

THE UNIVERSITY OF
AUCKLAND
NEW ZEALAND

A HEART IN THE PACIFIC WITH A GLOBAL OUTLOOK

The University of Auckland
SDG Report 2021





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End poverty in all its forms everywhere



Student accommodation in Waipārūrū Hall

In 2020, the University opened Waipārūrū Hall, an award-winning student accommodation facility. The 786-bed residence is designed to be a home-away-from-home for students, that promotes a sense of community and facilitates pastoral care. Through facilities such as this, the University provides a pathway to study for students who might otherwise experience challenges in finding accommodation in Auckland.

Benefit boosts negated during lockdown

Dr Louise Humpage, from the University of Auckland's School of Social Science, conducted research examining the experiences of income-support recipients during the national lockdown in 2020. She drew attention to the fact that existing policies and clawbacks largely eliminated the benefit increase that occurred in April of that year, and that many participants reported feelings of stress and stigma in accessing their entitlements. She hopes to encourage government to ensure that adequate and equitable levels of support are available to everyone who needs it.



Dr Louise Humpage

Staff assist with Auckland City Mission collection

University staff co-ordinated collection sites for the Auckland Angels City Mission collection as part of the annual Volunteer Impact Week. The project gathers a wide range of products for families in need, including non-perishable food items, hygiene products, and toys. Initiatives such as these are vital in the uncertain conditions created by recent global events.

Pre-school injuries linked to disadvantage

Associate Professor Bridget Kool and colleagues are conducting research as part of the [Growing Up in New Zealand](#) study examining the drivers of childhood injury, and have identified a significant link with poverty. This could mean strictly material deprivation or parental unemployment, but could also mean related socio-economic factors, including overcrowded living conditions, inadequate or low-quality housing, or parental mental illness. Through this work, the team hopes to highlight the need to address poverty as part of efforts to combat childhood injury.

New scholarships, prizes and awards

Funding from University of Auckland staff, friends and alumni is used to resource the hardship scholarships, to fund the study of promising students who would otherwise not be able to afford tertiary study. Numerous other funds are resourced by the same generous giving, including funds to support student well-being, research into areas of critical social or economic need and scholarships to support students from minority and refugee backgrounds.

Food hardship study

Dr Sarah Gerritsen from the School of Population Health led a study on food poverty, using data from the Growing Up in New Zealand cohort study, in collaboration with the Department of the Prime Minister and Cabinet, Ministry of Health and University of Otago. The researchers found that signs of food hardship such as the household using a foodbank were most prevalent during the critical first year of an infant's life. The study demonstrated a link between food hardship and poorer child nutrition (e.g., eating a smaller variety of fruit and vegetables and having a higher intake of unhealthy foods and drinks). This research showed the importance of targeted financial assistance for parents of younger children.

Period-poverty initiative

The University has launched a period-poverty initiative, funded by staff, to assist young women who might otherwise struggle to purchase menstrual products. Associate Professor Terryann Clark from the School of Population Health notes that in times of financial stress, menstrual products are one of the first items that struggling people will stop buying. Not having access to these products can lead to infections and other medical problems, as well as to the affected person missing work or school. Through this initiative, the University hopes to promote the health and well-being of its students, as well as their academic success. The initiative is also complemented by an official student club, the Feel Good Period Club, which facilitates students helping one another by donating menstrual products to those in need.



The University offers over 80 different scholarship and financial aid packages that are targeted towards students with financial need, including those from low-income areas, refugee backgrounds, and students who are the first in their family to attend University.

68

publications based on
UoA queries

35%

national share of publications
based on UoA queries

26

publications based on
Elsevier mapping

12

courses based on
UoA queries

Key SDG research and education statistics in 2020



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



In addition to the specific initiatives discussed here, the University also offers a wide range of culinary options for staff and students. At the central City Campus alone, cuisine is available in Indian, Chinese, Japanese and Mexican styles, with options available for gluten free, vegetarian, vegan and halal diets. Moreover, in recognition of the differing financial means of our student body, there are many food items available to fit within any budget.

“Dietary practices in early life represent a unique opportunity to tackle not only childhood overweight and obesity, but the subsequent diet-related diseases can present in adulthood.”



- Dr Gontijo de Castro,
Senior Research Fellow, Faculty of
Medical and Health Sciences

Dr Teresa Gontijo de Castro

Infant feeding guidelines and childhood obesity

Dr Teresa Gontijo de Castro and co-authors used the Growing Up in New Zealand cohort data to examine how closely the parents of infants follow official dietary guidance for their children, and whether diet during infancy is associated with child obesity. The guidelines cover feeding practices such as duration of breastfeeding, age at which babies start solid food, fruit and vegetable intake, addition of salt and sugar to food, eating iron rich food, and consumption of inappropriate drinks. They found that only a small percentage of families follow all the advice (2 percent), and a sizeable minority follow less than half of the guidelines (15 percent). The study also found that the third of children with the lowest adherence to infant feeding guidelines were the most at risk for childhood obesity at four-and-half years of age. The researchers note that poor nutrition in early childhood can set a person up for significant diet-related health problems later in life, and so a carefully planned infant diet is critical.



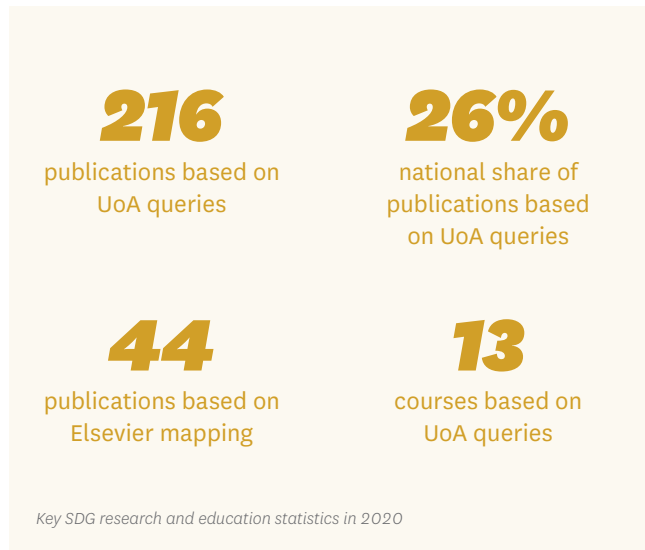
Professor Wayne Cutfield (back, at right)

Nutritional supplementation reduces risk of pre-term birth

Professor Wayne Cutfield represented the University of Auckland in a global study on nutritional supplementation for women prior to conception and during pregnancy spanning New Zealand, Singapore, and the United Kingdom. This research was one of the most intricately conducted studies in pregnancy ever performed, and found that comprehensive nutritional supplementation contributed to fewer pre-term births, particularly cases linked with ruptured membranes.

Better Kai

An initiative from the Department of Nutrition and Dietetics has worked with food retailers on campus to identify “Better Kai [food]” with a simple labelling system that enables staff and students to easily select healthy, nutritious food items. The system is designed to be easy-to-use, and does not require expert knowledge on the part of the retailers.



Maara Fresh: giving back to the Manurewa community

Maara Fresh is a social enterprise backed by the University’s Centre for Innovation and Entrepreneurship. The purpose of Maara Fresh is to provide structure for initiatives run out of the Manurewa Community Garden to ensure that they are financially stable. The garden itself provides food for local families, community kitchens and food banks.

Greening our food production and supply chains

The Centre for Green Chemical Science at the University works explicitly towards ending food insecurity, with a particular focus on reducing food waste. This could be, for example, by finding innovative ways to keep food fresh for longer, such as slowing down the ripening and decay of fruits and vegetables, or minimising freeze-damage to meats, or it could be by finding new ways to use waste products, such as the uneaten shells of edible crustaceans. The team is committed to achieving these goals in a way that minimises any environmental impact.

Dietary interventions: evidence and translation (DIET)

Funded by the Health Research Council and headed by the University of Auckland, the DIET programme is an ongoing series of research projects aimed at promoting healthy eating patterns. The DIET team works closely with food retailers to look at product placement and promotion and to evaluate food-labelling practices. Other projects include cataloguing nutritional data for foods sold in New Zealand, investigating the impact of low-sodium diets, and supporting organisations to implement healthy eating policies.

