



LINCOLN
UNIVERSITY
TE WHARE WĀNAKA O AORAKI

Lincoln University

SDG Report 2021



Research Management Office
NOVEMBER 2022

Introduction

Te Whare Wānaka o Aoraki Lincoln University exists to facilitate excellent research and education, to grow the knowledge of our students and to help shape a world that benefits from a greater understanding of the relationships between land, food and ecosystems.

As New Zealand's only specialist land-based university, Lincoln is unique among tertiary Institutions. At the heart of Lincoln University's teaching, research and leadership is a commitment to ensuring future generations can flourish and grow.

In 2021 we proudly launched our Sustainability Plan, underpinning our commitment to being an exemplar of sustainable practices for the land-based sector and the ecosystems within it.

This plan is ambitious but is reflective of our commitment to a more sustainable, resilient and prosperous future for the land-based sector.

The plan highlights our two key goals: to be sector leaders in education, research and demonstration of sustainability, and to be carbon neutral by 2030, and well on the way to carbon zero by 2050. Further to our commitment, our Sustainability Plan focuses on four themes: our education, research, demonstration and campus environment.

UN Sustainability Development Goals (SDGs) underpin everything that we do at Lincoln University, and this report touches on some of our successes in support of the SDGs. While our programmes are diverse, as a specialist land-based university we do not attempt to offer everything, choosing to focus our resources in the areas we truly excel. Yet we proudly cover the full spectrum of all 17 SDGs.

This is our first SDG report and sets a strong platform to build on as we continue our journey towards being an exemplar of sustainable practices for the land-based sector.



Te Whare Wānaka o Aoraki Lincoln University's commitment to the SDGs

[The 2030 Agenda for Sustainable Development](#), adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries – developed and developing – in a global partnership.

They recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Universities worldwide are acting as catalysts and role models for sustainable development, and Aotearoa New Zealand's eight universities have unanimously resolved to work together and with other sectors – specifically central and local government, civil society, the private sector and youth – to show leadership in the implementation of the SDGs at a national level.

This includes a commitment to hosting a series of national SDG Summits that aim to promote, build and accelerate multi-sector action to implement the UN's SDGs in Aotearoa.

Lincoln University was proud to co-host the 2020-2021 Aotearoa Sustainable Development Goals Summit Series with the University of Canterbury. Due to COVID, the event had to move online.





END POVERTY IN ALL ITS FORMS EVERYWHERE

Reducing poverty through inclusive and sustainable growth of the rural economy

The [Lincoln University Centre for International Development](#) (LUCID) undertakes research and provides research-based consulting services to support international development.

The centre focuses on the management of agricultural and natural resources in developing and transitioning countries so that poverty can be reduced through inclusive and sustainable growth of the rural economy. It facilitates Lincoln University staff involvement in long-term development projects with a research or education focus, and in short-course training both in New Zealand and abroad. LUCID also provides a focal point for postgraduate students studying development and is a destination for visiting scholars specialising in development.

Myanmar Project delivers best practice models for pro-poor rural development

In 2017, Lincoln University partnered with World Vision NZ, World Vision Myanmar, Vision Fund Myanmar and the International Livestock Research Institute to create sustainable value chains for agricultural products grown on small farms in Myanmar's poor and isolated Tanintharyi region. In 2021, Lincoln University researchers released innovative contracts and inclusive business model templates that can be applied by rural development practitioners to similar contexts.

[The Myanmar Project](#) highlights:

- Lincoln's action research delivered 20 functional producer groups (PGs) with a combined membership of more than 800 smallholders
- These PGs contracted members to produce high-quality paddy seed and hybrid pigs, purchased inputs in bulk, negotiated innovative supply contracts with premium buyers, invested in machinery and equipment to provide land preparation and transport services, and, in some instances, managed domestic water services and lobbied successfully for road improvements
- In the space of just one year, 17 PG members established pig breeding farms and more than 700 high-quality hybrid piglets were bought and fattened by other PG members. All these farmers adopted good agricultural practices and biosecurity protocols monitored by the PGs
- Microfinance branches established by the project in Myeik and Palaw were self-sustaining by mid-2019. By October 2021 they had accumulated 14,132 clients (87% women) and a loan portfolio of NZD 21.8 million.

Changing the world through business

The Lincoln University Yunus Centre for Social Business, established in 2017, is the first Yunus Centre to be set up at a New Zealand university. The Yunus social business centres were started by Nobel laureate Professor Muhammad Yunus, founder of the Grameen Bank in Bangladesh, which helps alleviate poverty, through microfinancing and lending to the country's poor without the need for collateral.

In 2021 Lincoln University introduced a [new Social Entrepreneurship course](#) to give students the skills to address social issues through innovative business ideas. [Dr Ani Kartikasari](#) is behind the new Social Entrepreneurship course for third-year Lincoln University students.

Case studies of individual social entrepreneurs and examples of social enterprises are studied in the course, while professionals from a range of industry sectors are invited to present as guest lecturers on relevant and topical issues.



Unlike a charity, a social business is set up to solve a specific problem to the benefit of poor or disadvantaged members of society. The business can generate a profit and aim to be financially self-sustaining. Social entrepreneurship can improve both society and environmental wellbeing, particularly in the rural sector of developing countries, from community-based eco-tourism, micro-entrepreneurship, value-adding activities and poverty alleviation projects.

Support for students during the pandemic

Keeping the Lincoln community safe in the environment in which we teach, learn, work and research remained a priority for the University. The University also worked together with the Lincoln University Students' Association (LUSA) to support students impacted by COVID-19 in 2021. While face-to-face teaching activities continued under the New Zealand Public Health Response Alert Level Requirements 1 and 2, all course materials were made available online. Throughout the year the University continued to actively reach out to all its students to provide health, wellbeing and pastoral care, including financial assistance and technology support.

During 2021 the Hardship Fund for Learners (HAFL) and the Technology Access Fund for Learners (TAFL) to support learners to continue to access tertiary education and training that

has been disrupted due to COVID-19 were combined into one fund, with the majority of funding available – \$63 998 to the University for its students – distributed by the end of the year. LUSA also provided support through the Financial Assistance Fund for students who were experiencing unexpected financial issues. The University's Wellbeing and International Support and Chaplaincy Services managed a foodbank which had a range of toiletry, cleaning and food products, as well as winter clothing.



Scholarships help students to reach their potential

There is an [extensive list of scholarships](#) available to Lincoln University students each year which allows them to study while covering all or some tuition costs and/or living costs, enabling students to take up new challenges and experiences which may not otherwise be available.

Addressing rural poverty through coffee-related agritourism initiatives

Tourism management and development researcher, Dr [Gebeyaw Degarege](#), [investigated the socio-economic benefit of coffee tourism in Ethiopia](#). With Ethiopia the birthplace of coffee, there is potential to address rural poverty through coffee-related agritourism initiatives. The results of the exploratory study were published in 2021. While the country uses coffee to assist its destination marketing strategies, coffee is not yet a primary tourism product and coffee growers have no understanding of how tourism could add value to their livelihoods. Dr Degarege examined key governance-related obstacles and identified policy and practice interventions that could help integrate the agricultural and tourism sectors to improve socio-economic wellbeing.

Empowering women in Uganda



The [Lincoln University Blues and Golds Awards](#) recognise students who have shown determination to succeed, willingness to embrace personal growth and generosity in their contributions to society. Among the 2021 Gold winners was Lincoln University student Dorah Ayaa, who has empowered women in Uganda by improving financial literacy and providing market access for their dairy products, leading to poverty reduction and improved income levels.

All of Dora's activities are operational under the women of peace foundation which is an organisation that focuses on teamwork, peace and reconciliation after 26 years of war and political unrest in northern Uganda. These initiatives have advanced the level of education access of children per household, improved family nutrition and health, and enhanced the general living standards of these participating women.

Agricultural Cooperatives provide services to household welfare

Professor [Christopher Gan](#) has supervised a body of work on the [impact of microfinance programs and agricultural cooperatives on poverty alleviation in Thailand](#). His students have found that Agricultural Cooperatives' services play important roles in improving household welfare. While both credit and marketing services exhibit significant positive effects on household and farm income, marketing services are more effective in improving household welfare.

However, credit considerably increases household consumption and the adoption of improved farm technologies and practices. Microfinance programmes only help households that have the necessary level of education. The research suggests the government should provide social programmes and business skills for these households and completion of such courses should be a pre-requisite for accessing microfinance programmes.



END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

Food transitions 2050 – Joint Postgraduate School

Food Transitions 2050 is a new joint postgraduate school, comprising a multilateral partnership between five Canterbury-based research organisations. It is a first for Aotearoa New Zealand and will play a critical part in attracting and growing talent in the land-based sector.

Focused on transitioning regional, national and international food systems into a more sustainable future, the school complements existing food innovation initiatives and has already welcomed its inaugural cohort of 14 postgraduate students at the start of 2021. [Food Transitions 2050's](#) core purpose is to support the transition to more sustainable, future-focused food systems and preparations in Aotearoa New Zealand and beyond. PhD students enrolled at either Lincoln University or the University of Canterbury, with co-supervision by researchers at one or more Crown Research Institutes (CRIs). Regardless of their home institution, all students interact as a cohort through seminars and workshops to develop non-academic skills.

Research projects are organised within an integrative transdisciplinary framework, where student researchers learn from each other, as well as their supervising academics, to enhance their collective experience and skill in interdisciplinary work. In their final year, students get work experience through placements to ensure that they are 'work ready' when they graduate.



Lincoln University's research, demonstration and teaching farms

Lincoln University farms are crucial to its practical scientific research and engagement with the agricultural sector. The farms develop and demonstrate world best agricultural practices, undertake environmental monitoring, conduct research into forage and herbage, test approaches to becoming carbon-neutral and predator-free and achieve complete recycling of nutrients while increasing productivity and minimising environmental impacts.

The University's research farms can take on a higher level of risk than is acceptable to most farmers when testing new projects and finding new ways to operate. Regular demonstration days are held for commercial farmers to take key learnings to apply to their own properties.

In 2021 [Lincoln University Dairy Farm \(LUDF\)](#) launched three new farm systems initiatives at its demonstration farm, all geared towards sustainable dairy farming practices. LUDF is operated by the South Island Dairying Demonstration Centre (SIDCC), an industry-funded partnership between Lincoln University, DairyNZ, Ravensdown, SIDE, LIC and AgResearch. The new systems expand LUDF's focus and extend its outlook through to 2030. They include introducing more flexible milking times, moving the forage base to include plantain, and lowering the replacement rate of heifers. The revised LUDF farm systems aim to effectively contribute to New Zealand dairying and the wider primary sector.



LUDF is a 186-hectare demonstration dairy farm outside the Lincoln township. It aims to maximise sustainable, profitable farming by optimising productivity, environmental footprint and animal welfare targets. The farm's systems, operations and performance are shared through focus days, reports and weekly farm walk notes, and are freely accessible to everyone.

Both LUDF and the Ashley Dene Farm have received A ratings in their regular environmental and sustainability audits by the Canterbury Regional Council, which is only awarded to the top 5% of farms. The Lincoln University Dairy Farm is in the top 3% for profitability.

[Lincoln gene lab trio recognised with Primary Industries Awards](#)

The work of three members of Lincoln University's Gene-Marker Laboratory was recognised in the [2021 Primary Industries Awards](#). Lab director Professor Jon Hickford, principal researcher Dr Huitong Zhou and lab manager Freeman Fang were given the Science and Research Award at the ceremony in 2021, in recognition of their work to breed healthier, more resilient livestock.

