

Sustainable Development Goals 2022 Update





Introduction from the Vice-Chancellor

Tangata Tū, Tangata Ora Engaged, Empowered, Making a Difference

Kia ora

This year I am delighted to present our third SDGs Update document. Our sustainability chapter of the University of Canterbury's Strategic Vision 2020-2030 is the basis for measuring our progress against our sustainability targets. Overall, we have made considerable progress. In addition to this, our work has continued on those business-as-usual sustainability work programmes not captured in the Strategic Vision. Significant work has continued on our carbon reduction and management. We have progressed with a highly complex, multi-year project removing coal combustion for ground source heat pumps, continued with replacing vehicle fleet with hybrid and electric vehicles, and have now expanded EV charging facilities on campus. We introduced a new Sustainability Plan setting out five key priority areas, including introducing new plans targeted at improving biodiversity on campus and reducing our waste.

Our new Bachelor of Social Environmental Sustainability degree officially commenced with strong student enrolment numbers for its first year. This multidisciplinary degree explores the biggest global problems, from pollution and climate change to world hunger. It was also the second year for our new Bachelor of Environmental Science with Honours. This innovative degree was developed in response to employer demand for greater

specialisation in Environmental Science in consultation with Ngāi Tahu. Students gain an understanding of the interface between Mātauranga Māori and scientific knowledge systems. We also continued offering PhD scholarships to advance research relevant to the SDGs, including granting Māui scholarships for students from schools in lower socioeconomic areas.

We commenced a significant piece of work to understand climate-related risks to our physical infrastructure. Stage One of this project, completed in 2022, followed a best-practice methodology to identify high level risk categories, the basis for more fine-grained analysis next year. We have also been working to align our carbon reporting with both the Carbon Neutral Government Programme, and with the New Zealand Climate Standards which came into force at the start of this year.

Of notable events, we proudly hosted on campus the inaugural Titohu Tūroa Sustainability Showcase in October 2022. This is a joint showcase with the University of Canterbury and the Christchurch City Council, for the purpose of presenting research and action towards creating a more sustainable future. The free event was open to the general public and UC Community, available in-person and on-line. Ten presentations featured the latest research and local developments given by experts from UC and Council across many sustainability issues, including transport, food waste, coastal adaptation, affordable energy, and urban forest planning. The event gave people the opportunity to hear from top speakers driving sustainability outcomes locally and nationally, such



as the Chair of the Climate Change Commission, leading academics, Christchurch City Council staff, postgraduate students, and business leaders.

Finally, our beautiful on-campus Waitutu Community Garden turned 20 this year. Staff, students and all those who have contributed to the space celebrated in the garden, where people connected, reminisced, feasted on wood-fired pizza and listened to live music.

Thank you to our sustainability kaupapa, the University community and our partners, for making 2022 such an eventful year.

Professor Cheryl de la Rey

Tumu Whakarae | Vice-Chancellor
Te Whare Wānanga o Waitaha | University of Canterbury

Our Sustainability Strategy

Our new Sustainability Plan (2022–2030) headline activities involve:



leading by example as a role model, with plans to become carbon net neutral by 2030 and removing our reliance on coal by 2023;



conducting and sharing research that contributes to resolving global challenges;



offering learning opportunities to empower students to make a difference in the world and to work towards the 17 Sustainable Development Goals (SDGs);



recognising and rewarding people for sustainable efforts and engagement; and



emphasising partnerships for the SDGs by connecting to global and national communities and networks.

Priority areas include:



Contribute to resolving SDGs through Learning and Teaching



Ensure Research Contributes to Global Sustainability Challenges



Becoming carbon net neutral by 2030



Improving Environmental Sustainability



Grow our Sustainability Networks

2022 Highlights

Awarded over

\$20M in scholarships

2,236 Māori students

enrolled

**Hosted Titohu Tūroa
Sustainability Showcase**

with the Christchurch City Council, sharing how research combined with work by local organisations is creating a better future

**Released our
Sustainability Plan,**

with sustainability activities for our teaching, learning, research, and campus operations

**Established the Sustainability
Programme Board,**

to oversee our strategic sustainability implementation plans

Granted Māui scholarships

for students from schools in lower socioeconomic areas

670 Pasifika students

enrolled

Continued to lead by example

with progress in our Boiler & Ground Heat Pump Conversion Projects to remove reliance on coal

Released our Waste Plan,

with priority areas across campus focused on stronger, short and medium term, reduction targets

**Established the
Sustainability Committee
of Academic Board,**

to promote sustainability and the SDGs in our curriculum and research

**Introduced new PhD
scholarships**

for research on the SDGs and sustainability issues

**Our Waiutuutu Community
Garden turned 20 this year!**

**Finalist in the Australasian
Green Gown Awards**

for our work on hosting Aotearoa New Zealand's national SDG Summit

Released our Biodiversity Plan,

setting out how we aim to improve campus biodiversity over the short term

**Commenced the mapping
of our Courses related
to the 17 SDGs,**

to empower students to make a difference in the world and work towards the SDGs

1 NO
POVERTY



**End poverty
in all its forms
everywhere**



Building a brighter future in Aotearoa

Ezra Hirawani is determined to find solutions for whānau without power and he has been recognised for his mahi with the 2022 University of Canterbury Young New Zealander of the Year Award – Te Mātātahi o te Tau. Ezra co-founded Nau Mai Rā, a purpose-built, kaupapa Māori energy retailer, delivering affordable, “always-on” power after discovering how many families lived in power poverty. An estimated 100,000 New Zealanders find it hard to pay for power. The Nau Mai Rā model asks customers to pay their bills weekly and cultivates mana-enhancing relationships, and it has resulted in one of the industry’s lowest debt rates. “Nau Mai Rā is truly building a brighter future in Aotearoa. Ezra’s initiative in response to a clear need for whānau across Aotearoa without power has had an incredible impact on many lives, and that is something to be proud of,” says UC’s Vice-Chancellor Professor Cheryl de la Rey.

Vision Mātauranga

In 2022, UC ran its inaugural UC Vision Mātauranga Development Fund and awarded NZ\$100,000 to seven successful projects as a mechanism to support Vision Mātauranga. Among the successful applicants who are to lead the research projects, 59% identified as Māori.

Student Volunteer Army (SVA)

The UC SVA regularly organises food drives and distributes food parcels to local communities. For over 10 years, SVA has grown to a national movement of young people actively involved in their communities and continues to be one of the biggest student groups on campus. UC is proud to support the SVA to make a positive difference, not only within the local community, but across the wider Aotearoa New Zealand.

Centre for Entrepreneurship

UC is home to Te Pokapū Rakahinonga the Centre for Entrepreneurship which offers a social enterprise program that aims to address poverty by creating sustainable

business models. The Centre connects, challenges and supports students and staff to create impact by building capabilities in entrepreneurship and innovation. Programmes and events are designed to broaden minds, challenge ideas and empower students to make a real difference.

Te Pātaka

Te Pātaka, the student hub, houses a number of co-located services to support students with services such as access to Kaitoko (academic advisors) including Kaiurungi Māori and Pacific (Māori and Pacific student advisors). Having these services in one space also allows other staff to improve their knowledge and expertise in areas like the academic advising skills of Kaiurungi, and the pastoral and cultural capabilities of Kaitoko. Another benefit is it helps align our plans for targeted assistance for priority students.

UC Pasifika graduates celebrate their success

Graduates and their families were invited to formally acknowledge their success and achievements at the Pasifika Graduation Celebration in December. This was also an opportunity to come together as a community to thank whānau for supporting students through their time at UC.



Vice-Chancellor Professor Cheryl de la Rey with recipient

UC offers a wide range of study options in SDG 1, including:

- ✓ The Politics of Need: Globalisation, Poverty and Welfare Provision
- ✓ Policy Debates in the Social Services
- ✓ Ethics, Politics and Justice
- ✓ Introduction to New Zealand Politics and Policy
- ✓ Social Services in Aotearoa
- ✓ City Politics and Urban Policy

46 publications based on Elsevier mapping

50% publications based on international collaboration

Based on publications from 2018 to 2022

2 ZERO
HUNGER



**End hunger, achieve
food security and
improved nutrition and
promote sustainable
agriculture**



Small-scale farming the future of global agriculture?