The first 1,000 days of dinner

As part of the Growing Up in New Zealand study, Professor Clare Wall and her colleagues (Dr Teresa de Castro and Dr Sarah Gerritsen) have been analysing data to describe what children are eating in the first 1,000 days of life and to understand what factors are associated with the risk of being an overweight or obese child in New Zealand. New Zealand has some of the highest rates of childhood obesity in the world. The research considers a range of factors, including what is eaten, why and how it is eaten, and the sociodemographic and environmental factors that influence access to food. Professor Wall hopes this research will inform practice and policy to help reverse this trend, and to safeguard the long-term health of New Zealand’s children.



Professor Clare Wall



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



Sarah Mwashomah, Anzel Singh and Weilian Du

OPUM technologies and the digital knee

Associate Professor Andrew McDaid (Engineering) has developed a wearable product that collects real-time data about knee health, and uses AI to drive improved decision making for medical personnel dealing with patients suffering from knee injuries. Dr McDaid hopes that his device will improve outcomes for patients and facilitate the work of clinicians.

The facts about gout

Professor Nicola Dalbeth is a University of Auckland researcher, a specialist rheumatologist at Auckland District Health Board and the President of the New Zealand Rheumatology Association. Her work focuses on effective treatment of gout, the most common form of inflammatory arthritis, and also on challenging the stereotypes and stigma associated with the disease, which often paint an inaccurate and negative picture of gout sufferers.



Professor Nicola Dalbeth

Rapid Covid-19 immunity test

Professors David Williams and Cather Simpson and Dr Matheus Vargas (all from the Faculty of Science) have developed a quick, accurate and cost-effective method for testing a person for Covid-19 as well as Covid-19 vaccine efficiency. Their hope is that this technology will facilitate safe travel around the world during the pandemic, by allowing people to rapidly understand their immunity status.

In 2020, the Faculty of Medical and Health Science, the biomedical Liggins Institute, and the Auckland Bioengineering Institute performed \$125 million of externally funded research.

University leads Covid vaccine monitoring

UniServices, the University's commercialisation subsidiary, was awarded around NZ\$8 million by the United States Centers for Disease Control and Prevention (CDC) to support the Global Vaccine Data Network (GVDN) in assessing the safety of Covid-19 vaccines over a three-year period. The University's responsibility will lie in co-ordinating the programme, which involves more than 17 countries and hundreds of millions of people around the world. This has recently been expanded to include a significant sub-award associated with funding from eight African countries. Associate Professor Helen Petousis-Harris is a vaccinologist in the Faculty of Medical and Health Sciences and is both the lead investigator and co-director of the GVDN. She describes this programme of work as an important complement to the pre-deployment clinical trials used to authorise the use of the vaccines.



Dr Helen Petousis-Harris

Staff health benefits

The University of Auckland is committed to protecting and supporting the health of its staff. As part of this commitment, all permanent staff are provided with a number of healthcare-related benefits. These include a free employee assistance programme, where staff can work through personal or work-related problems with a licensed mental health professional, free annual flu vaccinations, discounted health insurance and discounted optometry check-ups.

Children 'scientists' and indoor climate

As part of the Growing Up in New Zealand longitudinal cohort study, a project was designed in collaboration with BRANZ (the Building Research Association of New Zealand), involving more than 2,000 eight-year-old children collecting temperature and humidity data at home and school over two days. This novel data was then aligned with existing environmental and health metrics collected over time as part of the study, to provide individual level data. In turn, the combined data was used to support international findings that children's health is best served by a warm and dry home environment (particularly the bedroom) between 19 and 25°C with a relative humidity of 50 percent. The study also demonstrated that only half of young New Zealanders experience these conditions.



Professor Elizabeth Broadbent

My 'little friend': robots in retirement villages

Professor Elizabeth Broadbent and a team from the Centre for Automation and Robotic Engineering Science conducted research into how elderly retirement home residents evaluated the experience of having a robotic assistant in their homes to remind them when activities and medications were due, and to deliver cognition-

improving games. Professor Broadbent found that most residents appreciated the robots' presence, and commented that when the younger and more technologically savvy generations retire, they will expect such technologies.

VR to assist autistic people into work

Sarah Mwashomah, Anzel Singh and Weilian Du founded a start-up, while students at the University, that uses virtual reality to help people on the autism spectrum practise for work-related scenarios such as job interviews. The team is also working on a product to allow employers to better understand situations from the perspective of an autistic person. Their work has been recognised as mSchools SDG Challenge Finalists at 4YFN of Mobile World Congress in Spain, and has won funding from the Westpac New Zealand Government Innovation Fund.

Using AI to innovate the future of cardiology

University of Auckland alumnus Will Hewitt founded a start-up to market an AI system he conceived while a student that analyses echocardiograph data. Instead of doctors needing to spend a considerable length of time manually viewing and annotating 30 minutes of internal imaging, the software automatically calculates the main measurements and highlights particular elements of the recording that it thinks the clinician would find useful or relevant.

Student Well-being Ambassadors

The University has launched a Student Well-Being Ambassador programme which appoints student ambassadors to promote healthy behaviours, and to challenge bullying, harassment and discrimination. The programme is based on the fundamental principles of health promotion that initiatives should be co-designed with, and intimately involve, the community in question (in this case, students).

Motor neuron disease in New Zealand

New Zealand has unusually high rates of Motor Neuron Disease (MND), which is an incurable and rapidly fatal degeneration of the neurons that control muscles. Sufferers experience creeping paralysis, eventually losing the ability to walk, talk, swallow or even breathe. Dr Emma Scotter, who heads the Motor Neuron Disease Lab at the University, is contributing to a large-scale genetic study that will try to understand which 'rogue genes' are present in the New Zealand population that might be contributing to our elevated rates of MND. She hopes to identify genes already found to cause MND in international studies of European and Asian people, as well as any previously unidentified genes found in New Zealand Māori and Pacific populations. Identifying the particular gene or genes in a sufferer can help link them with the appropriate experimental gene therapy.

A super model for the team of 5 million

Dr Dion O'Neale, applied mathematician and lecturer in Physics, is working on an enhanced model for mapping the complex connections between New Zealanders. Such modelling played a pivotal role in New Zealand's initial Covid-19 response through Te Pūnaha Matatini (TPM) research centre. Although the concept may sound simple, the number of possible connections between members of a population of five million ranges into the trillions. Dr O'Neale and his colleagues at TPM are working to enhance this model for use in a world where Covid-19 is likely to be with us for many years to come. A particular strength of the new model is that it is able to take into account the fact that different population groups bear a different burden when it comes to transmission and health outcome risks, allowing a focus on target equity groups.

Covid and the virtual lung

Professor Merryn Tawhai of the Auckland Bioengineering Institute is developing a form of virtual lung that can be used to trial treatments on a virtual representation of a patient's lungs. When large numbers of patients with Covid-19 end up in an intensive care unit, there is often a need to ration medical resources such as ventilators. Naturally, this is a significant ethical quandary for clinicians, and at present, decisions are based largely on clinical signs and measurements that only become apparent when significant damage has already been done. Professor Tawhai's work aims to facilitate these decisions, so that the greatest possible number of patients can recover.

The Covid time machine

Associate Professor Nikki Moreland heads a team that has developed tools to detect Covid-19 antibodies. While the standard swab test can tell you who is currently infected with Covid-19, antibody testing can identify those who may have been infected weeks or months prior, long after the virus is no longer detectable in their body. Dr Moreland and her team were able to ensure that, no matter what might happen to global supply chains, New Zealand was able to rapidly produce the key components for these tests in-country. They have since used their antibody tests to do a large-scale survey of 10,000 blood donors in New Zealand to provide further evidence of the country's success in keeping Covid-19 levels down, and continue to investigate Covid-19 immunity using the antibody technology they developed.

2,053

publications based on UoA queries

34%

national share of publications based on UoA queries

924

publications based on Elsevier mapping

421

courses based on UoA queries

Key SDG research and education statistics in 2020



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

SDG 4 Hub

In 2020, the University of Auckland was appointed as the global SDG Hub for SDG 4 (Quality Education). This has since been extended to May 2024, and is a significant recognition of the University's contribution to this SDG. Only 17 hubs (one for each SDG) are chosen globally, with each hub responsible for engaging with more than 1,000 institutions in more than 130 countries.