The judges were impressed with the holistic approach of the Lincoln University team, who brought a highly professional genetic approach to the business of farming. Their relationship with farmers guarantees a practical result from a highly specialised scientific process. The lab's main research focus is genetic variation in ruminants, particularly in sheep, but also cows, and its association with economically important traits. It has developed a test for genes, which underpin milk, meat and wool production, and make livestock resilient to disease and

environmental challenges, identifying superior animals. It also tests for A1 and A2 milk in dairy cattle, diseases such as foot rot, and environmental resilience traits like cold tolerance and improved intra-muscular fat content in meat.



Serving up sustainable food options

Lincoln University is committed to providing sustainable, healthy food options on campus, including gluten-free, vegetarian and vegan alternatives. Intent on being an exemplar of sustainable practices for the land-based sector, the University is committed to demonstrating sustainability in its campus operations.

Campus cafes are open to students, staff and the public, and there is also a student dining hall, with a catering service available for events.

All campus cafes and dining facilities are certified palm oil free, use free range eggs, serve potatoes organically grown on-site by the Biological Husbandry Unit and supplied with zero packaging and low travel miles, use herbs grown on campus by the catering department, use campus-made yoghurt to avoid plastic packaging and offer affordable meals for students.

The Biological Husbandry Unit (BHU), a certified organic education and research facility based at the university, has been growing agria potatoes for the University's catering department. As part of the partnership, they are also growing taewa (Māori potatoes), which are delivered to local communities and whānau. There are plans to continue and expand the project, with the BHU looking at other organically grown crops, such as pumpkins and squash.



Research funding into future productive landscapes

In 2021 the founder of NZ Global Ecosystems Ltd, John Barnes, committed to funding a prestigious [postdoctoral fellowship at Lincoln University](#). The fellowship will allow Lincoln students to research and design more sustainable farming systems.

The postdoctoral fellowship will be based with Professor Pablo Gregorini, head of Lincoln's Centre of Excellence (CoE): Designing Future Productive Landscapes. The CoE focuses on testing and creating alternative sustainable landscape systems that embrace Mātauraka Māori, thereby building ecological health and facilitating economic, social and cultural wealth.

New Zealand depends heavily on producing agricultural products and we cannot survive if the farms that produce them are not profitable. Animals, crops and soil must be healthy, enabling a flow-on effect that creates healthy produce for humans to consume. The CoE: Designing Future Productive Landscapes is carrying out crucial research to help farmers achieve this.

Centre of Excellence - Designing Future Productive Landscapes

Lincoln University's Centre of Excellence: Designing Future Productive Landscapes seeks to explore all elements related to the future of agricultural development throughout the world while considering the sociological context for an evolving world. The CoE aims to conceptualise, design, create, implement and test alternative agroecosystems and other productive landscape systems that improve ecosystem-societal services, including timely conceptual and implementation models that embrace Mātauraka Māori from the start to support, sustain and enhance te taiao, building ecological health, economic, social and cultural wealth.

In 2021, the CoE: Designing Future Productive Landscapes hosted a virtual international workshop series that focused on cultivating a shift towards more sustainable and ethical

grazing systems. Involving presentations from experts all over the world and offering more breadth of topic coverage than any other scientific convention, the series included six weekly online workshops.

Discussions centred on re-imagining models of pastoralism in terms of 'multiscapes', including thoughtsapes (ways of thinking), landscapes (environments such as soil, water and air), foodsapes (dietary perceptions and health), socialsapes (societal demands), and wildsapes (interactions between agriculture and wildlife).

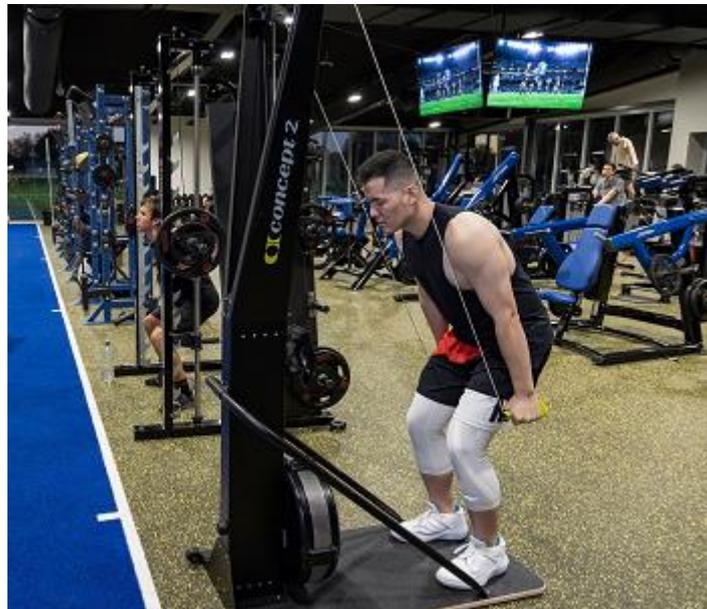


Sports grounds and recreation facilities on campus

Lincoln University's redeveloped Whare Hākinakina LU Gym was officially opened by the Minister for Sport, Hon Grant Robertson, in 2021. The gym is a thriving and vibrant wellbeing hub for Lincoln students, staff and the wider Lincoln community, and is a centre of excellence where many of New Zealand's highest-performing athletes head to sharpen their competitive edge. The biggest gym in Selwyn, it has a membership of over 2500, of which more than a quarter are community members.

The upgraded services and facilities significantly enhanced opportunities for Lincoln students to work on their fitness, increase their social connections, develop new interests and nurture their physical and mental wellbeing. Students were consulted throughout the design phase and their preferences are reflected in the new facility and revamped services on offer.

A bouldering wall, secured through a fundraising drive led by the Lincoln University Tramping and Climbing Club, a student-managed outdoor sports club, is a popular new feature.



Lincoln University offers a wide range of sporting clubs, social sports and other physical activities on campus for staff, students and the wider community. Activities include badminton, boxing for fitness, group exercise classes, social football, ultimate frisbee, indoor football, Waikirikiri Hockey partnership, rugby, netball, squash, tennis and volleyball.

The University is home to the New Zealand Cricket High Performance Centre as well as the international and first-class venue, the Bert Sutcliffe Oval. In 2021 it hosted several international cricket teams, many age-group tournaments and international warm-up matches including the National Men's Under 19, the Plunket shield and the New Zealand Cricket Under U19 Women's Teams T20 matches.

Since 1999, Lincoln has offered sports scholarships for dedicated sports people to achieve their goals on the field and court, and in the lecture theatre. Lincoln is also a member of University and Tertiary Sport New Zealand, a not-for-profit organisation that enables competition and workforce opportunities for tertiary students in sports.



Building better overall health. The role of fitness and diet.

The Lincoln Sport and Exercise Science Laboratory is a state-of-the-art facility best known for bringing athletes, coaches and scientists together to understand the mechanisms in the human body of elite athletes and how to further improve their performance. The 'living lab' offers high-tech health and fitness testing for students, staff and the community, and its varied research programme is focused on improving a range of health outcomes. The aim is to help people understand how several factors play a role in their overall health and how their fitness and diet can play a part.

The Lab works in partnership with the Whare Hākinakina LU Gym and the University's Wellbeing Team to provide follow-up support through an 'exercise is medicine' programme, where students complete 12 sessions with a personal trainer.

Participants report that having a routine of physical activity has a big impact on their mood and their ability to cope with daily stressors. They also start to appreciate the importance of the basics of wellbeing, eating well, drinking water, sleeping, socialising, getting out into nature and exercising.



[Research at the Lab in 2021](#) included using exercise to assess kidney health rather than blood tests, brain health in female rugby players with concussion, the impact of yoga on cardiovascular health in adults and the impact of yoga on rugby players. The lab is now investigating the effect of green seaweed supplements on cardiovascular and gut health, and the health benefits of grain-fed versus grass-fed beef to understand how beef quality impacts human metabolism.

Health and wellbeing support for students

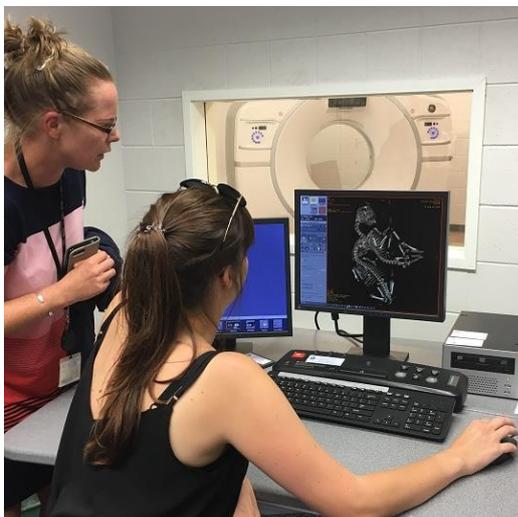
Lincoln University embraces Te Whare Tapa Whā and Five Ways of Wellbeing as well as providing educational workshops and taking part in national campaigns that promote wellbeing. Te Whare Tapa Whā is a Māori Health Model (Durie MH, 1985) with a holistic view of health and wellbeing. The model is depicted as a house, with each wall being equally and fundamentally important for our health, wellness and functioning. This also includes the land/whenua as the foundation for all wellbeing.

Educational workshops at Lincoln include:

- Exercise is Medicine is a 12-session programme, Exercise taken by a REPS registered Personal Trainer (PT). It is a client-centred approach to wellbeing that focuses on activity aspirations whilst also incorporating social, mental, physical and emotional health aspects into the sessions
- LTL Wellbeing series for postgraduate students. The series facilitates a variety of topics in short, fun 45-minute sessions throughout the year. These include thinking traps, releasing pressure, coping and acceptance, integrating activity into your day, managing sleep and managing stress
- Health promotion and national campaigns are run throughout the year by the Wellbeing Team to support students and staff in being healthy and happy.

The University is strongly committed to the health and wellbeing of all its students, including access to Student Health, a Foundation Accredited Medical Centre on campus with a team of Doctors, Nurses, Counsellors and Administrative Staff, and a dedicated Wellbeing and International Support Team.

Gene therapy by Lincoln scientists receives US FDA approval for in-human clinical trial



A [Lincoln research team](#) received US FDA approval for in-human clinical trials of their gene therapy for the treatment of CLN5 Batten disease, a fatal neurodegenerative childhood disease. The CLN5 form of Batten disease appears early in a child's life and causes brain degeneration manifesting in devastating symptoms including vision loss, seizures, dementia, abnormal movements and inability to communicate. Sufferers typically die in their teens.

Until now there has been no cure and no hope of treatment, but the Lincoln-developed gene therapy is a potentially transformative treatment for the CLN5 patient community.

Over the past decade, Professor David Palmer and Doctors [Nadia Mitchell](#) and [Samantha Murray](#) have been developing their gene therapy in sheep with a naturally-occurring form of the disease.

Sponsored by Neurogene Inc (USA), a company founded to bring life-changing genetic medicines to patients and families affected by rare neurological diseases, the Lincoln team have received US FDA approval for their Investigational New Drug Application, clearing the way for the first-in-human clinical trials of their CLN5 gene therapy.

The approved new therapy, known as NGN-101, is a one-off treatment for children with CLN5 Batten disease, whereby a functional CLN5 gene is delivered into the subject's brain and eye via an adeno-associated virus to address the neurodegeneration and vision loss associated with the disease.



The first clinical trial began at the University of Rochester (New York) in the first half of 2022, under the leadership of Jonathan W Mink MD, PhD, the Frederick A Horner MD – Distinguished Professor in Pediatric Neurology, Chief of Child Neurology and Director of the University of Rochester Batten Centre.

Reducing the incidence of skin cancer through school playground design

In a project linked to health, climate change and innovative education, the Lincoln University School of Landscape Architecture is integrating scientific information into the creative design process to produce playgrounds that protect children from climate change. Working closely with the New Zealand Cancer Society, the project arises from the [research of PhD candidate, Anupriya Sukumar](#), supervised by [Dr Wendy McWilliam](#).