Small-scale farming could be part of the solution to climate change, according to some of the world's top scientists. UC Biological Sciences Professor Jack Heinemann contributed to the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Cycle (AR6) Report released in April. In Chapter 5 of the report, scientists were asked to review and assess relevant studies, focusing on strategies for adapting the food system to climate change. "An agroecological or similar approach, supported by breeding suited to farms that have more mixed cultivation rather than monocultures, and are dependent on fewer external high carbon inputs such as manufactured fertilisers, could replace our failing green revolution approaches," Professor Heinemann says.



IPCC contributing writer Professor Jack Heinemann from UC's School of Biological Sciences says small scale farmers feed 80% of the world, and use less carbon-intensive inputs.

Our Community Garden is 20!

Te Ngaki o Waiutuutu/Waiutuutu Community Garden, on the UC's Ilam campus, celebrated its 20th anniversary. For 20 years now the Community Garden has continued to provide a calm and beautiful space for students, staff and neighbours, as well as producing hundreds of kilos of veggies each year! Garden Coordinator Jam Kelly is an experienced organic gardener and provides a



Students upturn the lawn to create the new UC Community Garden 20 years ago.

welcoming presence for volunteers. The garden is open to students, staff and neighbours, however most of the garden's volunteers are students who are interested in environmental sustainability issues such as composting and soil health, are looking to swap an hour's labour for some quality produce or want to connect with others. "Students get involved for different reasons. A lot of time they have an interest in growing, and it's a relaxing, beautiful space," says Kelly.

Palm kernel product may be harmful to cows

Each year, New Zealand imports about 2 million tonnes of palm kernel expeller (PKE), a by-product of palm-oil processing to feed dairy cows. Professors Sally Gaw and Brett Robinson, together with PhD student Hadee Thompson-Morrison discussed their research on the chemical composition of several batches of PKE imported into Aotearoa over two years. Their research showed PKE contains concentrations of some elements that may be harmful to cows, with concentrations of iron, magnesium and phosphorus that exceeded safe levels for dairy cattle health. Some batches contained concentrations of aluminium, copper, sulphur and potassium within 90% of their safe limits, and may cause nutrient imbalances in dairy cows. The actual effects on dairy farms, soils and milk are yet unknown. There is an opportunity here to

repurpose food waste and the nutrients it contains for New Zealand's primary sector. This is the subject of ongoing research at UC.

Why you should start composting

UC environmental science students Kaitlyn and Jess Lamb shared their love of composting and practical tips at our Waiutuutu Community Garden as part of World Biodiversity Day. Both are studying first year Environmental Science; Kaitlyn is majoring in Environmental Contamination and Jess is majoring in Ecosystem Health & Biosecurity. "Composting is a big deal because we send far too much rubbish to the landfill," Jess says. "About 30% of waste being sent there is organic waste, which means it could be composted!" "In the landfill, food scraps produce methane gas, which is in fact 23 times worse than carbon dioxide as a greenhouse gas," Kaitlyn says. "Composting is a way in which we can minimize the waste we produce, therefore decreasing the impact we have on our one beautiful earth." "We can all make compost," Jess adds. "It is just a mixture of organic materials such as food scraps, brown leaves, paper, grass clippings... the list goes on! And from this, we can make dark, crumbly compost, which brings life back into the soil and feeds our plants."

89 publications based on Elsevier mapping

66% publications based on international collaboration

Based on publications from 2018 to 2022

3 GOOD HEALTH
AND WELL-BEING



**Ensure healthy
lives and promote
well-being for all
at all ages**



Innovation in health and safety recognised

A collaborative effort by our Grounds team won them UC's 2022 Health & Safety Award, the second award the team has received in the last three years for being innovative in health and safety initiatives. The team are responsible for collecting on average 20 tonnes of leaves each year, and won the award this year for their modification of an existing tractor-mounted leaf-sucker unit to a more ergonomic trailer-mounted design, greatly reducing fatigue and muscle strain for operators during the five-week leaf drop season.

Helping NZers stay healthy

Wanting people to live healthier and happier lives is a big motivation for UC's senior lecturer in public health Dr Matt Hobbs, who was recognised for outstanding work in his field. Dr Hobbs won UC's Early and Emerging Career Researcher Award for his research investigating public health inequities which affect some of Aotearoa New Zealand's most vulnerable groups. His research has covered how community water fluoridation can reduce preventable hospital admissions for children, the long-term health impacts of air pollution exposure, childhood and maternal immunisation, and how the environments young people grow up in can affect their mental health



Dr Matt Hobbs, UC Early and Emerging Career Researcher Award winner

Wellbeing Matters

UC aims to provide a sustaining environment where the holistic wellbeing of students, staff and our community enables our people to be successful, engaged, empowered and making a difference. Our Wellbeing Matters Platform offers a raft of tools to help everyone thrive. Each month, new content is released based on a wellbeing theme, including evidence-based articles, wellbeing tips and challenges, worksheets, quizzes, videos, webinars, workshops and podcasts, all designed to motivate and build good wellbeing habits, one habit at a time.

Health issues in the community

In this UC course students are provided with the foundation to understand health issues in the community and to develop skills related to improving it. Students are introduced to concepts, practices and skills to effect better health and wellbeing within communities, and student can also 'deep dive' into community health issues, being able to choose one health issue and a focus community for the whole course, with all three modules and assessments based around the issue and community.

Study tackles collisions in junior rugby players

A two-year world-leading UC study kicked off the 2022's rugby season amid growing concern about health and safety in the sport. Lead researcher Professor Nick Draper aims to better understand collisions in junior rugby. Professor Draper, who is an experienced junior rugby coach, says the study is timely given rising concern from parents and the rugby union community about health risks associated with head collisions. MRI scans will be carried out on the player pre-season, post-season and after any concussive collision as part of the research. The football clubs involved have expressed their support for the research and say they look forward to Professor Draper's findings.



Artwork from UC's Te Rua Makerspace drawing table is displayed on the walls but this is just one of the activities award-winning Kairuruku Wāhi-auaha | Engagement and Learning Librarian Jessica Saul offers in this popular space.

Te Rua Makerspace

Each month, at least 500 UC students and staff visit Te Rua Makerspace in the central library, where Jessica Saul enthusiastically caters to different interests, skill levels, and needs. Saul graduated with a Bachelor of Design Innovation majoring in Industrial Design and earned her master's degree in designing wearable medical robotics. Te Rua Makerspace is a large, airy room with 3D printers, sewing machines, a textile printing machine, a long table for drawing, a games area, and several pressing machines. "It's the community hub for creators from across the university, whether you are staff or a student – we welcome everyone," Saul says. Saul sees the effects spending time in Te Rua Makerspace has on people. "It's amazing how a short time here can transform someone who comes in visibly stressed out and not ready to talk, but after 10 minutes of drawing or me saying 'hey, would you like to just colour with me?' they are ready to try another activity or talk about what's stressing them," says Saul.

453 publications based on Elsevier mapping

58% publications based on international collaboration

Based on publications from 2018 to 2022

4 QUALITY
EDUCATION



**Ensure inclusive
and equitable quality
education and
promote lifelong
learning opportunities
for all**





Hillmorton High School biology students were enthusiastic about using UC's Biodiversity Box at a recent camp at Wainui.

High school students wade into biodiversity

Hillmorton High School teacher Sharnae Ladkin was impressed with the results after she used the UC's biodiversity box with her students on a recent Wainui Biodiversity camp. The biodiversity box is one of the ways we support local schools and the community in biodiversity activities and other science outreach work. The box is free and provides equipment that schools don't typically have to give teachers the opportunity to conduct hands-on monitoring activities in their local waterways that would otherwise be impossible. The resources also allow school students to be real scientists for a day and investigate their own waterways in the same way our research scientists do.

Growing the diversity of local and national talent

Jointly led by UC and Lincoln University, Children's University | Te Mātāpuna Mātātahi aims to raise young people's aspirations for higher education and encourage lifelong learning. In 2022, among the many experiences on offer, UC Professor Donald Matheson worked with undergraduate students to run four sessions for school students aged 7–11 years aimed at developing their critical media skills. Children's University was on campus on 8

September 2022 for a session on geological sciences with UC academic staff. UC also engaged with thousands of secondary school students from Aotearoa New Zealand. Our Māori and Pacific staff visited 35+ schools throughout the country to engage over 600 Māori and Pacific students.