STEM online NZ

The University is developing the STEM Online platform, which is a collection of free interactive teaching and learning resources aimed at high-school students who are studying STEM (science, technology, engineering and mathematics). The platform offers lessons in various physics, chemistry and mathematics standards, with work ongoing to include more. This initiative is the University's way of leveraging technology to help offset an ongoing shortage of STEM teachers in New Zealand high schools.

24/7 Student study places

The University is piloting an initiative to make the Kate Edger Information Commons available to students 24/7. This facility includes around 100 computers and group study spaces for up to an additional 260 people. This is in response to student feedback that suitable study spaces for undergraduate students needed to be available outside the usual hours on offer.



Student-led project aims to raise consciousness

In 2021 Drs Elizabeth Peterson and Shiloh Groot were awarded a Teaching Initiatives Grant and Faculty of Science Equity Grant to develop a pilot project entitled the 'Solidarity and Belonging Module.' Working alongside student Rodolfo Villanueva and Dr Maggie Brown, they are collecting staff and student stories that relate to equity experiences on campus, which they will use in a workshop to be piloted with psychology students. The workshop aims to go beyond merely raising awareness of equity issues by supporting students to engage in acts of solidarity, belonging, and fostering collective well-being.

360 International virtual programme

When borders closed because of Covid-19, the University 360 International team rapidly transitioned to a virtual model. Since then, hundreds of University of Auckland students have been able to remotely participate in courses and certifications at institutions around the world, spanning a wide range of subjects including literature, cultural competence, Indigenous studies and computer science.

In 2020, the University had 6,787 students of Māori and/or Pacific origin. This includes 2,185 students from low socio-economic backgrounds (i.e. school leavers from Decile 1, 2 or 3 secondary schools).

Dedicated space for students with disabilities

The University has opened a new facility where students with disabilities can rest, recharge, and seek support and guidance. The facility includes mechanised door openers, height-adjustable lockers, visual fire alarms, standing desks, and mechanisms for enlarging text.

Disaster resilience in schools



Professor Carol Mutch

Professor Carol Mutch works with schools to improve their readiness and response to increasingly common natural disasters, and to understand the impacts and trauma on students and staff alike. Her award-winning work has taken her to schools around the world, including Japan, Nepal and Australia following earthquakes, tsunamis and bushfires.

In recent times, she has broadened her scope to look at the impact of Covid-19 on schools. Her ultimate goal is to facilitate the important role of schools as community hubs in the immediate aftermath of natural disasters, and to support the staff and students to find a new normal.

Venture empowering young Kiwi innovators

Associate Professor Suranga Nanayakkara of the Auckland Bioengineering Institute has created an educational start-up Kiwrious, which aims to encourage enquiring young minds to take an interest in the natural world. The start-up provides a low-cost sensor kit to allow students to test the world around them and obtain various scientific readings, including light, UV, temperature, humidity and air quality. Kiwrious also provides teacher resources, and a platform for students to log and compare their results. Dr Nanayakkara hopes this product will bring a love of science to students from a range of backgrounds.

Vietnam study hub

The impact of Covid-19 has meant that many of the University's international students are unable to enter New Zealand, and are consequently unable to attend classes in person. One way the University is working to support these students is via the establishment of study hubs in key partner countries, such as Vietnam. In Ho Chi Minh City, the University has partnered with LightPath and UP Education to establish a study hub, where international students can gather with their peers, study and receive learning and career support at no extra cost. The University is committed to the long-term maintenance of these hubs, in that they also provide students who are studying online-only programmes with the option to remain in their home country if that is their preference.

312

publications based on UoA queries

36%

national share of publications based on UoA queries

118

publications based on Elsevier mapping

137

courses based on UoA queries

Key SDG research and education statistics in 2020



Achieve gender equality and empower all women and girls



Professor Dawn Freshwater, Vice-Chancellor, The University of Auckland

Clothing drive for a gender-affirming wardrobe

An initiative was launched where staff and students could donate unused clothing items for students who were exploring their gender identity or who were actively transitioning. The intention of the project is to provide a safe place where gender-diverse students can obtain gender-affirming clothing, without needing to shop in strongly gendered retail outlets.

Insights from women entrepreneurs

Dr Janine Swail, senior lecturer in Entrepreneurship and Innovation, conducted research into the experiences of women entrepreneurs who were raising equity investment for their ventures. The report exposed some of the challenges that women experienced during this process as well as their expectations of investors in the New Zealand entrepreneurial ecosystem. The study revealed the gender bias at play, both conscious and unconscious, in New Zealand's investment scene and highlighted seldom-acknowledged pressures on women entrepreneurs from gendered role expectations at home. Some participants were questioned about marital status and their intentions to have children – areas deemed illegal in employment interview scenarios, but considered legitimate questions in investor pitches. Support structures and responsibilities within households can both hinder and help women founders' abilities to successfully raise finance, with women often renegotiating their role within the household and relying on supportive partners to 'step up' at home. Dr Swail says to enact change for women entrepreneurs in Aotearoa, there's a need to challenge entrepreneur stereotypes, develop more inclusive investor networks, and to talk more openly about how society can challenge gendered role expectations.

New chair for women in entrepreneurship

A new Chair for Women in Entrepreneurship position in the University of Auckland Business School has been funded by business leader Theresa Gattung. The chair will focus on empowering female business students by linking analytical skills with real-world business and financial acumen. The position is explicitly oriented toward SDG 5, with the aim of improving women's participation in the economy.

The 'Choose to Challenge' event

The Faculty of Arts hosted the 'Choose to Challenge' event in celebration of International Women's Day. The event included seminars on a range of topics by University academics, as well as a break-out session facilitated by the Campus Feminist Collective. The event gave students the opportunity to consider issues of power, activism, and gender in politics.

Professor Cindy Kiro

In 2021, the University's Pro-Vice Chancellor Māori, Professor Cindy Kiro, left to take up a position as head of the Royal Society Te Apārangī. However soon after she was sought to become the next Governor-General of New Zealand, making her one of very few women to have held this post, and the first woman of Indigenous Māori heritage. The Governor-General is a ceremonial post, representing New Zealand's technical head of state, Queen Elizabeth II, but has a significant public presence.

New Pro Vice-Chancellor (Māori)

Taking over from Professor Kiro as Pro-Vice Chancellor Māori in April, Associate Professor Te Kawehau Hoskins has her own substantial history of academic excellence in the Faculty of Education and Social Work. She was involved in teaching both undergraduate and postgraduate students, and is the former Head of Te Puna Wānanga, the school of Māori and Indigenous Education.

Popularity and prettiness on social media

Dr Eunice Price's PhD was on gender and social media. She was interested to see if attributes such as beauty and popularity were favoured over intelligence and academic achievement, despite a nominal societal emphasis on female empowerment. Her findings indicated that high-achieving female high-school students felt enormous pressure to succeed, while also being compelled to cultivate a particular image focused on having a certain type of appearance and a certain type of life. The participants also commented that they felt that the stereotype of an intelligent woman was caught up with ideas of beauty, such that a woman could only be smart if she was also beautiful. Participants from minority ethnic groups, particularly Māori, Pacific and Indian women, also reported feeling like they were seen as exceptions to the rule with regards to their success, creating challenges for them in navigating social spaces that celebrated young women's intellectual achievements. Dr Price hopes that her research will encourage society not to take skilled young women for granted, and to help them avoid the pitfalls of social comparisons online.



Dr Eunice Price

In 2020, 58% of the University's total workforce were women, including 48% of academic staff.

69

publications based on
UoA queries

30%

national share of publications
based on UoA queries

68

publications based on
Elsevier mapping

35

courses based on
UoA queries

Key SDG research and education statistics in 2020



Ensure availability and sustainable management of water and sanitation for all



Plumbing the depths of water sustainability

Leaks in Auckland's potable water system cost the city tens of millions of litres a day. Although this rate is not bad by global standards, or compared to other cities around New Zealand, it is still an added strain on a limited resource and a struggling infrastructure. Professor Kobus van Zyl, the Watercare Chair in Infrastructure, works with the public sector to identify pipes with the highest risk of leakage in Auckland's water system. He and his colleagues use technology they developed to understand where in the complex underground system leaks occur and how severe they are.