It is estimated that 80% of exposure to ultraviolet radiation (UVR) occurs before the age of 18, and health impacts are set to worsen as climate change exposes children to even more UVR. While the Cancer Society has sun smart guidelines and criteria, which have been successful in getting children to wear hats and apply sunscreen, these have not reduced exposure to UVR in playgrounds. This needs to be embedded in the design process for playgrounds. It is not simply a case of providing shade. Designers need to look at the behaviour that encourages children to go into the shade, the activities that will keep them there for protection, the microclimate so that it is comfortable to stay in the shade (not too windy or cold) and reducing exposure to indirect UVR from sources such as reflective surfaces.

Using an evidence-based design approach, Landscape Architecture undergraduate and graduate students were required to improve the design of a schoolyard in Christchurch. Most students successfully developed comprehensive and professional-looking guidelines and used modelling to combine their sun-protected activities into an integrated schoolyard-wide plan, looking at how the protection provided in one zone influenced another, and how adjacent land uses may affect sun protection in a schoolyard.

Further research is being undertaken to look at sun safe design of community playgrounds and to develop guidelines for schools with the Cancer Society. MLA students are also working on the project, taking on more advanced topics, such as developing a more effective inventory and analysis methodology to evaluate existing schoolyards to determine if they need added protection from UVR, alterations in their microclimates, or more activities to attract children to play in the shade.

Grow Ōtautahi Christchurch Garden Festival

Lincoln University was a major sponsor of Grow Ōtautahi Christchurch Garden Festival, held in the Christchurch Botanic Gardens in 2021. The University's presentations, ranging from corpse flowers to virtual reality garden design to the make-up of soil, were well attended, with positive audience engagement.

Our bumblebee motels, constructed to attract the important but often underrated pollinators, were also an audience favourite. Our landscape architecture students' designs were well received, and the mystery dirt box challenge, where participants put their hands inside a box of soil and tried to guess the soil composition, was hugely popular, with contestants of all ages lining up to get their hands dirty.



Te Mātāpuna Mātātahi | Children’s University

[Te Mātāpuna Mātātahi | Children’s University](#) encourages young people aged seven to 17 to take part in innovative learning activities outside the classroom. It aims to foster a lifelong love of learning and increase young people’s aspirations for higher education. Lincoln University works in partnership with the University of Canterbury to deliver the programme, which is the first of its kind in New Zealand. Children and young people join the Te Mātāpuna Mātātahi | Children’s University programme through their school or rūnanga and are issued a Passport to Learning. They fill the passport with hours of learning outside the school classroom.



The two universities hosted a [Campus Events Experience in 2021](#) with 400 children taking part on each campus. University academics ran hands-on sessions, and facilitators from Learning Destinations also attended to offer even more opportunities.

At Lincoln, topics included 3D food printing, ecology, insects, spider webs and soil science. They had their flexibility and fitness tested in the Sports Lab and heard about life at university, as well as learning about sheep and farming.



Tasting the pasture, connecting young people to farming

Getting secondary school students to think like cows and taste the pasture is just one of the techniques used by Lincoln University's Farms Educational Facilitator, Lauren Roberts, to engage with learners. Lincoln University is now working with 160 schools to grow student and teacher interest in the important role of the primary sector.

Despite 86% of the New Zealand population living in urban environments, young people have lost their connection with farming and understanding where their food comes from.

Farming is often misunderstood, but the industry is crucial to New Zealand's future. Through schools' outreach, Lincoln University offers a range of teaching resources linked to the national curriculum and the opportunity for field trips to the Lincoln University Farms.



Free resources include unit plans, classroom activities, teaching notes, student workbooks, New Zealand case studies and You Tube exam revision. They are designed to engage with a variety of learning styles.

Subjects include pest management, sustainable dairy farming and nitrogen leaching. Agriculture, Science and Geography teachers throughout New Zealand have signed up. The aim is to make Lincoln University's knowledge accessible and to support learning that connects students with their environment.

Real-world problem-solving skills

Lincoln University is committed to providing students with opportunities to develop their real-world problem-solving skills on campus. The Living Laboratory provides an effective mechanism for students to engage with partners to explore, test and solve real-world problems relating to the land-based sector.

The Arboretum was the first project within the Living Laboratory in 2021 which included students from the Professional Practice course (SOCI 314) examining the arboretum. A tangible outcome of this project was to be able to use the arboretum as an active teaching space from 2021. This project will move into the next phase of 'Revitalising the Arboretum' going forward.



Virtual Field Trip for STAR

The University's Faculty of Agribusiness and Commerce together with the Lincoln Connected Project Team partnered with Roper and Son Limited and MG Marketing to create a virtual field trip for the Global Food Systems (MGMT106) and Sustainable Futures (Linc101) courses. This is now being offered fully online as part of our Secondary Tertiary Alignment Resource (STAR) programme. The STAR programme allows year 12 and 13 students to enrol in degree-level courses and get a head start on their tertiary learning journey

New fully online programmes

[Lincoln Connected](#) has been established to provide a technology-enabled learning ecosystem that promotes excellence and success in online education and learning.

In 2021 the University delivered six programmes fully online, with a student base of 8.8% of total student numbers against a target of 7%. As the courses that make up these qualifications are fully online, they do not require timetabled lectures. This gives students the flexibility to learn in their own time and to suit their circumstances.

A higher number of female students than males

The gender balance of Lincoln's student population for 2021 has females outnumbering males, with 53% females and 47% males, further cementing a trend that began in 2018.



Equal employment opportunities

Lincoln University provides [equal opportunity to all staff](#) regardless of a person's sex, gender, marital status, religious belief, ethical belief, colour, race, ethnic or national origins, disability, age, political opinion, employment status, family status or sexual orientation. We are committed to identifying and eliminating any institutional barriers that cause or perpetuate or tend to cause or perpetuate, inequality in respect of the employment of any person or group of persons, and all our policies and practices uphold the principle of equal employment opportunity.

Staff appointments are made solely based on merit relative to opportunity, and all promotions, advancements, salary reviews and professional/career development opportunities are based solely on merit. The University is focused on improving employment opportunities for groups who are traditionally under-represented in either occupational groups or levels of seniority, in

particular women, Māori and Pasifika people. In 2021, 50% of the Senior Management Group were women, with the same percentage of women represented on Council.

The 2021 Staff Learning and Development Programme comprised a range of courses promoting the integration of equality and diversity into the University's operations, for example, the Cultural Competence series including Understanding Unconscious Bias, Cultural Intelligence, Treaty Workshops and Leadership Sessions on a variety of topics including specific recruitment training for managers.

In terms of growing the University's Māori cultural capability, the University supported staff to attend workshops at Ngāti Moki marae, hosted by mana whenua on Ruahikihikitanga and Taumutu and Te Tiriti o Waitangi workshops. Staff were also supported and encouraged to attend short courses and degree programmes in Te Tiriti, Te Reo and Kaupapa Māori.



Gender diversity makes investments more efficient

Motivated by regulatory reforms in the UK to increase female representation on corporate boards, a Lincoln University study was the [first to investigate the effect of boardroom gender diversity on investment inefficiency](#). Other studies have shown that firms with female directors are better governed and have superior internal controls but this sample of UK-listed firms from 2005 to 2018, was the first study to provide empirical evidence on investment efficiency. The findings were that Board Gender Diversity "significantly improves investment efficiency" and "endorses the gender legislation in the United Kingdom in particular and around the world in general that increased female representation on boards to improve firm value."

Women need access to land

A recent study on the influence of land access and gender of household head on household food insecurity in Nigeria has produced policy insight for supporting gender equality and the empowerment of marginalised women in all developing countries. Lincoln researchers [Amaka Nnaji, Nazmun Ratna and Alan Renwick](#) found that female-headed households are more food

insecure than male-headed households but that only a one-acre increase in land can mitigate this. Improving access to arable land for women can enhance food security. The findings will help inform policy implementation around issues of land tenure systems, especially in societies where women face discrimination in accessing land.

New Girl Guide badge launched

In partnership with Girl Guiding New Zealand, Lincoln University launched a special badge in 2021. Called Growing The Future –

Whakatipu ngā kākano o āpōpō. Translated as 'grow the seeds of tomorrow', the badge has a science, agritech, agriculture and environmental theme with hands-on activities to encourage the girls to get outdoors and advocate for the environment.

It gives them the chance to discover a broad range of land-based careers. Aimed at addressing female leadership in the food and fibre industries, girls have been involved in activities as varied as visiting agricultural organisations, hearing from expert speakers and building lizard gardens during the process of working through the badge.



Struggles of pioneer women accountants still resonate

Research has revealed that the struggles women first faced to enter the accountancy profession may shine a light on the barriers still in place today. [Century plus journeys: using career crafting to explore the career success of pioneer women accountants](#) was co-authored by Lincoln University's [Dr Mohini Vidwans](#) and Associate Professor Ros Whiting from the University of Otago. It was published in A* journal *Accounting, Auditing & Accountability* and recounts the stories of individual women from Great Britain, the United States, Australia, Canada and New Zealand, as they attempt to gain Chartered Accountant status and enter a profession from which they have been excluded in the late 19th and early 20th centuries.



Image: Alice Basten, one of the first female public accountants in New Zealand, pictured as a member of the Auckland City Council in the 1930s. www.teara.govt.nz.

The authors said the women's stories provided insights into the more current forms of difference and discrimination operating in the accounting profession today. The proportion of female members in the accountancy professional bodies of the same countries now averages around 35–40 per cent. However, the number of female partners sits at an average of around 14–22 per cent. The accountancy profession struggles to show a diverse workforce that reflects the characteristics of the base population and to enable connection with its client base, the report stated. A career crafting matrix, developed by Dr Vidwans, was used to look at how the pioneer women enhanced their work opportunities, as well as the external factors involved.



ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

Fresh water management

The [Waterways Centre for Freshwater Management](#) was established in 2009 as a partnership between Lincoln University and the University of Canterbury. In a rapidly changing landscape of regional and national policy and decisions relating to water management, the need for coordination of research and teaching effort was clear, and it is the first such centre to be established in any New Zealand university. The Centre is the outcome of consultation with the Department of Labour, Environment Canterbury and other major stakeholders and agencies involved in water resource management and research in the Canterbury region.

The Centre now provides teaching courses and qualifications in water resource issues and their management. It maintains strong links to existing water organisations and stakeholders, to improve skills, knowledge and awareness in the water sector, and train the next generation of water resource managers.

Lincoln University research featured at the [2021 Waterways Postgraduate Student Conference](#) included an examination of the local authority standards that regulate excessive sedimentation of waterways and coastal environments from plantation forests and whether they are stringent enough, and phosphorus transport in urban streams, which helps improve strategies for monitoring and managing the nutrient burden in the Heathcote River.

Nitrate water testing

In February 2021, [Agritech Ltd offered water testing at Lincoln University](#). The community could bring samples from rural wells or rural water supply and obtain a measure of the nitrate concentrations (mg/L). The testing used HydroMetrics™, a real-time groundwater monitoring tool developed by Agritech Ltd, a research and development company owned by Lincoln University. Accurate and affordable, the HydroMetrics sensors are specifically built for environmental, agricultural and industrial use by everyday people.

The HydroMetrics sensor is specifically designed to withstand rugged outdoor environments and can be installed and remain in situ for months at a time and transmit real-time data via telemetry to any device.

New water-saving technology has a big impact on the world stage

Lincoln Agritech signed a licensing agreement with Israeli company Autonomous Pivot for a cutting-edge [new water-saving technology in 2021](#). Developed by Lincoln Agritech scientists, the technology allows farmers to see actual soil moisture in any part of a field in real-time and save water without loss of yield.