Future Learning & Development Think Tank

Using immersive digital worlds for education has been around for a while now. UC's Future Learning & Development Think Tank hosted one of its regular opportunities for students and staff to learn about what UC is doing in this space right now. Speakers showcased the work they are doing in Virtual Reality, Augmented Reality, Simulated Reality, Mixed Reality and Extended Reality, and opened up the discussion on what the future may hold for teaching and learning.

UC Master's student to become Rhodes Scholar

Elliott Hughes will be studying for a Doctor of Philosophy in Mathematics. Elliott is currently studying for a Master of Mathematical Sciences in Mathematics and Statistics, having previously completed a BA in Mathematics



Dame Cindy Kiro, Elliott Hughes and Distinguished Professor Dame Jane Harding

and Statistics at UC. Ironically, he hasn't always loved maths, however he credits UC with sparking his love of the subject. "At the end of high school, I took part in the STAR programme at UC... and this really smoothed the transition to university study and helped me get off the right foot," Elliott says. Elliott is particularly focused on "the urgent need to find the right combination of political will, economic investment and technological development to halt climate change and eliminate our reliance on fossil fuels".

New scholarships to help tackle sustainability issues

NZ\$1.5M was allocated for new scholarships that will help PhD students to tackle sustainability issues. The scholarships are for 14 emerging researchers to pursue projects in areas as diverse as health, early childhood education, indigenous youth leadership, food security, green design, gender, ecosystems, peace and justice, community, carbon capture in oceans, equity, and transport. "We are preparing our students to help solve the challenges of a future world that is likely to be warmer and more uncertain. These scholarships strengthen that commitment and will progress important research across areas of environmental, social and economic sustainability," says Professor Jan Evans-Freeman, Pro-Vice-Chancellor Sustainability.

205 publications based on Elsevier mapping

42% publications based on international collaboration

Based on publications from 2018 to 2022

5 GENDER
EQUALITY



**Achieve gender
equality and empower
all women and girls**



Improving gender diversity

This year saw several initiatives to improve gender diversity, such as by increasing the proportion of external women engineers supervising and supporting UC students in their final-year design projects. Women in Space Aotearoa New Zealand is a professional network, founded by members from UC, that supports women working in the space sector. This community aims to encourage women and gender minorities, including future generations, to pursue a career in space, particularly through studies in science, technology, engineering and mathematic (STEM) fields.



UC's Psychology building to be named the Ann Ballin building after Dame Reubina Ann Ballin.

UC building to be renamed after victims' advocate

A UC graduate and staff member who was a life-long advocate for victims and people with disabilities is being honoured when a building on our Ilam Campus is to be renamed after her. UC's Psychology Staff Block building will be named the Ann Ballin building after Dame Reubina Ann Ballin. Dame Ann Ballin chaired the Victims' Task Force from 1988 to 1993 and pioneered changes in the criminal justice system to improve justice for victims of crime. She also contributed expertise to other groups, including the Royal Commission on Social Policy. She

received an honorary doctorate from UC in 2001. In 2002 she was awarded the country's highest civilian honour – membership of the Order of New Zealand. "Dame Ann Ballin, who died in 2003, was a life-long advocate for people with disabilities – she herself was in a wheelchair – and for victims' rights. She was also a UC graduate of psychology and a UC student counsellor. In recognition of her career and the impact she had on our students and staff over many decades, we think it's very appropriate that the Psychology Staff Block building is renamed the Ann Ballin building," says Acting Executive Dean of Science Professor Janet Carter.

UC student launches into aerospace industry

Engineering student Jennifer Berry is one of 51 (mostly American) undergraduate students earning a place at leading aerospace organisations after winning a prestigious Brooke Owens Fellowship – the first person from the Southern Hemisphere to become a fellow. Part of the fellowship is to intern at an aerospace organisation and Berry will work at Space Capital in New York City. Space Capital is an early-stage venture capital firm that invests exclusively in space-based technology. Berry says it felt "unreal and slightly overwhelming" to discover she would be the first person from Australasia to join the American aerospace fellowship. During her second year at UC, she interned at Rocket Lab's New Zealand headquarters. "It is a huge privilege to be in a position to uplift and support other young women and gender minorities in this part of the world with their future applications and in their journeys in the aerospace sector," says Berry.

How do people react to Women Doing Science?

International scientists are using social media to both promote images of diverse women in STEM (Science, Technology, Engineering, Maths) and study how people respond to these posts. The research team, which includes researcher Dr Camilla Penney from UC, run an Instagram account where they share photos of women in STEM doing



Engineering student Jennifer Berry

their research with accompanying descriptions. Although their research suggests social media can contribute to challenging stereotypes of women in STEM, the researchers emphasise that more effort is needed in other areas to alleviate gender and racial gaps. "Social media can only go so far – aspiring scientists need real-life role models to look up to, which ultimately needs more effort from institutions to get the diverse graduate students who represent most of the featured scientists on Women Doing Science into senior positions," says Dr Penney.

77 publications based on Elsevier mapping

43% publications based on international collaboration

Based on publications from 2018 to 2022

6 CLEAN WATER
AND SANITATION



**Ensure availability
and sustainable
management
of water and
sanitation for all**



Bringing clean water to Tongan schools

Using technical skills and community engagement, a group of UC humanitarian engineering students worked alongside staff and students at schools in the Kingdom of Tonga to install drinking water treatment systems, which consist of membrane filters and a UV chamber to disinfect water for 2,500 students in three schools.



UC Diploma in Global Humanitarian Engineering students bring clean water to Tongan schools

Banding together to boost study in waterways

UC and Lincoln University have signed an agreement to run postgraduate degree programmes in water science as jointly awarded courses – a first in Aotearoa New Zealand. The teaching and research partnership will be located in a new combined Waterways Centre on UC's Ilam campus. Centre Director Professor James Brasington says the Centre is central to the freshwater sector, providing independent research, tertiary education and professional development in water science and management. "It is increasingly clear that we face a future characterised by periods with too little, then too much water, and water that is, far too often, too dirty to use safely or to support

healthy ecosystems. Learning how to assess these risks, adapt and find new solutions that ensure sustainable and equitable access to water for both people and ecosystems couldn't be a more urgent challenge. Our new programmes will provide graduates with the professional skills and theoretical understanding needed to drive transformative change," says Professor Brasington.

About hydrological and ecological engineering

Our Hydrological and Ecological Engineering Group conducts research worldwide on diverse yet interrelated topics such as hydrology, water resources, erosion control, integrated catchment management, stormwater, irrigation, flood prediction, water quality, mine drainage, engineered treatment wetlands and biofuels. The Group use the Environmental and Fluids labs for research. The fluids lab has one of the largest hydraulic flumes in New Zealand, used for sediment transport studies and another flume for landslide and erosion studies. The environmental lab is also well equipped, including a particle size analyser, gas chromatograph, climate-controlled sub-rooms, automated logging capabilities, ion analyser and total organic carbon analyser. Other analytical equipment for field research includes a rainfall simulator, topographical laser scanner, weather station, automatic samplers, river surveyor and flow tracker and multiple portable instruments for measuring water quality and flow, including an inductively coupled plasma-mass spectrometry (ICP-MS) instrument, used for advanced analytical techniques for determining trace element concentrations in a range of water, sediment and biomass samples.

Water Resource Management Education

Managing the world's precious water resources requires professionals to have multidisciplinary knowledge and an integrated approach. Water Resource Management students learn how to develop innovative and effective methods for the sustainable management of this critical



Engineering student member of the Hydrological and Ecological Engineering Group

resource in Aotearoa New Zealand and internationally. UC offers an extensive range of study options in water resource management, including:

- Advanced Water Resources
- Water Quality and Quantity Assessment
- Water Management, Policy and Planning
- Research and Communication Methods
- Master of Water Resource Management
- Water Resource Management PhD
- Applied Hydrogeology

183 publications based on Elsevier mapping

55% publications based on international collaboration

Based on publications from 2018 to 2022

7 AFFORDABLE AND
CLEAN ENERGY



**Ensure access to
affordable, reliable,
sustainable and
modern energy for all**



Māori perspectives in research on sustainable energy

Civil Systems Engineering Senior Lecturer Dr Rebecca Peer's research project engages with Māori iwi and hapū to understand Indigenous perspectives on energy, sustainability, and energy transitions. The project supports ongoing research on pathways towards a net-zero energy system, with the goal of integrating mātauranga Māori into planning and evaluating our energy futures in Aotearoa New Zealand.