Professor Kobus van Zyl

Sensing our sewer systems

Dr Wei-Qin Zhuang, a senior lecturer in Environmental Engineering, and his team have developed a flushable sensor that can be sent into the sewerage system to identify blockages and illicit connections. Methods for identifying such problems are expensive, time-consuming and often labour intensive but the technology developed by Dr Zhuang's team is low-cost (about \$2 per tag), high-throughput and allows precise mapping of the network. This invention is aimed at better protecting beaches and recreational waters from pathogenic microbe pollution caused by illicit sewage-stormwater connections and sewage overflow. The team is working closely with Auckland Council to conduct a pilot in an Auckland neighbourhood.



Dr Wei-Qin Zhuang (middle)

Real-time water quality monitoring

New Zealand Product Accelerator member Dr Harshpreet Singh of the Faculty of Engineering is collaborating with Dr Khalid Arif at Massey University and NZ Product Accelerator business manager Brian McMath to develop a cloud-based multi-sensor system for identifying water-quality issues in real time, as they arise. The team was awarded the UN Sustainable Development Prize from the University's Velocity entrepreneurship development programme.



Restoring the Waimatā River

A trans-disciplinary team from the University has launched 'Let the River Speak,' a three-year Marsden-funded project focused on the Waimatā river in Gisborne. Inspired by Māori ideas of rivers as ancestral beings with their own legal rights, the project is working with mātauranga Māori (Māori knowledge) and a wide range of disciplines to understand the life of the river through time, and with iwi (kin groups) and other community groups to restore the Waimatā to a state of ora (health and well-being).

Atmospheric rivers, water availability and extreme rainfall

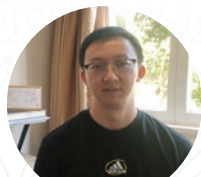
A study led by the University of Auckland has investigated 'atmospheric rivers', large, flowing bodies of water vapour in the atmosphere that are common at the latitudes where New Zealand is located. Changes in the frequency of these events can be associated with both droughts and floods, and so there is a significant public and economic interest in tracking and understanding the phenomenon.



Dr Assad Shamseldin



Evan Weller



Jingxiang (Ted) Shu



“We only have so much water available. We have a growing economy and population and we have to share water with the environment as well.”

Professor Kobus van Zyl, Faculty of Engineering

Praise from Watercare

The University of Auckland was acknowledged for its water-saving efforts by Watercare, the Auckland council-owned business responsible for providing potable water in the city. Over the past few decades, the University has managed to reduce its water consumption, despite student numbers increasing substantially in that time, to current levels of around 40,000 individuals.

Kaitiaki of the Waipā

Dr Meg Parsons and Associate Professor Karen Fisher led a Marsden-funded research project into how Māori perspectives are influencing the management and restoration of the badly degraded Waipā River in Waikato. Against the wishes of generations of Ngāti Maniapoto Māori, the river was subjected to contamination and run-off, and the associated wetlands were drained because they were seen as unproductive. Drs Parsons and Fisher hope that Indigenous perspectives can both restore and protect the Waipā going forward.

Detecting plastic in our diets

Forensic Science student Liam Philip who completed his masters degree supported by a Sustainability Research Award, investigated the presence of plastic in food and drink, with a particular focus on beverages, including bottled drinking water. Liam found that a significant proportion of the beverages assessed contained Polyvinyl Chloride (PVC) and/or Polyethylene (PE). He hopes his research will inform the public about how much plastic it is consuming and encourage ways to prevent it.

Water-saving initiative

Ngā Wharenoho (accommodation) conducts an annual Green Your Room challenge with students who live in the halls of residence, with more than 2,000 students (65 percent of the total population) participating in 2020. The challenge encourages students to commit to small day-to-day activities to reduce their water consumption, such as not taking more than four minutes in the shower, or only washing full loads of laundry.



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



Leading the charge towards change

Associate Professor Nirmal Nair and his collaborators are working on a number of energy-related projects that aim to help reduce New Zealand's carbon emissions. One of the most ambitious is a plan to reduce waste in the system that occurs as a result of having a centralised AC system that feeds an increasing number of DC devices in consumers' homes. They hope to develop a system to build up a grid-of-grids, where each local neighbourhood forms a sub-grid with its own AC/DC convertor, rather than each individual device (for example, a laptop) having its own adaptor.

Democratising energy sharing

Engineering students Michael Allison and Natasha Humphries were the recipients of the Velocity Commercial Prize for their business idea "Empower". Their plan involves people with solar powers using an app to automate the sale of unused electricity generation to their neighbours, with the ultimate goal of democratising and localising the sharing of electricity.



Energy Economics Summer School

Every year, the University's Energy Centre runs the Energy Economics Summer School. In 2021, 130 participants attended from both industry and tertiary institutions around New Zealand. The event brought together expertise from a range of institutions who spoke about energy transitions, different energy systems (including wind, solar, and hydro), and some of the challenges facing the energy sector.

151

publications based on
UoA queries

67%

National share of
publications based
on UoA queries

157

publications based on
Elsevier mapping

14

courses based on
UoA queries

Key SDG research and education statistics in 2020

“Being in Power Engineering means that I come from the traditions of Tesla and Edison. We want to unleash this innovative spirit here and now so we can create new industries and professions. It’s possible within this field to start your own thing and contribute towards the well-being of humanity and the environment.”

Associate Professor Nirmal Nair, Faculty of Engineering

\$13.5m boost for leading EV charging research

The University is a global leader in Inductive Power Transfer (IPT), a technology that enables high-efficiency power transfer to electric vehicles without the need to physically plug in. As an example, Professor Grant Covic and a team from the Faculty of Engineering have been awarded \$13.5 million by the Ministry of Business, Innovation and Employment to research wireless charging technologies for heavy freight vehicles. The ability to charge freight vehicles using wireless technologies is significant, because it removes two of the largest barriers to freight operators adopting electric vehicles: the time it takes to charge them, and the weight of the battery packs. Professor Covic collaborates with other engineering specialists, including Professor Simon Bickerton who works on the mechanical aspects, and Dr Doug Wilson who addresses paving and transport engineering questions. Their work is also supported by Victoria University of Wellington, the Crown Research Institute GNS Science, and colleagues from the University of Auckland's Business School. Innovative technologies such as this will be vital if New Zealand is to meet the Climate Change Commission's targets for electrification of the country's vehicle fleet.

Sustainability-focused MFAT scholar wins Best Paper award

PhD student Leonie Bule is being funded by the Ministry of Foreign Affairs and Trade to study the use of data analytics to understand energy consumption and efficiency. She was also the recipient of the 'Best Paper' award at the Power Engineering conference organised by the Institute of Electrical and Electronics Engineers, for a paper she co-authored with her supervisor, Associate Professor Nirmal Nair. Leonie has been able to identify the unique power signatures of individual buildings and to highlight in a simple way which buildings might require attention.

Battery electric vehicles and decarbonising New Zealand

Dr Selena Sheng from the University of Auckland Business School completed a comparative study of the Australian and New Zealand vehicle market on greenhouse gas emissions and energy consumption using a Well-to-Wheel analysis, in collaboration with the University of Wollongong. The study took into account vehicle sales, the electricity mix into the future and its long-term impacts on emissions through to 2050. Results suggest that with the current electricity mix of both countries, Battery Electric Vehicles (BEVs) provide the best per kilometre energy and emission performance and require less energy along the entire supply chain in both New Zealand and Australia. In terms of emissions, BEVs emit significantly reduced greenhouse gases per kilometre for the two countries. Furthermore, in the long run, as more 'green hydrogen' is produced from water electrolysis, emissions are predicted to peak around 2030 and then decline in the following decades, providing that BEVs form the major portion of the electric vehicle mix with a higher penetration of renewable electricity.

Professor Grant Covic (centre in grey)



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



Staff encouraged to enter the Velocity Challenge

The Velocity Challenge provides support for ventures and enterprise ideas conceived by both staff and students. Each challenge distributes \$100,000 worth of seed capital, support funding and mentorship to the winning teams, with entries accepted for new ventures, social entrepreneurship (ideas addressing social and environmental challenges), and academic research initiatives.