Trials have shown water savings of 25%. Autonomous Pivot is based in Israel but has taken a licence on the technology to install it onto centre pivots in the US, providing American farmers with detailed irrigation schedules to save water.

LU researchers recognised in Royal Society Te Apārangi awards



Professor Richard McDowell has been awarded the Royal Society Te Apārangi's oldest medal, the Hutton Medal, for his outstanding contributions to the knowledge of contaminant losses from land to water, and for informing environmental policy.

Professor McDowell is best known for showing how contaminants are lost from land to water, and for developing management practices to mitigate those losses. He has applied this approach to inform policy and has contributed immensely to strategies used in Aotearoa and globally to mitigate contaminant losses to water.

His keystone research work has contributed significantly to Lincoln University's role in shaping public policy and exemplifying sustainable practices for the land-based sector.

In 2021 Emeritus Professor Keith Cameron and Professor Hong Di were awarded the Pickering Medal by the Royal Society Te Apārangi for the invention of [ClearTech](#).

Professors Cameron and Di developed ClearTech, a breakthrough effluent treatment technology, in conjunction with commercial partner Ravensdown. The system uses a coagulant to bind effluent colloidal particles together to settle them out from the water. This clarifying process reduces freshwater use, helps existing effluent storage go further and reduces the environmental and safety risk linked with farm dairy effluent (FDE). Launched to market by Ravensdown in 2019, the development of ClearTech is a landmark demonstration of Lincoln University researchers collaborating with industry partners to deliver innovative new technologies with immediate and far-reaching benefits for dairy farmers in Aotearoa.



Untangling the controls on nitrous oxide emissions from braided rivers

[Dr Naomi Wells](#) was awarded Te Pūtea Rangahau a Marsden | Marsden Fund Fast-Start grant to fund her research project, which uses the unique structure of braided rivers to advance a fundamental understanding of how nitrous oxide is produced and emitted. Models currently assume nitrous oxide emissions are directly proportional to nitrogen inputs but don't account for how river hydrology can affect the rate of both nitrous oxide biological production and its physical transport from the water column to the atmosphere.



Dr Wells will use the dynamic braided river plains, which include parallel channels with low and high flows and dry gravel bars, of eight of New Zealand's culturally significant rivers as natural laboratories to test how flow controls nitrous oxide production and emission. The project will quantify, for the first time, nitrous oxide emissions from braided rivers, leading to advanced foundational climate understanding and the ability to predict emissions in a changing world.

The Lincoln University Landscape Masterplan and water on campus

Launched in 2021, [Lincoln University's Landscape Master Plan](#) includes a proposed natural systems and a sustainable drainage strategy. The strategy makes use of existing assets on or near the site and introduces several interventions to improve on-site water management and ecological functions. A network of green corridors is to be created throughout the campus. These will include planted swales and rain gardens along access routes, native vegetation beds and a core ecological zone in the centre of the campus. These zones can act as ecological anchor points for wildlife on campus. Existing water races and swales will be enhanced through planting and possible widening, increasing their ecological value as a habitat. These waterways will be connected where possible to wetlands and stormwater basins to form a network of interconnected habitats throughout the campus.

A particular strategy will include native tree planting for canopy cover, with planted swales and rain gardens as ground-level habitats. The incorporation of rain gardens and swales into the network of paved routes through campus allows for the highly valuable ability to filter runoff

and pollutants in the hardscape environment. This can be achieved along access routes where space has been gained by the removal of vehicular traffic. In car parking areas, planted swales and rain gardens can be combined with permeable paving to further reduce the number of contaminants entering the water system.





ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

Energy on campus

In 2019 Lincoln became the first New Zealand university to adopt commercial-scale solar energy generation, with the installation of solar panels on the roof of Te Kete Ika.

With the subsequent installation of two additional roof-mounted solar arrays in 2021, atop Whare Hākinakina and the new Agricultural Sciences Building, the solar installations on-campus are now delivering a total of 250,000 kWh direct to the University's network, enough to power 35 average-sized houses for a year or charge 12,500 electric cars.

In 2021 total energy used was 79,108 GJ. The total energy used from low-carbon sources was: 28,373 GJ.



Electric vehicles could change the great Kiwi road-trip

Lincoln researchers conducted research with 34 EV owners for their [2021 LEAP report](#) "[Looking beyond limitations: Electric vehicle use in New Zealand holidays.](#)"

Many of the participants had used their EVs on longer trips, from Cape Reinga to the South Island's West Coast. The research found that driving an EV can require more planning, but it

can also result in freedom from environmental guilt, freedom from having to visit petrol stations, freedom to drive a smooth, quiet, fast car, and freedom to spend more on accommodation (because travel is cheap). Most drove the more common (and cheaper) EVs and range anxiety (how long they could drive without charging the battery) was discussed, but they often noted it was a rare occurrence once they were used to their vehicle.

The study also found potential gains for the tourism industry. Future holidaymakers could get away more because of the lower costs to their bank account and the environment and could have more disposable income to spend when they get to their destination.

Lincoln University Energy Farm

The [Lincoln University Energy Farm](#) will be unique and world-first in its scale and set-up. With its aim to find and demonstrate sustainable energy solutions to support the Government's carbon reduction goals, the six-hectare Energy Farm is a partnership between Lincoln University and the Ministry for Primary Industries (MPI).

It is designed to be fossil fuel-free and will feature solar and wind power, biofuel and energy storage solutions. It will also showcase a range of technology applications, as well as yield valuable data for research and innovation. The Energy Farm is led by Drs [Wim de Koning](#) and Jeff Heyl.



Research on fuels in China

Research by Lincoln University Associate Professor Wanglin Ma and Dr Puneet Vatsahas shows that switching to cleaner fuels increases individuals' happiness and life satisfaction and self-reported health. [The study examined the impacts of cooking fuel choices in rural China.](#) Unlike previous studies, the research captured the households' fuel-stacking behaviours (using multiple fuels) by classifying cooking fuels into clean fuels, non-clean fuels and mixed fuels.

The results showed that a complete energy transition (switching from either non-clean fuels or mixed fuels to clean fuels) significantly improves individuals' happiness and life satisfaction. In comparison, incomplete energy transition (shifting from non-clean fuels to mixed fuels) does not significantly impact individuals' subjective wellbeing. They recommend that the government in China make concerted efforts to ensure access to affordable, reliable, sustainable and clean energy sources, and accelerate rural households' energy transition.

Precision agriculture and robotics in forestry

The [Lincoln Agritech Precision Agriculture Group](#) have a track record in providing technologies and advice to enable more efficient agricultural and horticultural production to be implemented, including technologies and models to balance pesticide and fertiliser use, sustainable primary production and environmental protection.

One project they are currently leading is a Science for Technological Innovation National Science Challenge project to develop a 'Forest Track Clearing Robot' as part of the 'Ending with Impact Programme'. The NSC Spearhead project that was the foundation for this work has involved researchers from Lincoln Agritech and SCION, as well as Auckland, Victoria, Massey, Canterbury and Otago Universities.

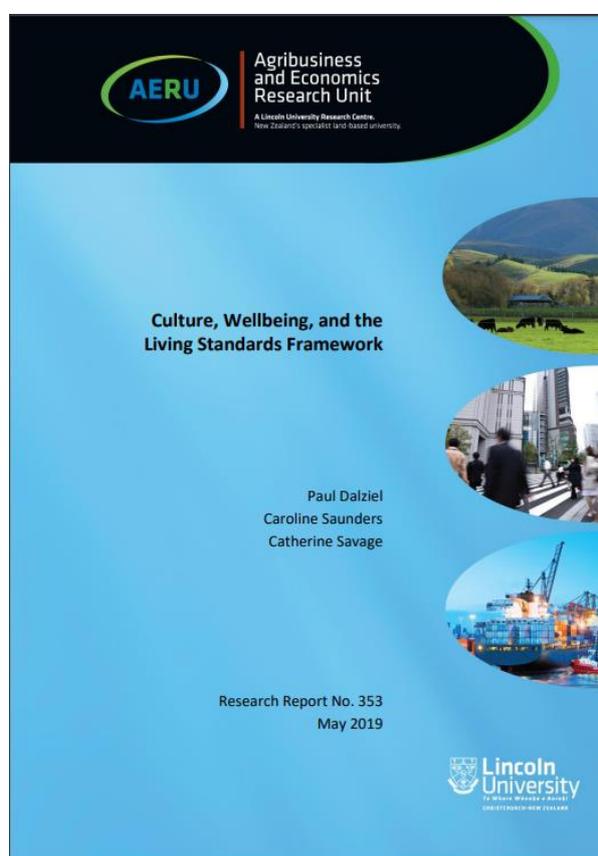
Through collaboration with end users, for example, the Lake Taupō Forest Trust, and robotics companies, Wrybill Robotics and Robotics Plus, the Group are building a novel controller for autonomous manoeuvring into a commercial mulching platform. The platform will do a semi-automated clearing of forest service tracks.

Culture, wellbeing, and the Living Standards Framework

Since its foundation by Cabinet in 1962, the Agribusiness and Economics Research Unit (AERU) at Lincoln University has performed world-class research focused on sustainable wellbeing. Under the leadership of its current director, Distinguished Professor Caroline Saunders, the AERU applies sophisticated analytical tools to create knowledge for research partners that include domestic and overseas government departments, international agencies, New Zealand companies and local organisations. Research by the AERU addresses significant issues affecting New Zealand’s economic prosperity and social wellbeing.

As part of its work programme to develop the [Living Standards Framework](#) (LSF) and the [LSF Dashboard](#), the New Zealand Treasury commissioned the AERU and Ihi Research to provide insight into important aspects of intergenerational wellbeing. The AERU’s work examined how culture appears in the LSF, demonstrating how the structure of the Framework could be used to create a Cultural Wellbeing Framework to assist decisions on investment in culture for wellbeing. The report supported the inclusion of culture in a wellbeing monitoring framework, both to honour its universal importance to human wellbeing, as well as recognising Government’s unique role in addressing cultural wellbeing. The publication was part of a larger research report, AERU Research Report No. 353.

Based on using the Treasury’s Living Standards Framework, an internal review of Lincoln University’s contributions to intergenerational wellbeing was commissioned.



In February 2021, Distinguished Professor Caroline Saunders and Professor Paul Dalziel completed an internal review of Lincoln University's contributions to intergenerational wellbeing, using the Treasury's Living Standards Framework. The authors have international reputations for research in wellbeing economics and will develop their report further in 2022. Their review draws on current economic theory to explain why knowledge is the most important factor supporting growth in wellbeing. This means universities make distinctive contributions to wellbeing because of their statutory purposes to create, teach, disseminate and curate knowledge to global standards of excellence. To illustrate, the review estimated that the net present value of the qualifications of Lincoln University graduates in 2019 totalled \$152.3 million.

Preparing students for their professional careers

In 2021 Lincoln University hosted a Career Fair with a record 48 exhibitors. The event was well attended by students from all disciplines and levels of study who were keen to boost their experience and prepare for their professional careers. With many different industries constantly wanting to recruit Lincoln graduates, this event provides an excellent networking opportunity.

The substantial turnout of both exhibitors and students contributes to the University's reputation for having the highest graduate employment rate of any New Zealand university. The Volunteering Expo, which connects students with organisations seeking volunteers and enhances employability through developing skills and confidence attracted 21 exhibitions.



Flexible working arrangements for University staff

Flexible working arrangements were introduced for Lincoln University staff in 2021, including the promulgation of the University's Flexible Work Policy and Procedure. Employment legislation provides for staff to make applications to enable them to work from home to meet their specific personal and family circumstances. Staff with children under five or with disabled children have the statutory right to request changes to their working arrangements.