New EVs for UC

We aim to have a fleet of 97% fully electric/hybrid vehicles by 2030. This year we purchased six further electric and hybrid EVs (three passenger and three service vehicles) to replace our petrol and diesel vehicles. Additional charging points scattered around campus were also added.

Novel approach using night light

A novel statistical modelling method is helping to identify areas across the globe most in need of aid and infrastructure. The collaborative research of UC Professor of Statistics Elena Moltchanova and the International Institute for Applied Systems Analysis in Austria uses global earth observation systems to tackle large-scale problems. Professor Moltchanova says electrification holds great promise for increasing wellbeing, via off-grid power generation or grid electrification with significant positive impacts on household income, expenditure, health, and education. "Many poor areas do not have access to any electricity at all" and do not have "access to computers and phones which we take for granted" or "access to medical equipment, which again, requires electricity. So, for poorer areas, it is important to electrify", says Professor Moltchanova.

Sharing knowledge worth millions

After receiving multi-million-dollar funding to unlock significant hydrogen concepts, UC and University of Otago researchers joined forces with community initiatives.

The researchers are working in collaboration with a local Christchurch company, Fabrum. Together the teams will strive to embed skills and learning across pathways that will enhance the ability for learners to engage with all the aspects of renewable energy, including hydrogen in its many facets.



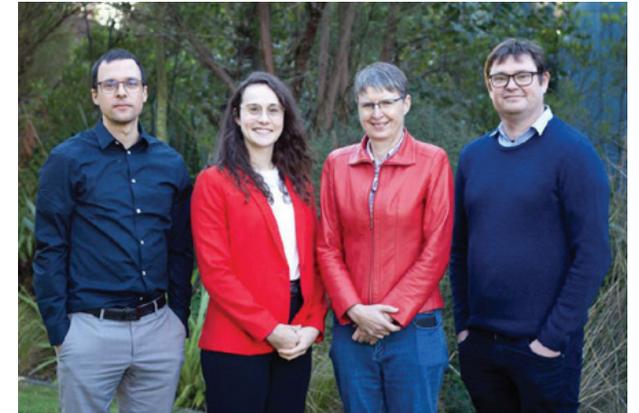
UC Professor of Statistics Elena Moltchanova

UC offers a wide range of study options in SDG 7, including:

- ✔ Sustainable Energy Systems
- ✔ Electrical Power Systems
- ✔ Energy, Technology and Society
- ✔ Emerging Energy Technologies and Management
- ✔ Energy Systems Modelling and Analysis
- ✔ Electric Power and Machines

Research advancing green hydrogen energy

Civil Systems Engineering researchers Dr Rebecca Peer and Dr Jannik Haas are leading a project to develop an integrated energy system model for New Zealand that could provide sustainable transport, heating, and electricity. Chemical and Process Engineering Professor Aaron Marshall is leading a collaborative project to develop a new type of electrolyser – a tool that splits water into hydrogen and oxygen – to produce hydrogen energy in a more cost-effective way.



Researchers from Canterbury and Otago Universities. Pictured from left: Dr Jannik Haas (UC), Dr Rebecca Peer (UC), Professor Sally Brooker (UO), and Professor Aaron Marshall (UC).

224 publications based on Elsevier mapping

76% publications based on international collaboration

Based on publications from 2018 to 2022

8 DECENT WORK AND
ECONOMIC GROWTH



**Promote sustained,
inclusive and sustainable
economic growth,
full and productive
employment and decent
work for all**



UC eyes the Digital Screen future

We are very excited to announce a new multi-million-dollar Digital Screen Campus (DSC) – the first of its kind in Australasia! Situated on our Dovedale Campus in Christchurch, the new facility will provide a vibrant DSC environment with a combination of industry partnerships and work-integrated learning, providing training for future leaders in film production, game development and cross reality, helping the country play a key role in the future of digital screen convergence.

David Strong, New Zealand Film Commission CEO commented, “New Zealand is renowned for pushing boundaries, challenging industry norms, and redefining technology in the screen industry. The DSC will provide the skills, connections and knowledge needed for a new generation of innovative, creative storytelling by New Zealanders for New Zealanders, and continue our country’s reputation for excellence and a strong screen production industry that can compete globally.”

In 2023 we will welcome the first cohort of students to the Bachelor of Digital Screen (Hons) - a new, four-year degree focusing on six majors, industry partnership and work-integrated learning. With a record number of students enrolled, and design work on the redevelopment and construction of our Dovedale campus kicking into gear, we’re on our way to becoming Aotearoa New Zealand’s pre-eminent screen school!



An artist's impression of the University of Canterbury's Digital Screen Campus



Kiwi Game Starter participants

Kiwi Game Starter competition

We continue to respond to the needs of the digital screen industries. This year UC sponsored the Kiwi Game Starter 2022 competition, a business start-up competition supporting the best of New Zealand’s up-and-coming game development talent. Talent shortage is one of the biggest issues facing both the digital screen industries and the tech sector. The Kiwi Game Starter competition provides game developers the opportunity to gain recognition, industry mentorship and strengthen their skills, supporting them in pursuing a career within the industry. UC’s Executive Director of Planning, Finance and ITS, Keith Longden says, “Digital screen industries within Aotearoa New Zealand can only grow and develop as long as we encourage, educate and develop talent for all critical roles, which is why it is important for the University to create and support opportunities like our Digital Screen Campus, and the Kiwi Game Starters competition.”

HIT Lab NZ celebrates 20 years of innovation!

The Human Interface Technology Laboratory NZ (HIT Lab NZ) at UC is celebrating two decades at the forefront of human interface technology research. Twenty years on, the HIT Lab NZ is going from strength to strength using VR, AR and applied immersive game design to achieve real-world solutions and have a positive impact on industry advancement in Aotearoa. Since it began, HIT Lab NZ has

been heavily involved in supporting postgraduate research, and every year the team produces numerous research articles, posters, podcasts, and other research outputs.

Bachelor of Youth and Community Leadership

UC’s Bachelor of Youth and Community Leadership meets a growing need for innovative leaders who can make an impact on national and global challenges that youth and other communities are encountering. The degree develops professional leadership and entrepreneurial skills for those passionate about issues such as youth work and development, sustainability, human rights, equality, social entrepreneurship, and humanitarian work.

Career Services is here to help!

Career Services at UC is here to help our students and recent graduates. Support services are free for students and recent graduates to help them make career decisions confidently and intentionally. Students can meet one-on-one with qualified consultants to identify strengths, explore career and study options, and build work-ready skills. Help is also at hand with job-hunting strategies, CV, applications and interview practice. Further services include career development support, connecting students with employers, and there is also an Online Career Centre with free access to over 100 career resources that can build, track and boost a student’s professional profile with the latest career development tools.

202 publications based on Elsevier mapping

77% publications based on international collaboration

Based on publications from 2018 to 2022



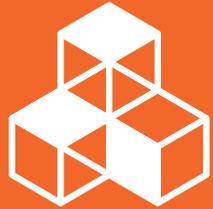


“

Aotearoa New Zealand becomes a new home for more than 1000 refugees every year. UC is committed to ensuring students from refugee backgrounds are provided with a raft of support services.

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9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



**Build resilient
infrastructure, promote
inclusive and sustainable
industrialisation and
foster innovation**





Professor Philip Butler was made a Companion of the New Zealand Order of Merit. Professor Butler is best known for leading the development of the MARS Bioimaging 3-D colour x-ray, a world-first breakthrough in medical technology.

Professor Philip Butler honoured

World-renowned UC Physics Professor Philip Butler was made a Companion of the NZ Order of Merit for services to science, education and health. During a stellar 50-year career, spent predominantly at UC, Professor Butler is best known for leading the development of the MARS Bioimaging 3D colour x-ray, a world-first breakthrough in medical technology. Earlier in his career, he led the New Zealand team engaged with ground-breaking particle physics research through the Compact Muon Solenoid experiment. He later co-founded the National Science Technology Roadshow Trust and the Science Alive Charitable Trust in 1991, both promoting learning and careers in science and technology, and helped establish the Tekapo Dark Sky Reserve.