The insidious return of modern slavery

Associate Professor Christina Stringer of the Business School conducts research into what she says is modern-day slavery among migrant workers in New Zealand. Her work has uncovered a range of exploitative practices in numerous industries, including forced labour, wages far below the legal minimum, threatening behaviour and cruel and degrading work practices. Many victims feel unable to speak out, for fear of having their visas cancelled. Dr Stringer's work has led to positive change, informing policy and operational changes at the Ministry of Business, Innovation and Employment. The Prevent/Protect/Enforce plan seeks to tighten employer accreditation requirements, disqualify the perpetrators of exploitation from hiring migrant workers, and to provide visa protection for victims, so that they can leave an exploitative employment situation without risking deportation.

University of Auckland raises successful entrepreneurs

An analysis of survey results from thousands of University of Auckland graduates dating back to 1940 shows that around 26 percent of graduates go on to found at least one business at some point during their careers, with each business creating an average of eight to nine jobs. Furthermore, the survival rate of businesses founded by University of Auckland graduates is significantly higher than the national average. While nearly 80 percent of New Zealand businesses fail within ten years of their creation, the rate for businesses founded by Auckland alumni is only 20 percent.

University of Auckland named Entrepreneurial University of the Year

The University of Auckland was named Entrepreneurial University of the Year at the Asia Pacific Entrepreneurship and Engagement Excellence Awards in Higher Education, administered by the European-based Accreditation Council of Entrepreneurial and Engaged Universities. This award recognises the University's entrepreneurial impacts, outcomes, strategies and commitments.

University IT services transitions to flexible hot-desking

Connect, the University's IT Service division, found that they adapted well to working flexibly/remotely during the disruptions caused by Covid-19 in 2020. As a way of expanding this, a system based largely on hot-desking has been developed for Connect's staff. This provides enhanced flexibility for staff by allowing them to work on campus when required (by providing facilities for teamwork and engagement), while also supporting them to work remotely wherever possible. A survey indicated that 40 percent of staff spent at least some of their time working at the new facility, with a further 25 percent taking advantage of it for specific meetings and events.

Around 26% of University of Auckland graduates founded at least one business during their careers, with each business creating an average of eight to nine jobs.

University of Auckland Alumni Innovation and Entrepreneurship Survey 2019

53

publications based on UoA queries

16%

national share of publications based on UoA queries

61

publications based on Elsevier mapping

30

courses based on UoA queries

Key SDG research and education statistics in 2020

Well-being webinars

The HR team, in collaboration with internal partners, offered eight Well-being Webinars between May and September, with more than 1,000 enrolments across the events. Topics included managing anxiety, mindfulness, setting and communicating boundaries, personal and team resilience, staying active and safe workstations. Speakers included a range of internal and external experts in both physical and mental health areas. The webinars were also introduced by senior leaders to endorse the message about investing in one's own well-being. Staff who participated reported that they valued the practicality, relevance and robustness of the session content, the expertise and relatability of the speakers, and the opportunity to connect with other staff facing similar challenges particularly during lockdown. The webinars were also supported by free exercise consultations offered to staff by Exercise Sciences postgraduate students and the Sport & Recreation Centre team, as well as the creation of an online Waioira | Well-being community.

ASPIRE Conference

Every year, the University runs the ASPIRE Conference for professional (non-academic) staff. The conference is a way for the University to recognise the contributions of staff working outside of teaching and research, and to showcase their expertise and the contributions that they make to the University's core teaching and research services. The conference also serves as a way for professional staff to meet and network with colleagues from a wide variety of personal and professional backgrounds across the University.

Learning and Teaching Symposium

The University ran a Learning and Teaching Symposium in 2021 to acknowledge the hard work of the University's dedicated teaching staff during this disruptive 2020 and 2021 academic years. This is the only event that is open to all teaching staff across the entire University, and it provides an opportunity for teaching staff to network, interact with senior leadership figures, and to showcase their work. The event was particularly valuable in 2021.



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

Workshops for entrepreneurs

Between July and October, the University's Centre for Innovation and Entrepreneurship ran a series of free workshops for people interested in starting a business. A range of speakers were included, demonstrating a wide variety of entrepreneurial experiences in New Zealand and around the world.

Commercialisation workshops

The University's specialist commercialisation subsidiary, UniServices, ran a series of workshops between March and September for researchers including students who had an idea they want to commercialise. Participants worked through strategies for developing an idea into a sound business plan, as well as methods of pitching the idea. Specialist workshops were also run for ideas in the areas of Space, Diagnostics and Therapies, and Cleantech.

Homegrown hackathon for game development

In August, the University ran "Gamejam", where more than 100 new and veteran game designers came together to test ideas and try their hand at designing a simple game. Support and equipment were provided to participants to enable them to engage with the challenge, and 25 working game prototypes were developed during the event.

As of 2020, the University had been involved with 57 operational companies in business since 2018 or earlier that were set up to commercialise the ideas of staff and students.



Summer Lab recognised for excellence

Summer Lab, a four-week programme run by the Business School for budding entrepreneurs, was recognised by the International Council for Small Business with its top educational prize. The award was based on novelty, creativity, and the ability of the programme to encourage innovation in way with positive potential impact on society. The Summer Lab programme includes workshops, access to entrepreneurs, and instruction on tools to build a successful business. In 2021, more than 100 people participated in the programme.

Hackathon for encouraging bike use

The University of Auckland collaborated with local government agency Auckland Transport (AT) to host a bike-focused hackathon. Teams of tertiary students and young professionals were challenged to come up with innovative ideas to increase the uptake of bikes and improve the experience of current and future bike users. At the end of the event, ideas were judged by a panel of representatives from parliament, an Engineering industry body and AT, with winning concepts slated for follow-up by AT.

Ask an expert and mentor sessions

The University's Centre for Entrepreneurship and Innovation offers a number of services to assist budding entrepreneurs, including mentoring sessions and an 'Ask an Expert' service. These offerings allow innovators to discuss issues of marketing, intellectual property and finance, as well as concept creation. Despite all the disruptions of 2020, these services recorded nearly 100 sessions in that year, and were on track for good attendance in 2021.

Start-up using AI for the wine industry

University of Auckland Alumni Leila Deljkovic, Ali Alomari, Rory Buchanan and Winston Su founded Cropsy, a deep tech start-up whose mission is to deliver scalable technology to every fruit grower to unlock the full potential of their land. The technology is a unique AI-enabled hardware device that allows growers to monitor every plant, understand the whole crop and track how it changes over time by simply attaching the device to their existing tractors. All the data is analysed in real-time and growers view the insights on a software platform. These insights empower growers to optimise every decision they make for the crop. Cropsy makes recommendations and forecasts and provides certainty to growers.



Leila Deljkovic and Ali Alomari

The venture using AI to breathe new life into New Zealand businesses

While completing their PhDs in Bioengineering, University of Auckland alumni Daniel Xu and Ming Cheuk developed an idea for leveraging AI to help businesses increase productivity and reduce costs. With support from the University's Velocity Challenge, this idea eventually became Spark 64, a specialist AI agency that has worked on a range of AI-based projects for a wide variety of businesses in many different industries such as labelling, help-desk automation and the world's first mortgage-lending digital human assistant.



Dr Daniel Xu (far right)

140

publications based on UoA queries

37%

national share of publications based on UoA queries

142

publications based on Elsevier mapping

22

courses based on UoA queries

Key SDG research and education statistics in 2020

10 REDUCED
INEQUALITIES



Reduce inequality within and among countries



Dr Samantha Holdsworth (centre back) with the Matai team.

'Asian' label hides health inequalities among school students

The Youth19 survey of youth psychological and physical health is part of the Youth2000 series, which is jointly led by Associate Professor Terryann Clark from the School of Nursing at the University of Auckland and Associate Professor Terry Fleming from Victoria University of Wellington. Using data from the survey, Associate Professor Roshini Peiris-John has drawn attention to the dangers of viewing Asian respondents as a homogenous group, and notes that there are stark differences in the needs of youth from different parts of the extremely diverse Asian continent. Dr Peiris-John hopes this finding can be used to better meet the needs of these groups. The same survey also uncovered many areas of inequity for youth, including housing deprivation in secondary school students. It shows around 29 percent of students experienced at least one form of housing deprivation in the previous 12 months. The report suggested a broad range of measures, including ensuring that all families have enough money to pay for safe, dry and healthy homes and other basics such as food.