In addition, it was announced that staff would be entitled to one day of Wellness Leave over the 12 months from 1 August 2021 to 31 August 2022. The new Wellness Leave day is seen as a designated time off that staff can use to recharge themselves in whatever activity they choose. It's all about work-life balance and taking time to schedule self-care activities to keep themselves well.

Protecting migrant workers

[Associate Professor Nazmun Ratna](#) is part of an interdisciplinary international research team looking at the safe migration of domestic and ready-made garment (RMG) workers from South Asia to the Middle East. Funded by the UK's Foreign, Commonwealth and Development Office (FCDO). The programme has already made policy gains. Women migrant workers make significant contributions to the global economy, but face risks of being subject to forced labour and trafficking, worsened by the COVID-19 pandemic. In a [policy brief to the G20](#), they argued that G20 and destination countries must consider migrant workers' rights and labour conditions with a specific focus on vulnerabilities created by the pandemic. Their key recommendations were taken up in [Paragraph 38 of the G20 Rome Leaders' Declaration](#):

- *“We commit to taking steps to support the full inclusion of migrants, including migrant workers, and refugees in our pandemic response and recovery efforts”.*

Associate Professor Ratna is also leading the development of the [Women Empowerment in Migration Index \(WEMI\)](#), a tool to reflect the multiple dimensions of agency of female migrants that will be integral to monitoring progress towards SDG 8.7 on the eradication of forced labour, modern slavery and human trafficking.

Labour abuses on board South Korean factory trawlers in New Zealand waters

In 2021 [Dr Ani Kartikasari](#) was part of a team that published their findings from a research project looking at [labour abuses on board South Korean factory trawlers fishing in New Zealand's waters](#). Through documentary research including migrants' employment contracts, interviews with an Indonesian crew and translation work for New Zealand government ministries, court cases and film productions, they looked at how recruitment agents are implicated, as seen through the crew's eyes, in three phases – before departure, onboard the vessels and following their return home.

Recruitment agents possess substantial power as the connecting link between those who exploit and those who are exploited and can operate beyond the reach of laws and regulations. The research team documented important gaps in the jurisdictions of countries that source migrant workers and those at the receiving end, and the need for firms recruiting migrant labour through intermediaries to address exploitative behaviours.

Partnership with T&G Global

A [new partnership with Turners and Growers \(T&G\) Global was finalised in 2021](#), offering students a hands-on learning experience and pathway into employment in the horticulture industry.



The newly formed partnership means that in future students can study towards a Diploma in Horticulture whilst earning a full-time wage and gaining valuable, practical work experience. Students will receive a combination of online and face-to-face learning, remotely with Lincoln University and in person with T&G trained coaches. T&G will also provide paid study days to help students with the academic components of the diploma.

The collaboration with T&G is an innovation in education, immersing university education within a leading New Zealand business, creatively recruiting and developing new talent for the horticulture sector. The programme would attract new, up-and-coming talent to the workforce and help provide support during the business' expansion and peak seasons.

Sport and recreation industry collaboration

The University celebrated its [10th anniversary](#) with New Zealand's Sport and Recreation sector at an annual event, bringing together Lincoln academics, students and sector professionals to exchange ideas, share the latest research and network. The 2021 event featured keynote speaker, Kereyn Smith, CEO of the NZ Olympic Committee, and a debate on whether sport had improved over the 10 years the event had run. The negative won, citing falling participation rates and concerns over the wellbeing of athletes.

Over the last decade, Lincoln staff and students have undertaken several research projects in collaboration with the sector which have considered issues such as teenage girls' sporting participation, ways to mitigate sporting participation drop-off between high school and University, sport volunteerism, outdoor recreation and risk, and the role of altitude training in high performance sport.

Collaboration and innovation within the food and fibre sector

B.linc Innovation He Puna Karikari is a business unit of Lincoln University which is passionate about collaboration within New Zealand Aotearoa's food and fibre sector. Through three pillars – creating events, offering a co-working space and facilitating projects – B.linc provides a platform where innovative insights can be shared and networking opportunities are facilitated.

The business unit runs five key events series designed to bring people together across diverse industries and disciplines to learn and share, think differently about the latest challenges and

provide opportunities to support and enable a prosperous and thriving agrifood and technology sector.

Game changing greenhouse gas emission reduction technology

Renowned LU scientists, Emeritus Professor Keith Cameron and Professor Prof Hong Di [delivered another breakthrough technology](#) with immediate benefit for the dairy farming sector to combat global climate change. Developed in partnership with Ravensdown the new technology is an effluent treatment system that reduces the methane emissions from farm dairy effluent ponds by up to 99%.



Launched to market in 2021 by Ravensdown and Lincoln University under the brand name EcoPond, the new treatment system also slashes the amount of E.coli in the treated effluent, reduces ammonia emissions, mitigates odour and cuts phosphate leaching losses from effluent areas into waterways by up to 90%.

The EcoPond system achieves its highly significant reductions in methane emissions by adding a treatment agent iron sulphate, a safe additive used in the treatment of drinking water, to effluent ponds. Both Professors Keith Cameron and Hong Di hope that the greenhouse gas mitigation delivered by EcoPond will be a gamechanger for dairy farmers.



REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

Mingma Norbu Sherpa Scholarship

The [Mingma Norbu Sherpa Scholarship](#) is a partnership between World Wildlife Fund, Lincoln University and the Greater Himalayan Foundation, and is awarded in memory of former student Mingma Norbu Sherpa. It recognises his lifelong commitment to helping Nepal's rural poor improve their livelihoods while living in harmony with nature. Students from remote rural regions of Nepal can study at Lincoln University to help build a new generation of conservation leaders for Nepal. The scholarship is for postgraduate study in the areas of natural resource management, tourism and the environment.



In [2021 eighteen Manaaki New Zealand Scholars, including two Mingma Norbu Scholars](#), were recognised at a completion ceremony. They were all presented with a certificate as well as mementoes before returning to their home countries.

The Manaaki New Zealand programme is funded by the Ministry of Foreign Affairs and Trade and has the goal of creating future leaders throughout the developing countries eligible for the programme. The scholars had earned a range of qualifications, including a Bachelor of Environment and Society degree, a Master of Water Resource Management, and several PhDs. The graduates attending the completion ceremony were from Indonesia, Uganda, the Philippines, Ghana, Vanuatu, Zimbabwe, Malawi, Papua New Guinea, Myanmar and Nepal.

A more equitable Aotearoa

Lincoln University and TupuToa have a new tertiary partner agreement to assist Māori and Pasifika students in internships and early career development programmes. The agreement aims to deliver sustained support for students and early career graduates to fulfil their career aspirations and become business and community leaders.

This partnership agreement also extends to support Pasifika students to gain internships in their home islands and across the Pacific. [TupuToa](#) seeks to ensure corporate Aotearoa is representative of the country. Māori and Pacific peoples make up a quarter of our population and yet are largely invisible in corporate New Zealand, even more so in corporate leadership.

Supporting Māori students to achieve their academic and leadership potential

The [Ekara James Lewis Memorial Scholarship](#) was launched in 2021. The scholarship supports Māori tertiary students to achieve their academic and leadership potential. It commemorates the former staff member and alumnus' contribution to Māori community development and education.

Established through a bequest from Ekara, who died in 2016, the scholarship is available to current Māori students studying towards a full-time Lincoln University undergraduate or postgraduate degree.

Manaaki Tauira Programme A learner success framework

The University continues its journey towards removing barriers to learning for all future and current tauira. While we aspire to help all our tauira achieve a positive sense of self-worth, wellbeing and belonging within society, our priority focus continues to be parity for Māori, Pasifika and disabled tauira.

In 2021 the University enhanced its commitment to better outcomes for its students and the achievement of parity for Maori and Pasifika tauira, through the formal establishment of the Manaaki Tauira programme to provide:

- Support for all tauira, especially Māori, Pasifika and disabled, to make a positive transition into, and successful completion of, tertiary education
- A clear understanding of what parity of participation and achievement looks like for Māori, Pasifika and disabled tauira at Lincoln University, and whether we are currently achieving it
- An understanding of why and how the University can address the reasons for not achieving parity
- A dedicated plan at the governance, management and leadership levels that supports our goal of achieving parity of participation and achievement for our Māori, Pasifika and disabled tauira
- Teaching and learning practices that respond to the needs of all tauira, with a focus on Māori, Pasifika and disabled tauira
- A dedicated Disability Action Plan (DAP), supported by the TEC Kia Ōrite Toolkit, ensures we do not discriminate against disabled people, and that disabled tauira experience better outcomes across their education journey
- A whole organisation commitment to learner success.



[Influencers@Lincoln podcast on Plains FM](#)

In 2020, Lincoln academic Dr Hafsa Ahmed, highlighted some of the world-class research and programmes, particularly in the Faculty of Agribusiness and Commerce, at Lincoln through Zoom-based interviews on YouTube.

In 2021 Hafsa expanded the range of interviews across the University and told the world about the fantastic work being done at Lincoln, published or in progress, from students or staff, and 'uncomplicating their research'.

She addresses some of the issues facing our food and fibre sector, New Zealand at large, and the rest of the world. From tourism to viticulture, to business and sustainability, the research podcast covers it all.

Landscape architecture focused on planning for climate change

The discipline of landscape architecture is focusing more and more on planning for climate change while building community resilience through cultural landscapes. These were points made by Nada Toueir, of Lincoln University's School of Landscape Architecture, when she shared her expertise at the [New Zealand-India Sustainability Conclave 2021](#).



Hosted by Education NZ, the virtual event focused on the relevance of the UN's Sustainable Development Goals to the international education sector and living more sustainably in general. Vice-Chancellors and academics from New Zealand and Indian educational institutions took part in a series of sessions on 5-6 October 2021 and shared their insights, emphasising the integral role sustainability plays in their educational frameworks.

[Dr Toueir spoke as part of a roundtable discussion](#) on conscious choices for sustainable living.

According to Dr Toueir, some of the key situations addressed by landscape architects in terms of climate change are floods and forest fires. Dr Toueir said Lincoln University works closely with landscape architecture professionals in Christchurch and with the city council, building projects that fight climate change and foster community resilience.

Use of electric vehicles

The Facilities Management department of Lincoln University has its whole fleet in zero emission vehicles (electric carts), plus a couple of bicycles. There is a total of 9 carts, and the hospitality section also has an electric cart.

As the University replaces its fleet it will change the full fleet to ZEVs by 2024. Five hybrid/ZEV vehicles have already been converted. In addition, the joint programme by the University of Canterbury and Lincoln University for Te Mātāpuna Mātātahi | Children's University provides a hybrid ZEV to staff members under the Lincoln University umbrella.

Flood mitigation in coastal cities

Low-lying coastal cities, like Christchurch, are facing increasing flood risks as climate change brings rising sea and groundwater levels and an increased frequency and intensity of storms. This will be worsened by the increased frequency and intensity of storm events and the continued expansion of urban areas, which creates greater surface runoff into rivers and reduces the area that can absorb water.

Under climate change uncertainty, conventional flood management approaches that rely on one-time investments in flood defence structures, like barriers, are risky, as it is uncertain whether their mitigation capabilities will be adequate, or even needed, under climate change. A more adaptive flood management approach is needed that can be rolled out with increased climate certainty through time.

After discussions with the City of Christchurch regarding their flood management approach, Dr Wendy McWilliam and PhD candidate, Suphicha Muangsri of the School of Landscape Architecture [developed an innovative strategy for providing supplemental flood mitigation](#) that complements Christchurch's existing flood mitigation system. The strategy involves the use of networks of green stormwater infrastructure (GSI), like detention ponds, on already developed large properties, like industrial land. GSI on different properties can be orchestrated together in networks and rolled out incrementally as needed with climate change.