Local talent and technology shines through

Virtual Screen Production (VSP) is being heralded as a revolution in the future of film production. Using a curved wall comprised of hundreds of LED panels, VSP allows actors to perform and interact with their surroundings as they would if they were on location. The technology sparked the interest of several Christchurch-based creative organisations, who saw the opportunity to tap into an abundant pool of local talent and technology at

UC's ground-breaking Digital Screen Campus (DSC). "We know good things happen when industry and education come together, so when we were approached about collaborating on this project and contributing a vital funding stream to ensure it could proceed, we couldn't say no," says Petra Westropp, DSC Project Manager. "It's a great sign of the incredible talent that resides here in Christchurch and New Zealand," says Petrina D'Rozario, Screen CanterburyNZ Manager.

Medal for quake research

UC's Council awarded Professor Misko Cubrinovski with the 2022 UC Research Medal for his huge contribution to geotechnical engineering here and internationally, and for his role in the recovery phase after the Canterbury earthquakes. Professor Cubrinovski played a key leadership role in research and recovery efforts following the earthquakes, including analysis for the Canterbury Earthquakes Royal Commission, and providing expert opinion and advice to government, regional and professional agencies, and the wider engineering community. "Looking back over the past 12 years or so, I am really glad that I was here in Christchurch able to help the community and New Zealand geotechnical profession. All that previous preparation, knowledge and experience suddenly came to fruition," says Professor Cubrinovski.

Improving clarity of satellite images

Satellites are increasingly being released beyond our atmosphere, but what happens if we lose communication



UC Associate Professor Stephen Weddell, research lead of the Computational Adaptation Research Group.

with a satellite and can't see it to understand why? UC's Associate Professor Stephen Weddell is leading a research group to significantly improve the image quality of low-Earth orbiting satellites and space debris. "We want to minimise these threats and provide accurate information back to people like the European Space Agency and other organisations who are monitoring these satellites," says Associate Professor Weddell. The team have developed an adaptive optic system for New Zealand's largest telescopes at UC's Mt. John Observatory and are the first to be able to develop this technique and apply it to satellites. "This research is really important as it is providing capability within New Zealand, and an ability to share that information, particularly with our strong collaborations around the world," says Associate Professor Weddell.

Finding solutions for the shipping industry

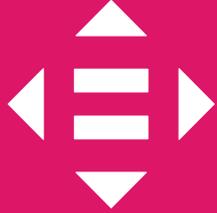
An industry-academia research partnership could help offer solutions to reduce the carbon footprint of the freight transport industry. UC researchers are collaborating with a New Zealand shipping company on practical pathways to tackle the problems of a sustainable transition to a low emission future. "The partnership is important to the University as it provides a degree of data availability which is often difficult to attain due to the commercial sensitivity of freight data," says UC researcher Dr Patricio Gallardo.

202 publications based on Elsevier mapping

68% publications based on international collaboration

Based on publications from 2018 to 2022

10 REDUCED
INEQUALITIES



**Reduce inequality
within and among
countries**





Takere scholarship recipients

Takere prepares Māori and Pacific students for life at UC

Almost 50 Māori and Pacific students are taking part in Takere, a scholarship programme they say builds friendships, allows them to embrace and express their cultures, and gives them a solid grounding in university life. The five-week programme includes workshops, field trips, and a 15-point 100-level UC course, building meaningful connections and providing academic and wrap-around support to ensure success in tertiary studies. Takere continues to make a positive impact by offering ongoing support, mentoring, and workshops throughout the academic year and culminating in a celebration ceremony and hākari (feast) that the students' whānau and caregivers can attend.

Stay with dignity

People affected by climate change in regions such as the Pacific are often portrayed as victims and their history of resilience to environmental challenges is too often overlooked in policy and research. While it's true that some people are choosing to, or are forced, to leave their homes and land because of climate change, others are staying,

says Dr Dalila Gharbaoui, UC Climate Crisis research fellow. Dr Gharbaoui believes there's a huge knowledge gap about those most vulnerable groups who are either forced to stay or want to stay despite the challenges of climate change. "Pacific people are not 'victims' and they are proudly dealing with the issue today. We need to listen to what the communities need, respecting and reflecting on their values and perspectives with the aim to have that knowledge going back to support and serve communities that are the most affected," says Dr Gharbaoui.

Geospatial tool for Māori-led planning

Geospatial Research Institute and UC researchers presented a seminar on their work alongside community members of Te Manatōpu Hau Kainga o Ōhinemutu on a Māori map-based tool to help the people of Ōhinemutu inform and be informed about important initiatives in their community. Ōhinemutu is a village built on the shores of Lake Rotorua, famed for its geothermal features. Current and potential uses of the tool include community planning, environmental management and the general sharing of narratives of Ōhinemutu whilst at the same time holding and protecting mātauranga (Māori knowledge) through protected levels of access.

Support for students from refugee backgrounds

Aotearoa New Zealand becomes a new home for more than 1000 refugees every year. UC is committed to ensuring students from refugee backgrounds are provided with a raft of support services. Our Academic Skills Centre offer a wide range of English language support programmes and workshops, such as reading, writing, speaking, listening, and giving an oral presentation for English language learners, as well as additional academic skills development opportunities on how to succeed academically.

“
To have another
chance to create
a new beginning,
start with
grasping all the
opportunities
you had wished
you'd once had

Viyān Basharati

”

119 publications based on
Elsevier mapping

53% publications based on
international collaboration

Based on publications from 2018 to 2022

11 SUSTAINABLE CITIES
AND COMMUNITIES



**Make cities and human
settlements inclusive,
safe, resilient and
sustainable**





UC Professor of Geography Simon Kingham.

Will shared transport improve our lives?

The impact of shared transport on two different Christchurch communities could determine transport goals for Aotearoa New Zealand. Professor Simon Kingham is leading a team of researchers from Canterbury, Lincoln and Otago universities as part of a study for two National Science Challenges – Ageing Well and Healthier Lives – to understand what happens when shared transport was introduced in two demographically different communities. The Christchurch-based study examines the impact of shared transport options into a lifestyle village and a community housing trust on those communities. The study, measuring the effect on wellbeing, physical activity, social connection and safety, has been running for over a year producing initial survey results and has just over two years to go.

Our Community Garden has turned 20!

UC's beautiful Waitutu Community Garden turned 20 this year. Staff, students and all those who have contributed to the space over the past twenty years were invited to come celebrate in the garden. People connected, reminisced, feasted on wood-fired pizza and listened to live music.



Our last travel modes survey indicated, collectively,

47% of staff and students cycle, walk or bus.

Building resilient cities

UC PhD candidate Bryann Avendaño has developed a game that could foster community-based resilience to plan cities for the future. The game simulates real life social and infrastructure decisions that will have to be made by stakeholders and policymakers in the face of climate change. Avendaño has worked with modelling and game-based simulation solutions with communities in Latin America and was recognized as a solution maker during the 2019 General Assembly of the United Nations in New York City for his work bridging the gap between scientists and communities facing climate change challenges. "I hope that this game-based simulation will not only be a methodology, but also a tool that local governments and local authorities can use here in New Zealand and abroad," says Avendaño.

Cycling with Confidence

Our Sustainability Office hosted two free workshops for staff and students looking to bike to work, local shops or around town. It was an opportunity to get practical, personalised advice in a safe, supportive and fun environment. Workshop one covered cycle safety skills and techniques in an off-road setting, and workshop two put all the skills into practice on the cycleways and quiet roads surrounding the Ilam campus.

Partnering in climate change planning

A partnership between UC and the Christchurch City Council is leading the world in understanding and adapting to risk from climate change. UC Civil Systems Engineering lecturer Dr Tom Logan specialises in how cities and communities prepare for the changing and uncertain climate. Dr Logan says, "This partnership is a unique and exciting opportunity to co-develop research that immediately has impact on improving our community's resilience and ability to prepare for the future." Jane Morgan, Team Leader of Coastal Adaptation from the Council, says, "Adapting to climate change requires innovation and partnerships, and this collaboration with UC has provided us with locally built tools to identify and understand the many risks to places, infrastructure and things that are important to communities."

Timber wall research

Associate Professor Minghao Li and PhD student Ben Moerman have been testing large cross-laminated timber shear walls in the UC Structural Engineering Laboratory to find out how they behave in significant earthquakes. Associate Professor Li says the benefit of wood is that the building sector can contribute to the country's zero carbon goal. "Wood is a carbon sink; it can sequester carbon or basically absorb it from the atmosphere," says Associate Professor Li. For Ben, his "goal is to play a part in making mass timber buildings more popular and increase the use of New Zealand timber products in building construction."