Internal equity function review

Recognising its importance in improving outcomes for targeted equity groups, the University completed a review of its internal equity functions. As a result, a number of changes are being implemented to more solidly ground equity functions in the responsibilities of managers (both academic and professional) at all levels of the organisation. The University has a diverse student body including Māori, a wide range of nationalities, LGBT+ students, and students from refugee backgrounds. By centralising the importance of equity functions at the core of the institution, the University seeks to ensure that it is fulfilling its obligations, both to these students and to the community at large.

University participation in Pink Shirt Day

Staff and student organisations came together to celebrate the anti-bullying Pink Shirt Day in May with a range of entertainment, activities and pink-themed food. This was followed by a workshop for students to learn about how to address bullying, harassment, and discrimination on campus.

Pronouns 101 in hospitals

The Auckland University Medical Students Association has partnered with the Medical Assurance Society to produce name badges with pronouns and a series of educational flyers to explain why the use of and declaration of particular pronouns matters to transgendered and non-binary people. The name badges will be used by students on their hospital placements, while the flyers aim to reduce the load on transgendered and non-binary people themselves to always be the ones explaining the concepts.

Te reo Māori debuts on University of Auckland website

The University launched a new version of its website in 2021 that features te reo Māori headings alongside and in the same font and size as the English names. This initiative is part of the University's ongoing Revitalisation of Te Reo Māori 2020 – 2025 plan, and joins other programmes including Te Kūaha, a te reo/tikanga Māori learning app, bi-lingual signage on campus, and the Kuputaka te reo Māori glossary of University terms and titles.

Supporting Rainbow youth with Werry workforce Whāraurau

The University's commercialisation unit, UniServices, operates Werry Workforce Whāraurau (WWW), which is funded by the government to deliver workforce development initiatives for the child and youth mental health sector. Starting in 2020, WWW has developed a range of resources specifically aimed at helping clinicians to work with members of the Rainbow community. Included in these resources is a module for Takatāpui, which includes qualitative research on the lives of Māori Rainbow youth.

In 2020, the University had 2,886 LGBTI students, 3,073 Indigenous Māori students, 2,025 students with disabilities, and 3,909 students from low socio-economic backgrounds (i.e. school leavers from Decile 1, 2 or 3 secondary schools)

Disability and higher education: better architectural choices

Politics and International Relations postgraduate student Emma Cooper-Williams was invited by the United Nations Academic Impact Group in New York to speak about accessibility measures for people with disabilities. In addition to physical barriers to access, many staff and students with disabilities on campuses around the world also face social stigmas and pressures. The purpose of the interview was to draw attention to the challenges experienced by people with disabilities in higher education, and to focus on how an inclusive architectural design can contribute significantly to their well-being.

U21 award for 360 International Māori learning abroad strategy

In late 2020, the University received an award from Universitas 21 (U21) for having increased the participation of Māori students in study abroad from 3.5 percent in 2015 to 7.2 percent in 2018. Study abroad is highly correlated with academic success, and is therefore viewed as a high-impact academic practice. U21 is an international network of research-intensive universities, with consultative status with the United Nations Economic and Social Affairs Council.

Regional home for cutting-edge research centre

Dr Samantha Holdsworth, a senior lecturer in anatomy and medical imaging, has responded to healthcare inequities she witnessed growing up in Gisborne-Tairāwhiti by founding a medical imaging research charity, Mātai, in that region. Dr Holdsworth was supported in this endeavour by both national and regional development funds, and by the University of Auckland, and hopes to work on a range of brain-related injuries and illnesses that are relevant to the region.

Pacific Academy

The Pacific Academy is a free initiative from the Office of the Pro Vice-Chancellor Pacific at the University of Auckland. The Pacific Academy has partnered with senior staff at schools in South Auckland to deliver a high-quality weekly programme that targets mathematical subjects at Years 11, 12 and 13. The academy is individualised tutoring led by an expert teacher and co-delivered by high-performing upper-level undergraduate/postgraduate tutors from the University. The Pacific Academy aims to improve academic outcomes of students, particularly in maths, while supporting the development of core literacy skills within a Pacific peoples cultural setting and a framework of personal and leadership development. It draws on research conducted by the University and others, to work with schools and students to improve Pacific achievement, particularly those who wish to go on to university study.

196

publications based on
UoA queries

33%

national share of publications
based on UoA queries

150

publications based on
Elsevier mapping

51

courses based on
UoA queries

Key SDG research and education statistics in 2020

11 SUSTAINABLE CITIES AND COMMUNITIES



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

Green star award for University building

The University's adaptive re-use (rebuild) of the Social Sciences building has been awarded 93 points by the New Zealand Green Building Council, the highest score awarded since the inception of the rating. The new building, due to open in 2024, will send less waste to landfill, create less pollution through both construction and operation, and provide healthy, comfortable spaces for students and staff. The building will also be equipped with a rainwater harvesting system and will produce a portion of its energy needs on-site.

A multidisciplinary look at sustainable infrastructure

The University has founded an Infrastructure Research Initiative, including nearly 100 researchers, and a steering committee with representatives from each faculty. The group aims to tackle significant issues of infrastructure as they intersect with sustainability, from a multidisciplinary point of view. The intention is that the group will be driven by a combination of researchers' unique specialisations and interests, as well as by a desire to respond effectively to government and industry needs.

Models of sustainability

Professor Brent Young of the Chemical and Materials Engineering department is working with a number of companies to develop sophisticated 'digital twins' of their processes. In effect, these are complex computer models that allow a business to test their processes against a variety of predictable and unpredictable events in order to gauge how efficient, durable, and sustainable they are. Work is ongoing to allow the modelling of sustainable new processes that don't yet exist on an industrial scale.

“Engineering is an applied science. I learn as much from people in industry as they learn from me ... I like to think my work helps them serve the public. Also, how do we clean up the mess we’re making of the planet? How do we do better in the future? These are the questions that increasingly motivate me.”

Professor Brent Young, Faculty of Engineering

University of Auckland wins regional bike challenge

More than 300 staff from the University participated in the annual Aotearoa Bike Challenge, and placed first in the Auckland region for organisations with 2,000+ staff. Participants cycled nearly 60,000 kilometres and saved about 3.6 tonnes of carbon dioxide from entering the atmosphere. The challenge encourages participants to spend at least ten minutes cycling, and to encourage others to do the same.

Student composting champions lead the way

A team of students at the Carlaw Park student village successfully trialled a composting programme between August and October 2020. During the trial, they diverted several hundred kilograms of food waste from landfills. With full implementation, they estimate that this could rise to at least several tonnes at Carlaw alone.

242

publications based on
UoA queries

28%

National share of publications
based on UoA queries

204

publications based on
Elsevier mapping

92

courses based on
UoA queries

Key SDG research and education statistics in 2020

Game design for sustainability education

A project has been developed that asks students of the University’s three-course sustainability module to develop an educational game. Professor Niki Harré, the co-ordinator of the module, hopes that this initiative will help students to market the ideas of sustainability to the wider public.

University modelling predicts future earthquake danger zones

University of Auckland researchers Associate Professor Liam Wotherspoon, Dr David Dempsey and Dr Jennifer Eccles used a physics-based simulator to better understand the potential impact of earthquakes in the upper North Island. Their findings indicate that the relatively high population density and complex infrastructure in this area make it uniquely vulnerable to earthquakes from points as far apart as Matamata to the Hūnua Ranges. This research was conducted as part of the government-funded Te Hiranga Rū QuakeCoRE (Centre of Research Excellence).

University of Auckland and Ho Chi Minh City partner in teaching of smart city strategies

The Faculty of Creative Arts and Industries has partnered with the Institute of Smart City and Management (ISCM) at the University of Economics Ho Chi Minh City to make Part II of the Bachelor of Architectural Studies at the University of Auckland available to ISCM students, after completion of their first three semesters in Vietnam. Not only will this provide Vietnamese students with the opportunity to explore sustainable architecture and smart city development from a New Zealand perspective, but it will also pave the way for future collaborations in research and teaching in this area.