The School used hydrological modelling to evaluate the strategy, finding that six of twenty evaluated property clusters could mitigate climate change-induced flooding just shy of the major change scenario of the IPCC, up to the end of this century. In addition to protecting our communities, this approach can be used to safely delay the implementation of more costly defence structures, like barriers and levees, until they are deemed cost-effective under climate certainty.

Scholars aid Red Zone project

Lincoln University Future Leader Scholars, working alongside volunteers from the Richmond Community Garden, prepared a site for a mushroom-themed education, play and foraging garden called [the Mushroom Room](#) as part of a community project in the Christchurch Red Zone.

The garden, located in the Ōtākaro Avon River Corridor Regeneration Area, featured at least six different native and exotic species of edible mushrooms for foragers. Te Tira Kāhikuhiku (TTK) awarded the project a grant of \$19,600 from the Red Zones Transitional Use Fund, to help bring the project to life by the end of April 2021.

Sustainable procurement

Recognising the substantial impact that procurement decisions have on the environment, alongside financial factors, the University considers social and environmental factors in its procurement processes. This includes the suppliers' policies and sustainable practices.

Committed to being an exemplar of sustainable practices for the land-based sector and the ecosystems within it, the University's [Sustainability Policy](#) outlines the actions and governance processes to prepare the University's study programmes, business operations and its students for a carbon zero future, including prioritising the wellbeing of people and planet when making strategic decisions.

The Sustainability Plan is the University's prime mechanism for delivering on its commitment to a sustainable future for people and the planet, setting out the objectives of being sector leaders in education, research and demonstration of sustainability, and becoming carbon neutral by 2030 and carbon zero by 2050.

Best practice for food safety

In 2021 Lincoln University became an [official partner of the New Zealand Food Safety and Science Research Centre](#). The Centre, funded by the Ministry of Business, Innovation and Employment, focuses on both public health and best practice for safe food production and the food supply chain. A key role of the [NZFSSRC](#) is to investigate food safety issues of interest to the industry. Projects range from future-focused, cross-sector risk assessments to evaluating new decontamination methods and everything in between.

Lincoln University researcher, [Professor Stephen On](#), was appointed to the organisation's Science Leadership Team which will evaluate the needs and priorities for New Zealand food safety. The move to sustainable production and packaging, the development of novel foods, and other impacts of climate change are challenges faced by the industry.

Sustainable and nutritious alternatives to animal-based proteins

The world needs a sustainable and nutritious alternative to conventionally derived animal-based proteins. Edible insects are one answer – requiring fewer environmental resources and creating less ecosystem pollution - but they remain a novelty in Western cultures. Associated with negative sentiments, they can be a hard sell as food. Lincoln University researchers are working on this problem.

[Dr Damir Torrico](#), Senior Lecturer, Department of Wine Food & Molecular Biosciences, has worked on a [project using Chocolate Brownies made with cricket protein](#). This tested consumers' reactions and feelings on eating insects and was one of the first studies to model sensory and emotional data together with demographic information.

Chocolate brownies were used as a product people enjoy and feel positively about. The findings will help the food industry better market insect foods for western diets.

Drivers and inhibitors in the acceptance of meat alternatives

Dr [Wim de Koning](#) and [Associated Professor David Dean](#) in the Faculty of Agribusiness and Commerce have tested a model indicating the [drivers of consumer attitudes and willingness to try meat-alternative proteins including insects](#). The study also surveyed consumers in nine countries – China, USA, France, UK, New Zealand, Netherlands, Brazil, Spain and the Dominican Republic.

Its findings point to the complexity of insects as a realistic alternative to meat and show that neophobia, the fear of trying something new, currently outweighs the perceived environmental benefits of switching to insects. The model they developed will now be a tool for identifying how consumer attitudes need to change to embrace insects and plant-based proteins.

Turning the question of cows' environmental impact on its head

New Lincoln University Pastoral Livestock Production Lab research is defining how to get the maximum benefit from cows predisposed to urinate nitrogen (N), resulting in less leaching to waterways. The research has turned the question of cows' environmental impact on its head.



Cows are viewed as a major environmental problem. High levels of nitrogen loading as a result of high concentrations of urea in the urine of dairy cows have been associated with widespread environmental degradation, such as reduced water quality and N₂O emissions. Traditional responses have been system-based, but PhD student Cameron Marshall asked a different question: Can cows be the solution? Can we breed animals that are more environmentally friendly to address environmental outcomes and satisfy consumer demand?

In his research, "[Animal as the solution: use of dairy cows divergent for milk urea nitrogen breeding values as a potential mechanism for reducing the environmental impact of pastoral dairy production practices](#)", Cameron's experiments show that with advances in genetics and knowledge of genetic interactions, the possibilities are numerous for designing future productive landscapes where the animal is not seen as a problem but rather as a solution.



TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

Certification milestone on journey to carbon zero

In 2021 Lincoln University gained Toitu Envirocare CarbonReduce certification to help track its progress towards becoming carbon neutral by 2030 and achieving carbon zero by 2050.

The certification involved an audit to certify the measurement of the University's greenhouse gas emissions on campus and a commitment to reducing emissions from a 2019 baseline.



The accreditation assured that Lincoln University was acting on climate change, as detailed in its Sustainability Plan.

Reducing carbon emissions

A group of projects has been initiated to regenerate the University's power, sewer, water, stormwater and heating infrastructure systems, to support university operations, improve service reliability and reduce deferred maintenance backlog liability.

Measures underway to reduce carbon emissions include new solar installations on-campus which are delivering a total of 522,00 kWh direct to the university's network - enough to power 72 average-sized houses for a year.

In addition, coal-powered heat generation will be phased out by 2024 and diesel generators by 2030. New buildings must adhere to Green Star building standards, while air travel emissions are to be offset, and the vehicle fleet is being converted to carbon zero. The university is seeking to reduce carbon emissions for field trips, encourages cycling and

carpooling, and is working to reduce waste, including composting food waste from the food halls

All operational greenhouse gas (GHG) emissions required under the international standard for carbon footprints, ISO 14064-1 (including vehicles, business travel, the daily commute of staff and students, fuel and electricity, paper, and waste), were evaluated to gain the certification.

The emissions are measured annually and the inventory is independently verified to ensure it is accurate and complete. To be certified, the organisation must continually manage and reduce emissions. Lincoln's demonstration farms will also display leadership in the sector and contribute to solving sustainability challenges, while the University campus will demonstrate world-leading standards in sustainable operations.

To reduce its emissions, Lincoln University developed a GHG emissions management plan and reduction targets, aligned to the Sustainability Plan goal of being carbon neutral by 2030 and carbon zero by 2050.

Supporting rural communities in extreme weather events

As climate change brings more extreme weather events, [Lincoln students remain alert to help their communities](#). In May 2021, intense rain brought [catastrophic 'one-in-200-years' flooding](#) to the Canterbury region, affecting the region from the Mackenzie to Waimakariri districts, with the most significant flooding impacting the Hakatere/Ashburton River catchment area. Flood damage affected community infrastructure and public and private property.



The Lincoln Student Volunteer Army (SVA) and the [Handy Landys volunteering club](#) joined forces to assist farmers and landowners with cleaning up their properties. Projects included clearing debris, repairing fence lines and removing silt.

Ōtākaro Living Laboratory Trust

Professor Roslyn Kerr, Dean of the Faculty of Environment, Society and Design at Lincoln University, and Convenor of the Lincoln University Living Laboratory, is a current representative on the [Ōtākaro Living Laboratory Trust](#). Established as a world-leading living laboratory in the Ōtākaro Avon River Corridor (OARC) in Ōtautahi Christchurch, the lab provides a place to learn, experiment and research, as well as test and create new ideas and ways of living for a climate-challenged city and globe.

The trust has representatives from the public, private and community sectors, including some of the key institutions in the city. It coordinates with other agencies and groups that have an interest in research and education in and around the river corridor.

Using nature to mitigate the fire risk

Climate change is increasing the number and intensity of wildfires worldwide. Lincoln Ecologist, [Associate Professor Tim Curran](#), is leading a team looking at plant flammability as a means of using nature to mitigate the fire risk and protect biodiversity. Using a specialised plant barbeque, his team has developed the biggest global dataset of flammability using a consistent tool and technique. This makes the comparisons extremely reliable. He has already tested over 450 species, including New Zealand natives, exotics and food crops, with the hope of getting over 700 in the next year.



The data is shared through the [Fire and Emergency website](#), allowing landowners, farmers, fire managers, planners and others to search for less flammable plants. Tim also regularly addresses community meetings advising on green firebreaks as a tool for reducing fire spread.

Planting strips of low-flammability species at strategic locations across the landscape can slow or stop the fire front, extinguish embers or block radiant heat. He worked with the Christchurch City Council to establish green fire breaks on the Port Hills following the devastating fires in 2017 that destroyed 1645 hectares.

Tim's next project focuses on the flammability of a large number of pasture, crop, mahika kai, rongoā (medicine) and other plant species to provide farmers, iwi, government agencies and other landholders with the toolbox to redesign and/or enhance their landscapes to reduce fire hazard – fighting fire with food. There were 4,586 wildfires in New Zealand and 13,348 hectares were burnt between 1 July 2020 and 27 June 2021 according to Fire and Emergency New Zealand.

Crowding-out effect impacting national climate change policy

Telling people how to save energy makes them less likely to support government policies on climate change, new research has found. Lincoln University lecturer [Dr Jorie Knook](#) was a co-author of [Priming for individual energy efficiency action crowds out support for national climate change policy](#) with Zack Dorner (University of Waikato) and Philip Stahlmann-Brown (Manaaki Whenua – Landcare Research).

The study looked at the crowding-out effect, which occurs when people who are encouraged to take one action for the environment are less likely to take or support a second action. This phenomenon is an issue if household actions, such as changing lightbulbs, reduce support for national climate policy, which has a much bigger potential to reduce emissions than low-cost individual actions.

In the survey, half of the participants were asked to think about implementing low-cost energy efficiency measures in their households. All the participants were then asked about their support for a national policy intervention that reduced emissions from fuel use and would raise the price of petrol.- The results showed a crowding-out effect from individual actions on support for national policy, with lower support among those primed to think about energy efficiency. The crowding-out effect was strongest among those most worried about climate change. This suggests that reminding people about individual actions they can take reduced their worry and made them less likely to support national policy.

Crowding out is not generally considered in the development and implementation of policies, but questions have been raised concerning the probability that the promotion of these actions could undermine public support for more comprehensive policy measures. The survey was conducted among lifestyle farmers in 2019 as part of the Survey for Rural Decisions Makers, run every two years by Manaaki Whenua. The results were consistent with other studies in other countries, meaning similar results are likely if conducted among urban households. The authors said the study contributes to an understanding of when and why crowding out occurs to help communicate about climate change policy.



CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

New coastal marine management research scholarship

A [new postgraduate scholarship to support coastal marine management research](#) was made available for students in 2021.

Lincoln University is co-leading research into law, policy and practice options to bring about ecosystem-based management (EBM) for Aotearoa New Zealand's coastal marine area, funded by the Sustainable Seas National Science Challenge. The Challenge addresses the question of how we can best develop our marine economy while protecting the taonga of our marine environment.

Managing our marine ecosystems

Current marine management systems have failed to prevent ongoing habitat degradation and loss. Lincoln University's [Associate Professor Hamish Rennie](#) is part of a [research project](#) with the University of Canterbury's Associate Professor Elizabeth Macpherson to look at legal and policy options for ecosystem-based management (EBM). The project is part of the Sustainable Seas National Science Challenge.