552 publications based on Elsevier mapping

66% publications based on international collaboration

Based on publications from 2018 to 2022

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



**Ensure sustainable
consumption and
production patterns**



Our new Waste Plan

UC's new Waste Plan (2022-2030) sets out our waste reduction strategies, involving five key priority areas with corresponding strong reduction targets, to be measured either by annual audit, against EFTS, or both, including: reducing landfill waste stream; reducing contamination of comingled recycling stream; retaining or improving on clean organics stream; dropping the clean landfill rate; and reducing single use plastic bottle disposal drop.

Partnering for sustainable milk

UC has partnered with the region's only supplier of pasteurised A2-protein milk in returnable glass bottles. Canterbury's Choice farm uses a recycling system for water and chemicals to save on energy and waste during wash cycles. The cows are 90% grass fed, and a supplement feed of organic kale, barley and other nutritious grains, are all produced on the farm. The cows dine surrounded by natural springs and shelter belts that attract native birds, and during milking they listen to classical music. Thanks to a partnership with the Department of Conservation, bioreactors have improved water quality by over 50%; so the water leaving the farm is cleaner than when it arrived. The circular system reduces wastage and encourages reuse of materials, with glass bottles and steel kegs replacing plastic and helping to achieve their zero-waste goals.



It's back to the future for UC with milk now being delivered in reusable glass bottles

From Plastic Waste to Protective Gear

As part of #PlasticFreeJuly, School of Product Design engineering students took on the challenge of transforming plastic scraps from a 3D printer into practical products. Their mission was to create elbow pads and wrist guards for skateboarders, leading them to explore creative and technical solutions. We must engage practitioners with the creativity and responsibility of their design, says Industrial Product Design Lecturer Hossein Najaf Zadeh. "I am very pleased and proud of my students' effort, passion, and creative thinking."

Education in Sustainable Business

UC offers an extensive range of study options in sustainable business. Balancing economic benefits with environmental and social considerations is essential for long-term business success and resilience. Some of the many study options available include:

- Business, Society and the Environment
- Social and Environmental Reporting
- Managing Corporate Responsibility
- Environmental Economics
- Business and Sustainability
- Social Entrepreneurship
- Bachelor of Social and Environmental Sustainability
- Major in Sustainable Business, Enterprise and Economics
- Minor in Business and Sustainability

Waste Audit

In 2022 our annual waste audit was contracted by an external provider, to undertake a detailed audit of our waste streams. Unlike previous audits, the 2022 audit was of a mixed sample of all sites and it was therefore considered the most comprehensive waste audit that we have ever conducted.



School of Product Design engineering students. Pictured from left: Levi Painter, Joshua Wilson, and Annabel Rutherford-Levien.

In 2022, waste disposed across all categories dropped to its lowest level in ten years.

240 publications based on Elsevier mapping

75% publications based on international collaboration

Based on publications from 2018 to 2022

13 CLIMATE
ACTION



**Take urgent action to
combat climate change
and its impacts**





A new research partnership between the University of Canterbury and the University of the South Pacific will address the Pacific region's urgent requests to listen to, and share, indigenous solutions for climate change challenges. Photo: Simon Sees, Wikimedia Commons

Pacific-NZ partnership builds international climate crisis research community

The Pacific Ocean and Climate Crisis Assessment (POCCA) is a significant multi-disciplinary research project led by Director of UC's Macmillan Brown Centre for Pacific Studies, Distinguished Professor and Pro-Vice-Chancellor Pasifika, Steven Ratuva. Supported by a grant from the Ministry of Foreign Affairs and Trade, and in collaboration with the University of the South Pacific, the project involves over 100 researchers from 16 countries, as well as numerous community members. Their objective is to address the pressing climate crisis in the Pacific region and develop climate-proofing policies for the future. By focusing on resilience, adaptation, and sustainability, the project aims to understand local responses to the climate crisis. This initiative represents the most extensive climate research effort in the Pacific and is creating the largest database of climate impacts and responses in the region.

Documenting climate impacts in Samoa

Dr Christina Tausa from the Macmillan Brown Centre for Pacific Studies at UC, recently returned from a research

trip to Samoa where she interviewed families about the impacts of climate change and the adaptations they are making, which include drawing on indigenous knowledge. Dr Tausa documented physical and social challenges, such as food security and cultural impacts. "The elderly and fishermen said fish were once abundant and they could go and gather shellfish as well, but now there is hardly anything due to ocean warming. Even in the plantations, it's now really hard to grow things because there is just no rain, whereas before, the crops were abundant," says Dr Tausa. Ultimately the research will help Pacific Islanders find solutions. "We want to harmonise indigenous knowledge with scientific knowledge in a way that is practical and effective for people of this vulnerable region," says Dr Tausa.

Global effort to save Mekong Delta

Vietnam's Mekong Delta is a global agro-economic powerhouse, home to 17 million people, but rising sea levels and the unsustainable management of water and sediment could drown the delta by the end of the century. UC is part of an international team whose joint research highlighted the potential demise of the Mekong Delta and proposed solutions to prevent the loss of this valuable ecosystem. Research co-author UC's Professor Tom Cochrane has been studying the impacts on the Mekong River's ecosystems and livelihoods since 2009. The



University of Canterbury Professor Tom Cochrane (far right) next to former PhD student Thanh Duc Dang and photographed with local research partners on the Mekong Delta.

concern is that the severity and urgency of the threat to the Mekong Delta may not have reached key decisionmakers and has not been mainstreamed in planning and investments. Professor Cochrane says, "A Mekong Delta that will thrive beyond the end of this century is possible but requires fast and concerted action in a basin that's been riddled by competition, rather than cooperation, between its riparian countries."

Drones, snow radars, and climate change

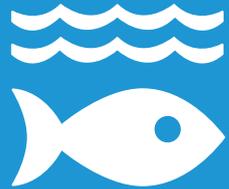
Innovative airborne radars could soon be used to measure snow depth in New Zealand's alpine areas, helping to predict avalanche risk and monitoring the impacts of climate change. The radars send signals to the ground which bounce back providing information on the thickness of snow beneath. This can be combined with satellite imagery, allowing the generation of 3D maps of snow load. The technology is being developed by a UC-led team. "The data provided by this technology, which is accurate to within just a few centimetres, could be used by ski fields, helping to predict avalanche risk and assess the safety of access roads in the mountains. It could also be used to assess snowfall changes on glaciers, find the safest areas to ski and provide information on snow melt for hydro power generation," says Associate Professor Wolfgang Rack.

259 publications based on Elsevier mapping

68% publications based on international collaboration

Based on publications from 2018 to 2022

14 LIFE BELOW
WATER



**Conserve and
sustainably use
the oceans, seas and
marine resources for
sustainable development**



When loving the sea becomes destructive

UC Distinguished Professor David Schiel presented a free public talk on the challenges and solutions for sustainable seas. The talk was part of the inaugural Tītohu Tūroa Sustainability Showcase held in October at UC. Professor Schiel is an accomplished researcher and science communicator who works with government and regional councils to ensure policy planning is based on the latest science. “We have to start doing better. If we think about sustainability collectively as a society, we have to understand where the problems lie, what parts can be managed and whether we actually want to leave something for our kids and grandkids,” says Professor Schiel.

Doing justice to place-based realities in marine research

Interdisciplinary research teams across Aotearoa are working together to uncover opportunities for oceans law and policy to better support relationships between people and the ocean, in a way that upholds Te Tiriti o Waitangi and respect for Māori rangatiratanga, rights and interests. UC academics Adrienne Paul and Elizabeth Macpherson jointly presented a seminar entitled “Ocean, Law and Policy” on their work as part of the Sustainable Seas National Science Challenge project on Law and Policy for Ecosystem-based Marine Management. The seminar was part of the UC Towards *Tino Rangatiratanga in the Law* Ngāi Tahu Centre Kā Waimaero and Faculty of Law | Kaupeka Ture Treaty Partnership Speaker Series. The presenters highlighted the challenge of their research kaupapa, and the collaborative, interdisciplinary approach they are taking to do justice to the place-based realities of ocean people and places.