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Ensure sustainable consumption and production patterns



Plastic Free July 2021

Staff from the University were involved in Plastic Free July for the fourth year running. Staff were encouraged to buy reusable containers (with discounts and incentives), and prizes were drawn for staff who submitted a waste reduction change they had made in their own life of which they were proud.

From waste to win

Associate Professor Saeid Baroutian of the Chemical and Materials Engineering department leads the Sustainable Resource Recovery masters programme, where he and his students work on innovative ways for reuse, and to find new ways of utilising things seen as having no value. For example, in collaboration with his PhD student Terrell Thompson, a new method of converting sargassum seaweed to biogas and biofertiliser was developed. This is invaluable to Terrell's home country of Barbados, where sargassum accumulation on beaches is becoming so severe it is driving away tourists, creating discomfort for residents, and causing ecological damage. The developed sargassum-based biorefinery technology could offer many socio-economic and environmental advantages to Caribbean countries.



Promoting a reuse culture one scoop at a time

The Sustainable Future Collective hosted its annual Bring Your Own Bowl, Free Ice Cream event on the City and Grafton Campuses. Several hundred participants received a serving of dairy-free ice cream in a reusable container they brought from home. Julia Vajda De Albuquerque, spokesperson for the Collective, said the event was designed to be a fun way of getting people to think about how they can make small changes to their daily lives to reduce the amount of waste they produce. The Collective is a student-led organisation with a membership comprising staff and students from across the University.

International competition identifies idea for bio-waste solution

In collaboration with the University of Canterbury and Lincoln University, the University of Auckland participated in an online competition for Indian students called "What's your billion-dollar idea?", with the winners receiving virtual internships at one of the three participating institutions. The ultimate winner, Joel Joseph, a student of mechanical engineering and marketing, was also provided mentoring by Wendy Kerr, the former director of the University's Centre for Innovation and Entrepreneurship. Wendy helped Joel develop his idea to convert unhygienic fish waste from the markets in his home city into bio-fertilisers and animal feed.

ABI swaps fashion for sustainability

In December 2020, staff at the Auckland Bioengineering Institute organised a clothes-swap, where staff could get tokens for donating items of clothing that could then be redeemed for items that other staff had dropped off. Staff who had nothing to donate could instead buy tokens for \$2 each, with the proceeds donated to Sustainable Coastlines.

Improving the reusability of plastic

Associate Professor Johan Verbeek is head of the University's Plastics Centre of Excellence. He and his colleagues from a range of disciplines work on ambitious projects to improve the reusability and recyclability of plastics in a wide range of contexts, as well as coming up with ways to produce new materials from waste products. Ultimately, what Dr Verbeek wants to achieve is the right market conditions to help industry get New Zealand to the same level as Europe when it comes to recycling.

Muscling in on the seafood industry

University of Auckland PhD students Will McKay and Brad Skelton have developed a method of fostering 'super babies' of the economically important green-lipped mussel. Currently, most mussels farmed in aquaculture settings come from juveniles harvested directly from a single beach in northern New Zealand. However, the early stages of farming are often extremely inefficient with losses of up to 95 percent within the first few weeks of farming being commonplace. The technology developed by McKay and Skelton allows mussels to be rapidly grown to larger sizes where this is less likely to happen. Not only will this have economic benefits by protecting mussel farmers from uncertainty associated with relying on a highly variable and unpredictable source of seed mussels, but will also mean that the same number of farmed mussels can be obtained with far fewer juveniles taken from the wild.

Zenno Astronautics pioneers the future of sustainable space exploration

University of Auckland Engineering alumnus Max Arshavsky has founded a start-up, Zenno Astronautics, to market his fuel-less satellite propulsion technology based on electromagnets and solar power. Arshavsky's device would allow smaller, lighter satellites to be built, which would make it much easier to send them into space, and allow them to continue operating and reorienting themselves almost indefinitely. He is supported in this endeavour by his COO, Reuben Brown, most recently a Strategic Projects Manager at the University.

"Given New Zealanders are among the highest per capita plastic waste generators in the world, we have a lot of catching up to aspire to a recycling industry that reflects what is growing in Europe."

Associate Professor Johan Verbeek, Faculty of Engineering

121

publications based on UoA queries

22%

national share of publications based on UoA queries

62

publications based on Elsevier mapping

20

courses based on UoA queries

Key SDG research and education statistics in 2020

13 CLIMATE ACTION



Take urgent action to combat climate change and its impacts

Ecological and climate-based action in volunteer week

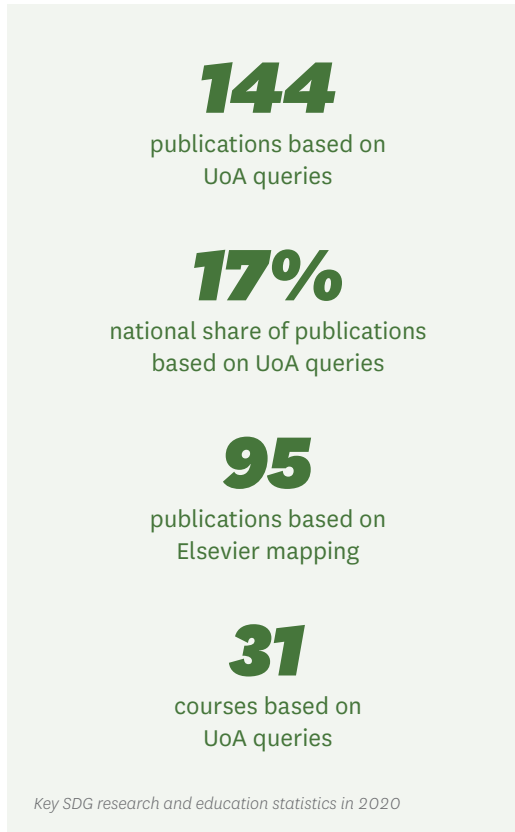
In 2021, the theme of the national annual Volunteer Impact Week was 'Hours for People and Planet' (Ko ngā hāora mō ngā me te Aorangi), with staff, students and alumni of the University of Auckland contributed to a number of ecological and climate-based actions. For example, staff from Organisational Performance and Improvement helped plant trees along the Wairau Estuary in Auckland's North Shore for Conservation Volunteers New Zealand, while staff in the Risk Office helped Birdcare Aotearoa restore native bird habitats and remove invasive weeds in the West Auckland suburb, Green Bay.

Climate change driving global movement of marine species

PhD student Chhaya Chaudhary was the lead author on a study that confirmed a key prediction of the ecological impact of climate change, namely that marine species would increasingly move poleward away from the equator as temperatures rose. The findings held true across tens of thousands of species of fish, molluscs and crustaceans, as well as for species living near the seabed and in open water. The study was based on data collected as part of a ten-year study by Professor Mark Costello, also of the University of Auckland.

Climate Science Initiative rises to climate change challenge

Using the Vice-Chancellor's Strategic Development Fund, the University underwrites the cross-disciplinary Climate Science Initiative, headed by Professor David Noone. The Initiative bolsters the University's broad expertise in the field by supporting a focal point for excellence, and enabling a wide range of climate-related issues to be examined from many different academic perspectives. These span essential aspects of climate and ecosystem science that underpin climate change, connected issues of resources and infrastructure, and the social and psychological impacts on communities who are affected by climate change.



Professor David Noone

Estate Strategy – Te Rautaki Tūāpapa

The University is finalising its 2021 – 2030 Estate Strategy. An important aspect of this strategy is improving the sustainability profile of existing structures in terms of water conservation, energy efficiency and overall carbon footprint, as well as obtaining good external ratings for new structures in these same areas. The policy calls for the University to achieve a net-zero carbon estate by 2030, and to embed the Sustainable Development Goals at the heart of all estate-related activities by ensuring activities are environmentally, economically and socially sustainable.

Changes to University steam supply

Previously, the University's Faculty of Medical and Health Sciences procured its steam supply from the nearby public hospital, where it was generated using gas-fired boilers. This has recently been transitioned to an electrically powered internal system. Not only does this improve energy efficiency in that there are significantly reduced distribution losses due to the shorter distance the steam must travel, it is also expected to result in greater carbon efficiency because the University's electricity suppliers do not generate power using fossil fuels.

“There are voices across the Pacific, New Zealand being central to that, that speak loudly together. And we represent a group where climate is very strongly influencing ways of life, and where the survival of communities in the future is really threatened.”