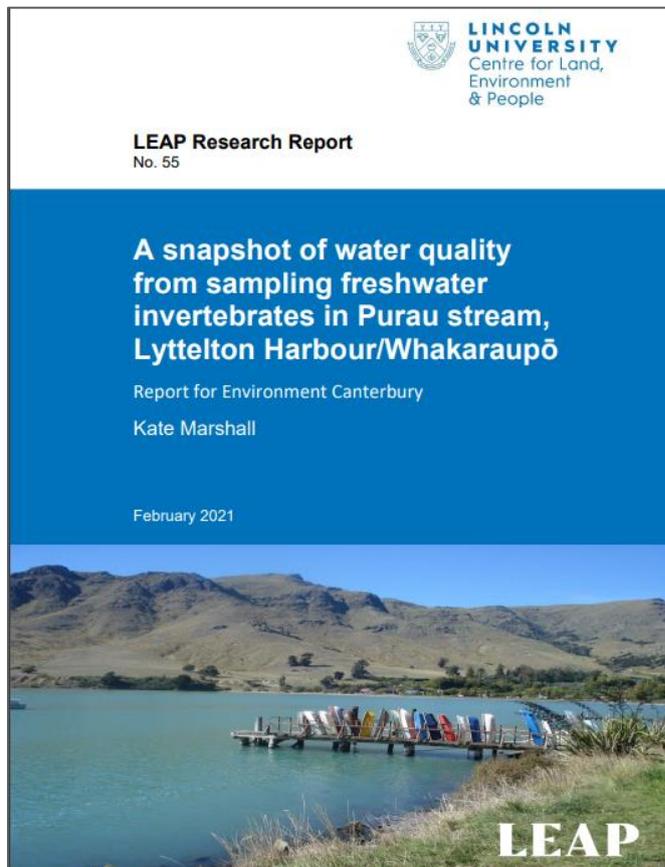
EBM involves managing the marine environment holistically and inclusively, so competing uses of the marine environment do not degrade it further. In a 2021 article, the team reported back on a comparative study of EBM in law, policy and institutional design in New Zealand, Australia and Chile. They found that a new way of thinking about EBM is needed, looking at it as a relational process requiring laws, policies and institutions to support its dynamic process of dialogue, negotiation and adjustment. This will enable new ways to secure cross-government collaboration and community buy-in, as well as having inbuilt adaptability to the dynamics of the marine environment and the impact of climate change at different scales.

Healthy harbour

Whaka-Ora Healthy Harbour is a partnership between Te Hapū o Ngāti Wheke, Te Rūnanga o Ngāi Tahu, the Lyttelton Port Company, Environment Canterbury and Christchurch City Council. It works to restore the ecological and cultural health of Lyttelton Harbour. Whaka-ora Healthy Harbour and Lincoln University jointly funded a summer research scholarship to investigate the environmental quality of Purau and Te Wharau streams.

In a [LEAP Report, *A snapshot of water quality from sampling freshwater invertebrates in Purau stream, Lyttelton Harbour/Whakaraupō*](#), Lincoln student Kate Mitchell examined the diversity of aquatic invertebrates as an indicator of the stream health for a report commissioned by Environment Canterbury. She found that overall, the health of the streams was good but that the Purau Stream has degraded in quality and work needs to continue to restore the waterways so water quality can be maintained. She concludes that "Actions such as riparian plantings, fencing waterways, limiting fertiliser and pesticide use where possible can all help with nutrient run-off and erosion control to contribute to better stream health. Harvesting of the

pine plantations will also need to be managed with care to prevent run-off into the streams and out into Lyttelton Harbour/Whakaraupō.”





PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

A green campus

93.2% of the total square metre campus area is covered in vegetation, as reported in the University's GreenMetric July 2021 submission.

As Aotearoa New Zealand's only specialist land-based university, Lincoln University is deeply committed to its purpose to facilitate excellent research and education, and to nurture our current and future generations of kaitiaki (guardians), equipping them with the skills, knowledge and inspiration to help shape a world that benefits from a greater understanding of the relationships between land, food and ecosystems.



Given the strategic imperative for Lincoln University's campus landscapes to reflect its unique connection to the land, a comprehensive and visionary landscape master plan was developed for phased implementation. The new landscapes showcase a broad diversity of ecosystems, where inclusive exterior courtyards of native and exotic green spaces contrast and complement the built environments. This was demonstrated in the demolition of the Union Building, badly damaged in the Canterbury earthquakes of 2010/11, leaving in its wake a new greenspace which was named Union Lawn.

Sustainability lies at the heart of all that we do, and nearly 50% of Lincoln University's research funds are dedicated to sustainability research. The University remains intimately connected to the quality of its research programmes and their application to real-world problems.



Lincoln contributes to conservation series

Lincoln academics and alumni were involved in the production of a 2021 RNZ podcast and documentary series, [Fight for the Wild](#), chronicling the desperate battle to protect our native species. [Associate Professor James Ross](#), director of the [Lincoln University Centre for Wildlife Management and Conservation](#), advised the producer, while Adjunct Associate Professor Elaine Murphy and alumni Tom Agnew and Jenny Dent, both working for Zero Invasive Predators Ltd (ZIP), appeared onscreen.

The series focuses on the fact that every year, an army of introduced predators devours the eggs and chicks of some 26 million native New Zealand birds, as well as countless insects, amphibians, reptiles and plants. There are currently 4000 natives on the threatened species list and much more vulnerable to predation, a situation referred to as “New Zealand’s catalogue of shame”. The series also explores the notion of a Predator Free 2050 and asks whether the initiative is achievable.

The [Centre for Wildlife Management and Conservation](#) (CWMC) provides new, effective and humane tools for reducing invasive mammalian pests and monitoring biodiversity increase. It also contributes to the creation of sustainable environmental, social and economic outcomes in the field of conservation. The multidisciplinary CWMC team and collaborators include experts in animal ecology, wildlife management, pharmacology, toxicology, design engineering and pest control professionals. The centre is focused on inspiring, through teaching and research, a new generation of motivated students to make a difference and take conservation to a new level in New Zealand and internationally.

Grazing in future multiscapes

In mid-2021, Lincoln University’s Centre of Excellence: Designing Future Productive Landscapes hosted a [virtual international workshop series](#) on more sustainable and ethical grazing systems. Involving presentations from experts all over the world and offering more breadth of topic coverage than any other scientific convention, the series included six weekly online workshops. Discussions centred on re-imagining models of pastoralism in terms of ‘multiscapes’, including thoughtsapes (ways of thinking), landscapes (environments such as

soil, water and air), foodscapes (dietary perceptions and health), socialscapes (societal demands) and wildscapes (interactions between agriculture and wildlife). Keynote speakers covered subjects as diverse as system thinking, rangeland, grasslands, grazing management, ecology, indigenous development, agroecology, environmental ethics and sustainability, economic sociology, natural resource management and landscape design. The discussions can be accessed via the [Multiscapes YouTube channel](#) and [podcast series](#)

Dryland Pastures Group awarded for two decades of transformative change

The remarkable work of Lincoln University's renowned [Dryland Pastures Group](#) was recognised with the 2021 PGG Wrightson Significant Achievement Award in Agriculture/Horticulture. The research group, led by [Professor Derrick Moot](#) and made up of Lincoln academics and students, was founded in 1998 to develop dryland pastoral farms that create resilience to climate change. The group focus on quantifying the interactions between plant species, temperature, and rainfall to develop robust on-farm management systems and deliver the findings to the public.

It is very rewarding to be engaged in research that actually gets implemented to make a difference and address the big issues of the day – land use change, climate change and social and environmental resilience. Professor Moot



As a result, the past two decades of work have led to a New Zealand-wide transformation of rainfed agriculture, a type of farming that relies on rainfall for water. The group have created profitable and productive systems that are resilient to climate change and sympathetic to the environment. To reach farmers, students and the wider public with their findings, the group have published their science in more than 150 peer-reviewed papers over the past decade and packaged it on their website in the form of videos, fact sheets, presentations and detailed case studies.

Pest control

Possoms are a pest species in New Zealand, threatening biodiversity, native flora and fauna and the beef and dairy industries (by being the primary host for bovine TB). Pest control requires ongoing surveillance and management for successful eradication. In 2018, the Cacophony Project developed a new land-based thermal camera. These cameras have cloud-based AI technology, enabling them to identify species from video remotely.

[Associate Professor James Ross](#) led research on this new tool to assess its effectiveness over existing monitoring techniques. Pen trials were held on campus, followed by field trials around the country. Professor Ross' [2021 report](#) concluded that the thermal cameras had consistently higher detection rates than chew cards and PIR trail cameras and a combination of GPS, PIR trail cameras and thermal cameras provides crucial information on encounter and interaction rates. The results suggest a monitoring grid of one device per 25 hectares should reliably detect most animals, a major advancement over current labour-intensive methods.

Commitment to academic freedom

The University recognises the government-mandated role of the critic and conscience of society. Academic freedom is enshrined in legislation (Education Amendment Act 1990 s161). University researchers are free to select the subject matter of their research, seek support from any source for their work, and form their own findings and conclusions.

Lincoln University established a Critic and Conscience of Society Award in 2019 to formally recognise activities by a staff member undertaking the important role of the public academic, and their freedom to provide independent expertise and comment on issues. The award acknowledges activities that provide the public or government with independent, expert commentary on New Zealand or global issues affecting society and future generations.

The [2021 winner](#) was Professor Jacky Bowring in recognition of her contribution to, and influence in, the field of design – from a local to an international scale, and across academic and professional realms.

Educating students, reducing harm

To encourage wellbeing and mental fitness, and to decrease the mental trauma caused by sexual harm, most first-year Lincoln students are required to participate in a workshop known as Respectfully Lincoln. Led by the Wellbeing and International Support team, the staff-student collaboration delivered over 30 Respectfully Lincoln workshops to 477 students in 2021, the programme's third year.

The two-hour workshops are compulsory for all first-year students who are under 21 years old and cover topics such as consent, what constitutes sexual harm and how students can act courageously in creating a safe and respectful campus. The workshops are delivered by existing students who have received training in the area of sexual harm prevention. Respectfully Lincoln has been recognised as good practice by Te Pōkai Tara Universities NZ.

Providing expert advice

Distinguished Professor [Caroline Saunders](#) serves as a Crown appointee on the Board of Manaaki Whenua Landcare Research and an external member of the Reserve bank Monetary Policy Committee. Manaaki Whenua is New Zealand's Crown Research Institute (CRI) for the land environment, supporting government decisions and policies at the local, regional and national levels. The Reserve Bank Monetary Policy Committee is responsible for making monetary policy in New Zealand to maintain price stability and support maximum sustainable employment.

Professor Hamish Gow's appointment to the co-op's panel sits well with his role at Lincoln as a leading spokesman on trade policy and global value chains. The Milk Price Panel is responsible for carrying out reviews of the milk price and the Milk Price Manual and supervising the calculation of the base milk price. Professor Gow's research and industry experience extends to agribusiness innovation, strategy, and market analysis. He has led

market development projects in more than 50 countries and has also consulted with the European Commission, OECD, IFAD, USDA, World Bank, as well as many more multinational groups, farmer organisations and governments.

Professor Ken Hughey is the Chief Science Advisor for Te Papa Atawhai Department of Conservation (DOC). He has worked extensively in the science policy space, chaired the kauri dieback and myrtle rust strategic science advisory groups and has assisted DOC in procuring and developing a new weather forecasting service. He has also been involved in aspects of sustainable tourism development.

Memorials to victims of violence in South America

Responding to traumatic memories is one of the most profound roles of the designed landscape reports School of Landscape Architecture postgraduate student Yeimy Walker. From an initial Masters project [examining memorials to the victims of violence in Colombia and Mexico](#), Yeimy is embarking on a study into Landscape, Memorials and Justice in Latin America, a region with a distinctive context of colonisation, exploitation and drug violence, but little studied about memorials.

