edu.au/staff-profiles/ers/tleung6

**Professor Paul McDonald**
Professor in Animal Behaviour
une.edu.au/staff-profiles/ers/pmcdon21

**Dr Anna Frances Probert**
Lecturer in Entomology and Pest Management
une.edu.au/staff-profiles/ers/anna-frances-probert

**Professor Stephen Wroe**
Professor in Evolutionary Biology
une.edu.au/staff-profiles/ers/swroe

## Ecosystem Management

**Associate Professor Guy Ballard**
Associate Professor in Ecosystem Management
une.edu.au/staff-profiles/ers/guy-ballard

**Associate Professor Bradley Evans**
Associate Professor of Remote Sensing and Earth Observation
une.edu.au/staff-profiles/ers/bradley-evans

**Dr Brooke Kennedy**
Lecturer in Anthrozoology and Indigenous Knowledge
une.edu.au/staff-profiles/ers/brooke-kennedy

**Dr Sarah Mika**
Senior Lecturer in Aquatic Ecology
une.edu.au/staff-profiles/ers/smika

**Dr Eric Nordberg**
Senior Lecturer - Applied Ecology and Landscape Management
une.edu.au/staff-profiles/ers/dr-eric-nordberg

**Dr Romina Rader**
Professor (Research) in Community Ecology
une.edu.au/staff-profiles/ers/rrader

**Dr Manu Saunders**
Senior Lecturer in Ecology and Biology
une.edu.au/staff-profiles/ers/manu-saunders

**Dr Priyakant Sinha**
Lecturer in Spatial Science - Applied Agricultural Remote Sensing Centre
une.edu.au/staff-profiles/aarsc/priyakant-sinha

**Dr Rhiannon Smith**
Senior Lecturer in Environmental Management
une.edu.au/staff-profiles/ers/rsmith66

**Professor Karl Vernes**
Professor of Wildlife Ecology and Conservation Biology
une.edu.au/staff-profiles/ers/kvernes