Biologist hooks award for study of native fish

Dr Sarah Flanagan, from our School of Biological Sciences, won the 2022 UC Council Early and Emerging Career Researcher Award for her research focusing on genetic variation in the pipefish, a native New Zealand marine fish



Dr Sarah Flanagan, UC Early and Emerging Career Researcher Award winner.

related to the seahorse. A primary focus of Dr Flanagan’s research is to understand and explain why variations amongst species exist and what that means in response to predation and environmental changes. “The survival of this species has both an environmental and a commercial impact. It helps direct conservation management and helps us respond to climate change and human development along coastlines,” says Dr Flanagan.

Microplastics, Antarctic predators, and respiratory function

Three innovative groundbreaking UC researchers have been awarded Rutherford Discovery Fellowships. The recipients are Associate Professor Michelle La Rue for her research entitled *Southern Ocean connections: a metacommunity approach to understanding changes in the marine predator guild*; Dr Phoebe Macrae for her research entitled *Cross-disciplinary characterization of upper aerodigestive function*; and Associate Professor Laura Revell for her research entitled *Airborne microplastics in a changing climate*. Deputy Vice-Chancellor Research, Professor Ian Wright says, “The NZ\$2.4M funding highlights their national and international significance and relevance, and we are proud to support their research at UC.”

Freshwater ecosystems under threat

UC Professor Angus McIntosh, a specialist in freshwater ecology, is heading research into how climate warming is affecting our freshwater ecosystems and how to best deal with those influences in the future. “A major climate-drive threat to freshwater life in New Zealand is increased frequency and magnitude of drought. We know that river communities collapse when rivers dry completely, but we’re trying to find the early warning signs indicating when communities start that process so we can offer better advice in water allocation decisions,” says Professor McIntosh.



Professor Angus McIntosh is concerned about how climate change will affect native species such as this brown mudfish, from a South Westland tree tip-up pool.

184 publications based on Elsevier mapping

64% publications based on international collaboration

Based on publications from 2018 to 2022



Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss





UC Master's student Aaron Millar is researching ways to stop the spread of monkeyflower, an attractive North American plant that is invading pristine areas of Canterbury and Otago.

Our new Biodiversity Plan

UC is committed to improving biodiversity on campus. Our new Biodiversity Plan (2022-2025) sets out ambitious targets and actions, including improving plant diversity with a diverse range of new plantings; improving bird populations by focusing on establishing bird-friendly plants and predator control; improving stream life by focusing on stormwater treatment to benefit invertebrates and fish; improving cryptic biodiversity, with microbes, fungi and invertebrates benefiting from unmanaged areas of native plantings; improving conditions for Taonga species, and enhancing Ki uta ki tai (connections between mountains and sea).

Pretty but invasive

An invasive weed threatening to swamp our waterways is the focus of UC Master's student Aaron Millar. Colloquially known as monkeyflower, the plant is particularly prominent in Canterbury and Otago, although found throughout the country. Millar says monkeyflower grows extremely thickly and can completely fill small waterways. For his Master of Science in Biology, Millar is looking at why monkeyflower is so successful in such a range of environments. Monkeyflower, more formally known as *Erythranthe*

guttata, was introduced to Aotearoa New Zealand by pakeha settlers in the colonial period. Originally from North America, it was kept as a garden plant in Britain, and they liked the look of it enough to bring it here. Scotland is also fighting its invasive impact.

20-year quest to restore rare African forest

UC's Associate Professor Hazel Chapman is the powerhouse behind the Nigerian Montane Forest Project, which she established at Ngel Nyaki 20 years ago. On a remote Nigerian plateau, in one of Africa's rarest ecosystems, sits a model for biodiversity conservation that has created local jobs, accommodated PhD students, produced valuable research, discovered new species, and given hope to the community for a better future for their children. It's the community involvement that Associate Professor Chapman is most proud of: "the project has 36 well-trained, full-time employees, all on good salaries, the village has a nursery school, the forest is growing back, and hunting is considerably reduced".

A wildflower meadow trial project was initiated, to support and enhance invertebrate life on campus.

A biodiversity walk on campus was held to acknowledge World Biodiversity Day.

81 trees were planted in 2022, mostly along UC waterways.

3D printed bug raising awareness

Two UC students in our School of Product Design spent their summer developing and 3D printing a larger than life-size model of the brown marmorated stink bug to help raise awareness of the potential for a costly invasion of the pest in the country. The project was part of the Better Border Biosecurity (B3) summer studentship programme, a collaboration involving New Zealand Crown Research Institutes, universities, government, industry, Iwi and other stakeholders, that aims to strengthen the country's biosecurity system and protect valued native flora from invasive pests.

Trees, worms, and learning

Holes were dug and worms were wondered over as Ilam Primary School children planted native trees on our Ilam campus next to their school. UC groundskeepers Darryl Cone and Richard O'Dowd, with landscape ecologist Adjunct Professor Colin Meurk, advised and assisted the planting efforts. UC Envirosoc students, an environmentally focused student club, and the Student Volunteer Army helped to dig holes and support the younger landscapers. The planting connects to previous planting on Ilam campus as part of UC's aim to increase natural habitats for native birds, lizards, and insects on our grounds.

357 publications based on Elsevier mapping 60% publications based on international collaboration

Based on publications from 2018 to 2022

16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels



Forging closer ties with NZ Police

UC and the NZ Police have formalised a Memorandum of Understanding (MOU), signed by the Vice-Chancellor, Professor Cheryl de la Rey, and NZ Police Commissioner, Andrew Coster. Professor De la Rey said, “We have a shared goal of improving our understanding of criminal justice matters and the MoU is particularly relevant to the University’s Faculty of Law and our innovative Criminal Justice programme. However, there are other disciplines and faculties that will also contribute to this significant partnership.” Police Commissioner Coster said the MoU helps formalise the working relationship between UC and Canterbury Police, as well as Police nationally. “Police work is increasingly evidence-based, so it makes sense to partner with leading tertiary institutions like UC, which can contribute new research and a critical eye to policing and justice issues. Strong partnerships, like those being formalised in the MoU, can ultimately help make our communities safer. NZ Police’s mission is to prevent crime and harm through exceptional policing. It’s therefore vital we understand what works to achieve this outcome,” said Commissioner Coster.

Studying Criminal Justice

UC’s unique undergraduate degree in criminal justice, the Bachelor of Criminal Justice, is the first of its kind in Aotearoa New Zealand. New Zealand Police has been part of UC’s Board of Studies for the Criminal Justice programme for the past eight years. The New Zealand Police Commissioner Andrew Coster says, “It’s been great to see the Bachelor of Criminal Justice degree go from strength to strength.” Students interested in criminal justice can also undertake these exciting new qualifications:

- Certificate in Criminal Justice
- Graduate Diploma in Criminal Justice
- Master of Criminal Justice



University of Canterbury Tumu Whakarae | Vice-Chancellor Professor Cheryl de la Rey and New Zealand Police Commissioner Andrew Coster signed a Memorandum of Understanding formalising a positive partnership between the two organisations.

Palgrave Macmillan Lecture

The 2022 annual Palgrave Macmillan Lecture event looked at the relationship between the humanities, social sciences and the current international picture, and asked the question: How can the Humanities and Social Sciences contribute to the Peace Agenda? The keynote speaker was UC’s Professor Steven Ratuva, Director of the Macmillan Brown Centre for Pacific Studies, and Vishal Daryanomel, Senior Editor from Palgrave Macmillan in Singapore, gave a talk on Publishing and the Peace Agenda: the role of the humanities and social science.

European Foreign and Security Policy

This short course, offered by the National Centre for Research on Europe (NCRE) at UC, examines current European Union foreign policy activities which include peace and reconciliation interventions; a growing security role for Europe in terms of an autonomous EU military capacity; and an international diplomatic role. NCRE is Aotearoa New Zealand’s only research centre devoted to the study of Europe and the European Union and attracts visiting academics from all over the world

International Human Rights

This course, offered by our Faculty of Law, provides students with an introduction to international human rights law and the international human rights framework in the Aotearoa New Zealand context. Students are familiarised with the core legal instruments and institutions relevant to the protection and promotion of human rights at the international level, along with some of the topical issues and controversies. Other issues covered are the historical origins of the human rights idea, major multilateral human rights treaties and institutions within the UN system, and the links between international human rights and domestic implementation.

Centre for Entrepreneurship

The Centre for Entrepreneurship at UC offers programmes to support the development of social enterprises that promote peace and justice. The Centre’s aim is to deliver highly versatile graduates who can contribute to society in a meaningful and positive way. All activities at the Centre are connected with external organisations, enabling students to gain real world hands-on experience. Programmes and events are open to all UC students regardless of the degree or year. No prior experience is required.