She is examining how responses to colonial memorials have been expressed in the Latin American context, and how these responses can inform future designs that are equitable, inclusive and just. Motivated by the current global reaction to a number of societal issues relating to social justice, equality and human rights, such as the Black Lives Matter (BLM) movement, anti-colonialism, anti-police brutality, anti-racism, indigeneity and equality, the project intends to create critical conversations and changes around the colonial-era monuments' past, present and future. The goal of the research is to develop landscape architecture practices that bring opportunities for building more equitable, just and fair public spaces.

"I explore the narratives that are engraved in stone, and personal objects, providing unique reflections from the victims' families. Shoes are adopted metaphorically as a witness to the tragedy and testimony to the presence of the victims. The empty shoes embody a sense of emptiness in a deep reflection of temporality, embracing the fragility of human nature and reminding us of the vulnerability of the human body" Yeimy Walker



Columbarios - Auras Anónimas, "Anonymous Auras". Each plate has serigraphy depicting silhouettes of people carrying the bodies of the victims of violence in Colombia. Central Cemetery of Bogotá, Colombia. Beatriz González, 2009.



Memorial to the 49 children who died in the Sonora daycare fire, Mexico City, Mexico, 2017

Photos credit Yeimv Walker

Climate justice essential to address sustainability concerns

The world needs to focus more explicitly on climate and environmental justice in the fight for a sustainable future. [Dr Ritodhi Chakraborty shared his views](#) at the 2021 Sustainability Research and Innovation Congress (SRIC), an annual event bringing together more than 1400 global leaders, experts and industry.

He was selected as one of five Early Career Champions for the event, which prioritises supporting and elevating the next generation of scholars and thought leaders. All five champions spoke during the congress's ending plenary that summarised the major outcomes of the conference, with Dr Chakraborty addressing the topic, 'Sustainability for Whom?'

During his speech, Dr Chakraborty said global sustainability could not occur without achieving equity for the most vulnerable and underrepresented communities.

National Science Challenges

The National Science Challenges bring together the country's top scientists to work collaboratively across disciplines, institutions and borders. Funded by the government, they tackle the biggest science-based issues facing New Zealand. There is considerable overlap with the UN's Sustainable Development Goals, and the Challenges are a key way Lincoln University researchers are developing improvements to policy and practice in areas such as climate change, sustainable use of the environment and coping with natural hazards.

Lincoln University is a collaborative partner in the following challenges:

- [New Zealand's Biological Heritage | Ngā Koiora Tuku Iho](#)
- [Our Land and Water | Toitū te Whenua, Toiora te Wai](#)
- [Resilience to Nature's Challenges | Kia manawaroa - Ngā Ākina o Te Ao Tūroa.](#)

And leads projects in Sustainable Seas | Ko ngā moana whakauka and The Deep South | Te Kōmata o Te Tonga.

Professor [Anita Wreford](#) leads The Deep South Programme on Impacts and Adaption. This programme explores how the many and varied impacts of climate change will interact with each other and how communities, policymakers, end-users and other stakeholders can make robust decisions about adaptation. [Read more](#)

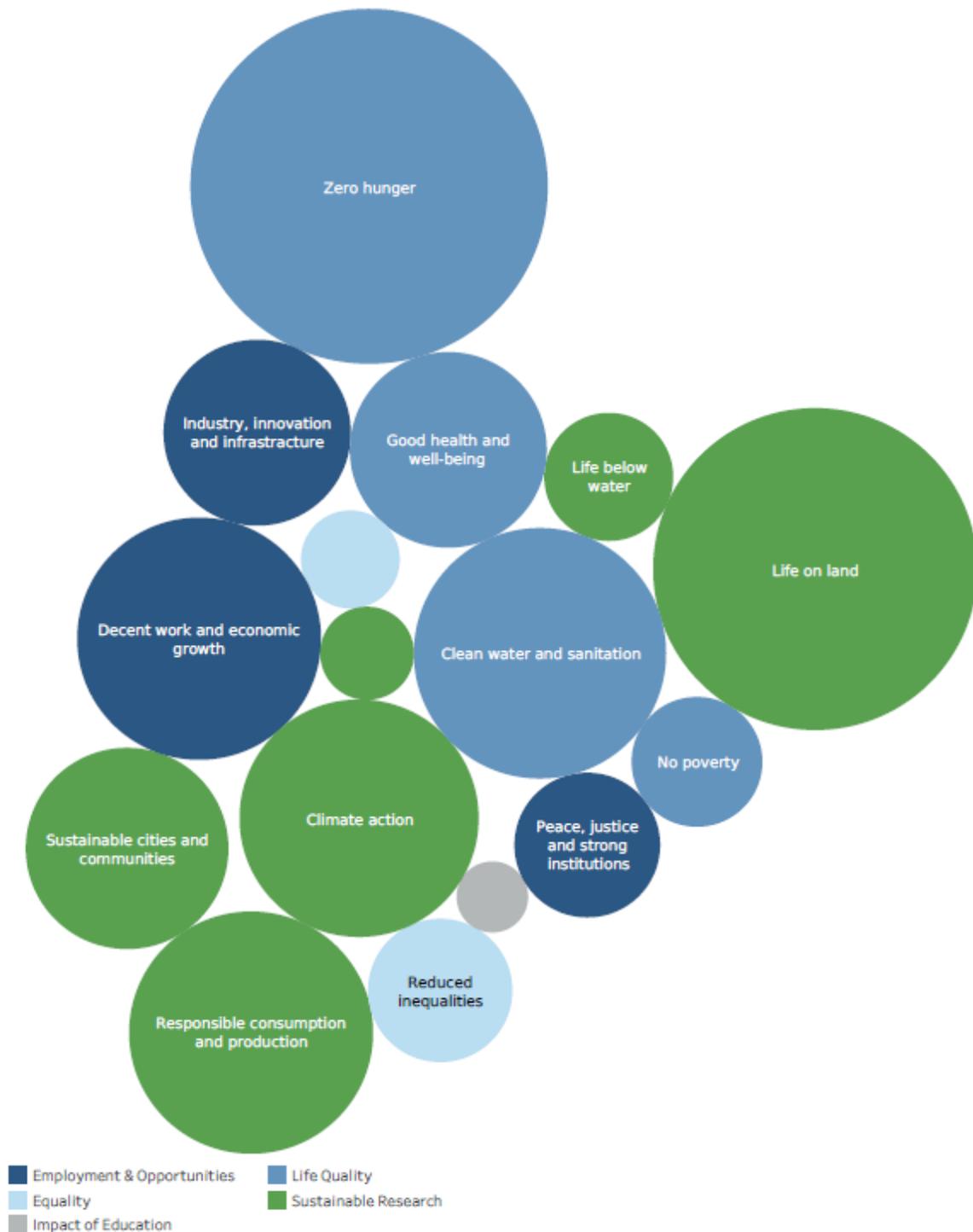
Several Lincoln University researchers are working on projects for the Sustainable Seas challenge. This challenge focuses on developing knowledge, tools and resources for ecosystem-based management (EBM) in Aotearoa. BM is a holistic and inclusive way to manage marine environments and the competing uses for, demands on, and ways New Zealanders value them. Tools are being developed for policymakers, marine resource managers, Māori, industry and communities. Projects include recovery of Kaikoura's tourism industry and the impact of the 2016 earthquake on Māori marine economy and blue economy in the areas, policy and legislation for EBN, and growing sustainable marine ecotourism.

Lincoln University is involved in the National Science Challenge's project on rural sector adaptation to climate change, which included a symposium in May 2021. [Growing Kai Under Increasing Dry](#) is a collaboration between the Deep South Challenge, Resilience Challenge and Our Land and Water National Science Challenges focusing on drought and its impacts.

Professor Anita Wreford presented one of the initial webinars, 'Drought and the changing climate: What to grow and where?' as well as facilitating a panel at the combined in-person/online event. She addressed how to incorporate adaption to climate change in near-term decision-making despite the uncertainty around climate change modelling. A critical question facing New Zealand in terms of climate change is at what point will increasing drought-frequency trigger land use change?" Another important issue discussed was the need for regional and local councils to focus on the resilience of rural communities and the mental wellbeing of farmers. [The report of the Symposium is available online.](#) It brought together scientists, government, industry, rural NGOs and farmers.

Sustainability related research output

Sustainability related papers published by Lincoln University. Research papers published 2016-2021



QS Sustainability Ranking 2023

All significant subcategories contain a label

:

Researcher profiles

In 2021 Lincoln University added the Sustainable Development Goals as a searchable filter on our researcher profile site. Researchers can select which SDGs they are working on and highlight these in their profiles. This not only shows Lincoln University's commitment to the SDGs but will help build new collaborations in these areas.



Dr Hafsa Ahmed

Lecturer • Department of Global Value Chains and Trade

As an applied researcher, I explore the not-for-profit sector, public sector and business schools with particular focus on stakeholder-centric value creation through projects/initiatives. I undertake this research by working collaboratively with people/institutions to solve practical challenges/issues they are facing. This allows me to creat...

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 view network

UN Sustainable Development Goals: 17 Partnerships for the Goals • 10 Reduced Inequalities • 11 Sustainable Cities and Communities • 9 Industry, Innovation and Infrastructure • 4 Quality Education • 8 Decent Work and Economic Growth • 1 No Poverty • 2 Zero Hunger • 12 Responsible Consumption and Production • 16 Peace, Justice and Strong Institutions

Aotearoa SDG Summit Series

Lincoln University was proud [to co-host the 2020-2021 Aotearoa Sustainable Development Goals Summit Series](#) with the University of Canterbury. Due to COVID-19, the event moved online, and three hui and a virtual summit were held.

The journey started with exploring how we as individuals and/or organisations understand the global goals (See the Change), then understanding how we can enable these goals (Be the Change), before delving into how we can collaborate to achieve these goals. (Working together for Change). The final summit looked at Collaboration for Systemic Change. The online summit represented a pivot from a planned two-day face-to-face event and brought together business leaders, experts, students, community leaders and government organisations under the theme 'Collaborating for Systemic Change'.

The event was opened by Minister of Foreign Affairs, Nanaia Mahutawho began the summit with a keynote presentation reinforcing the Government's commitment to achieving the SDGs. Participants took part in a range of interactive workshop sessions. The summit also included 10-minute presentations on topics of SDG interest, with Lincoln University Senior Lecturer Dr Hafsa Ahmed presenting on the topic, 'Uncomplicating the integration of the United Nations Sustainable Development Goals into management education programmes.

A key outcome of the series was the Aotearoa SDG Declaration, a statement of commitments that signatories agree to abide by to advance the SDGs in New Zealand. Lincoln University was an inaugural signatory of the Aotearoa SDG Declaration, demonstrating our commitment to sustainability and meeting/overcoming the challenges facing the world. Nearly 200 individuals and organisations signed the declaration. A recording of the summit, including the 39 individual sessions can be found on [the 2021 Aotearoa Virtual SDG Summit YouTube channel](#).

Lincoln Envirotown

Lincoln University works closely with [Lincoln Envirotown](#), a charitable trust dedicated to fostering sustainable communities in Selwyn District, our local area. The University sponsors and jointly hosts events, works on the restoration of Mahoe Reserve, hosts the trust on campus, has a representative on the committee and our students support many events.

Mahoe Reserve is 3 km from campus. The pit itself was formed from the extraction of shingles used for roads and railway projects. It was also used as illegal refuse. Ecological disruption from human settlement led to unprecedented losses of native biodiversity, including invertebrates, birds and lizards. This has resulted in the local extinction of some species. Since 2006, the local community, including Lincoln University, has been working to restore the area to a healthy indigenous ecosystem. There are regular planting sessions and a monthly working bee, widely advertised at the University and attended by staff and students.