182 publications based on Elsevier mapping

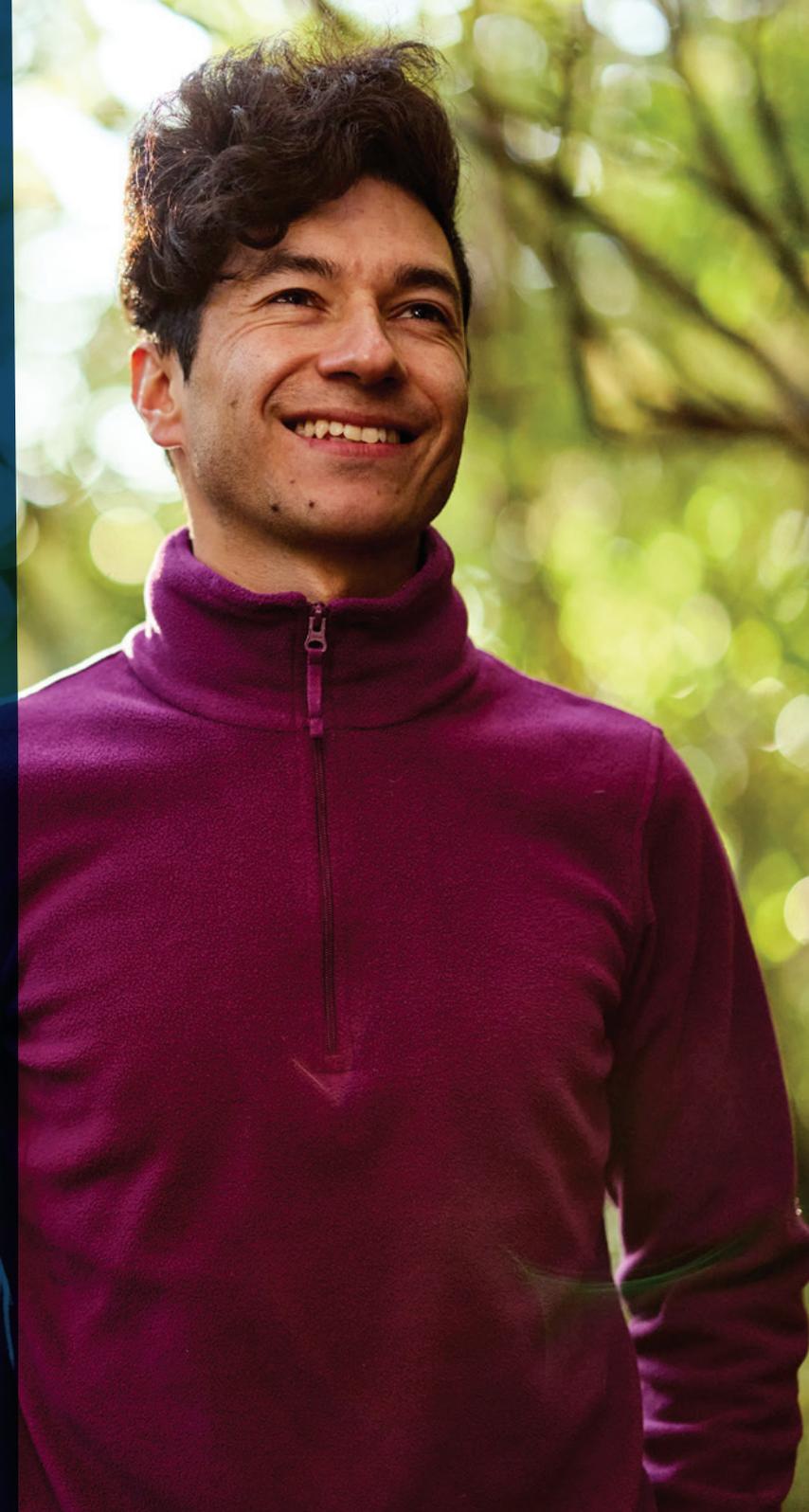
51% publications based on international collaboration

Based on publications from 2018 to 2022

17 PARTNERSHIPS
FOR THE GOALS



**Strengthen the means
of implementation
and revitalise the
global partnership for
sustainable development**





Tītohu Tūroa Sustainability Showcase

Tītohu Tūroa Sustainability Showcase

In October 2022, UC and the Christchurch City Council proudly presented research and action towards creating a more sustainable future, called Tītohu Tūroa | Sustainability Showcase. The in-person and on-line free event was open to the general public and UC community. Ten presentations featured the latest research and local developments given by experts from UC and Council across many sustainability issues, including transport, food waste, coastal adaptation, affordable energy, and urban forest planning. The event gave people the opportunity to hear from top speakers driving sustainability outcomes locally and nationally, such as Chair of the Climate Change Commission Dr Rod Carr, Pou Whakarae Ngāi Tahu Centre Professor Te Maire Tau, and Christchurch Airport Chief Executive Malcolm Johns, including leading academics, Christchurch City Council staff, postgraduate students and business leaders. In the lead up to the event, Council Assistant Chief Executive Lynn McClelland said, “Tītohu Tūroa | Sustainability Showcase celebrates the strong partnership between Council and the University and is an opportunity to showcase the initiatives we are driving together” and UC Pro-Vice-Chancellor Sustainability Professor Jan Evans-Freeman said, “the mix of speakers

from academic, planning and business backgrounds will discuss urgent sustainability challenges such as reducing carbon emissions, equitable access to energy, te ao Māori and Pasifika perspectives and how young people can better participate in sustainability conversations.”

Adaptation of Agroecosystems to Climate Change

UC hosted a two-day scientific conference on research activities and collaborative projects between New Zealand, French research organisations and universities to answer questions for these two countries and in the Pacific territories. The aim was to present research and share the knowledge between international teams working on climate change impacts and adaptation of agroecosystems, discuss issues and adaptation strategies for agriculture and forestry, and explore future joint research projects and initiatives on adaptation of agroecosystems to climate change.



The University is supporting the 2025 Special Olympics National Summer Games by providing accommodation in its halls of residences.

Increasing our presence and impact

We continue to deliver a wide range of experiences for the public in Ōtautahi Christchurch and Waitaha Canterbury. UC Connect, our popular free public lecture series, offers topical, educational public lectures by experts in their fields and leading thinkers. UC Connect public lectures is one of many experiences we offer to the public. Some other experiences include the BrainDate series, MBA Thought Leadership Series, memorial and sponsored lectures, art exhibitions at the Ilam Campus Gallery, recreation services in the gym, music performances, and free MOOCs.

Supporting the 2025 Special Olympics

Christchurch has secured hosting rights for the 2025 Special Olympics National Summer Games, which will be held for three days in December that year. Around 1300 athletes will compete in 11 different sports. UC is partnering with four specialist accommodation providers to operate 10 halls of residence and apartment facilities, offering over 2,700 beds on campus. Some of these halls will be utilised to accommodate athletes, volunteers, and support staff during the event.

188 publications based on Elsevier mapping

68% publications based on international collaboration

Based on publications from 2018 to 2022

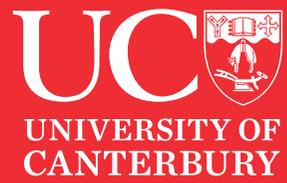




About this document

This is the University of Canterbury's third document produced on our commitment and engagement in support of the United Nations Sustainable Development Goals (SDGs). Our approach for this document is to identify and summarise our activities and outcomes that most closely align with the SDGs, through our core functions of research, education, engagement, and operational activities, across the campus. Our activities and outcomes provided in this document principally cover the 2022 calendar year.

The material is substantiated with metrics (quantitative) and case studies (qualitative). For quantitative data on publications, searches related to the SDGs were conducted on the Scopus database using the keyword search terms created by the Elsevier methodology. Courses aligned with particular SDGs were identified by consulting with Course Coordinators across campus about the type and quantity of SDG-related content in their courses and auditing the results with reference to course learning outcomes and course assessment. For qualitative data, case studies that most closely aligned with producing outputs for the SDGs were selected by a variety of ways, including through a consultation process, conducting a review of our website, consulting with operational directors and managers, and gathering input and feedback from a range of UC staff and students with particular expertise.



150 years
1873–2023