David Noone, Buckley-Glavish Professor of Climate Physics



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



Scholarship for research on tohorā

University marine sciences student Annabelle Cranswick was awarded a New Zealand Post Antarctic Scholarship to assist in her masters degree, investigating the diet and foraging ecology of the tohorā or southern right whale. The aim of her research is to not only understand where, when and upon what the tohorā have been feeding, but also to investigate the migration routes between feeding and breeding grounds. Current thinking among marine scientists is that the ‘cultural’ knowledge of such routes that whales traditionally pass on to their offspring may have been disrupted or lost during the era that tohorā were hunted.

Lockdown: when the ocean went quiet

Associate Professor Craig Radford collaborated with Dr Matthew Pine from the University of Victoria, Canada, to take advantage of the first Covid-19 lockdown to conduct an acoustic study of the underwater environment in the Hauraki Gulf. Many marine species rely on sound to communicate in a variety of contexts, including such critical behaviours as mate selection and predator evasion, and marine scientists have known for some time that human-generated noise is a significant and growing disruption to these behaviours. Dr Radford found that, without the noise of small vessels, bottlenose dolphins were able to communicate over significantly greater range than usual, in some cases up to a kilometre further apart. He and his colleagues note that most research of this nature has focused on large vessels, but hope that their study will demonstrate that large numbers of smaller recreational boats can also have an impact on the marine environment.

161

publications based on UoA queries

21%

national share of publications based on UoA queries

98

publications based on Elsevier mapping

24

courses based on UoA queries

Key SDG research and education statistics in 2020

Why animal culture matters for conservation

An international group of researchers, including Dr Emma Carroll of the School of Biological Sciences who is part of the IUCN Convention on Migratory Species, has published a paper in the journal *Proceedings of the Royal Society B* giving conservationists a roadmap to help them protect endangered species by taking into account animal social learning and culture. Dr Carroll explains that many animals, from meerkats to whales, have 'culture' in the sense that they learn behaviours from each other, and pass those behaviours on to the next generation. This can lead to differences between groups that might not be readily apparent from a strictly genetic and ecological analysis. For example, socially learned predator avoidance behaviours can increase survival in reintroduced populations of endangered animals from fish to primates. Another is that migration routes for arctic whales can be important to help them avoid being trapped by sea ice.

Ocean acidification causes hearing loss in fish

A collaborative study between the University of Auckland, James Cook University and the National Institute of Water and Atmospheric Research (NIWA) has demonstrated how ocean acidification caused by rising CO₂ levels impacts on the sensory abilities of fish. For their study, the researchers used broodstock snapper, and found that high CO₂ levels resulted in deformations of the otoliths, small bone-like structures similar to the middle ear, that allow the fish to sense vibrations. In turn, these deformations meant that the affected fish had a significantly reduced ability to detect low-frequency sound, which is ordinarily an important method they use to navigate, as well being vital for other behaviours.

“In this way of thought, and this way of being, all the world is a vast kin network powered by the winds of life and growth – one living system, one source of life. And in this relational cosmos, mind and matter are not split, nor are knowledge and desire.”

Professor Dame Anne Salmond, Faculty of Arts



New and ancient lens for healthy rivers

University of Auckland staff Dr Daniel Hikuroa (Māori Studies), Professor Gary Brierley (Environmental Science), Associate Professor Siouxsie Wiles (Medical and Health Sciences), Dr Billie Lythberg (Business and Economics) and Professor Dame Anne Salmond (Anthropology) have come together with colleagues, communities and experts in mātauranga Māori (Māori knowledge) to give evidence-based effect to legislation in New Zealand that grants legal personhood to rivers, both as a way to protect them from degradation, and to challenge people to think differently about them. Their approach, which spans a wide range of disciplines, is rooted in mātauranga Māori where waterways are seen as complex living systems in which the ora (life or well-being) of land, water, plants, animals and people is fundamentally interconnected.

Marine scientists' solution to unlock curious minds

In collaboration with the Business School's Centre for Innovation and Entrepreneurship, the University's Marine Discovery Centre in Leigh has launched a project teaching schools and members of the public how to make a hydrophone (a microphone that works underwater). Ultimately, the plan is for users to be able to post their recordings, along with a map pin to the project's website, creating a publicly accessible database of marine sounds. Dr Tim Haggitt, manager of the Centre, hopes the initiative will help members of the public to feel engaged with marine science and to better appreciate the marine world and its inhabitants. The project was initially enabled by an 'Unlocking Curious Minds' grant from the Ministry of Business, Innovation and Employment.

Plastic leachate at the base of food web

Aotearoa Impacts and Mitigation of Microplastics (AIM²) is a multi-disciplinary ESR-led national research programme assessing the impacts of microplastics in New Zealand. Dr Louis Tremblay of the School of Biological Sciences is conducting research into the impact of microplastics on New Zealand native organisms. Dr Tremblay and his team are interested in the risks of chemical additives incorporated into plastics to give specific attributes (for example, UV blockers, heat stabilisers, or dyes and pigments). These chemicals are not bound and can slowly leach out of the material, potentially affecting the health of creatures exposed. They are using a native crustacean species as a model to study the toxicity of these chemicals. The short lifespan and rapid generation of this species make them ideal to investigate the potential of these chemicals to cause harm. The objective is to identify the most toxic chemical additives so that they can be better managed or even replaced in plastic products.



Dr Louis Tremblay



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



Auckland's bright lights harming ecosystems

Recent PhD graduate Dr Ellery McNaughton (Biological Sciences) investigated the ecological impact of Artificial Light at Night (ALAN) at various sites around Auckland. Globally, this is a well-documented problem, with human-generated night-time light responsible for changes in the behaviour of a range of animals, including small mammals, birds and insects. Dr McNaughton's research found that in some years, over 95 percent of the areas being monitored had predicted light brighter than natural levels, with some areas in commercial or industrial zones up to ten times brighter. Furthermore, the relationship between the Moon and night sky brightness was also affected, representing a risk for animal species that rely on lunar brightness for reproductive or navigational purposes. Dr McNaughton notes that light pollution is a relatively easy problem to fix, with options including switching off lights if they are not needed, dimming them during quiet hours, or shielding them so they point downwards rather than reflecting back up into the sky.



Dr Ellery McNaughton

Moth Week

For the first time, the University of Auckland participated in Moth Week – an annual celebration of moths. The University's involvement was organised by Science PhD student Morgane Merien, who contends that moths are both ecologically important and also understudied. A significant part of Moth Week is organising events around the country where volunteers can trap, document, and release moths so that scientists can gain a better understanding of which species are prevalent where. This is especially important in New Zealand, where more than 90 percent of moth species are not found anywhere else in the world, and only about 75 percent of them have been scientifically documented.

"I feel very lucky to be able to research something that is important to many Kiwis ... Kauri is a keystone species that influences the species composition around it in forests so if we lose kauri, the whole forest dynamic is likely to change."

Shannon Hunter (University of Auckland PhD student)

University bee sanctuary

The Sustainable Future Collective has developed a piece of land near the Auckland Law School into a bee sanctuary. This area is used both as a staging ground for general sustainability education for students (e.g., composting and growing produce), as well as a way to teach students about the importance of bees to the ecosystem. The Collective hosts frequent events where volunteers are invited to help plant native trees and flowering plants for the bees' benefit.

Kauri fightback

Associate professors Luitgard Schwendenmann (School of Environment) and Bruce Burns (Biological Sciences) are addressing the problem of kauri dieback, a fatal disease affecting New Zealand's native kauri trees. Pre-colonisation, kauri were common in northern New Zealand but less than one percent of the original forests remain, and many of these remaining areas are now affected by the disease. Whereas kauri normally live for hundreds of years and reach incredible sizes, the disease organism gradually strips away their canopies, eventually killing the tree. PhD students Toby Elliot, Shannon Hunter and Tracey Godfery and masters student Siqi Yang are all tackling the issue from several angles. These include modelling of kauri population growth with and without the disease, impacts on kauri ecosystem composition and function, understanding the basic biology of the pathogen, investigating the large-scale use of chemical treatments to protect and heal the trees, and developing a risk assessment framework.

Exploring why seabirds become bycatch

About a quarter of all seabird species are found in New Zealand, which is an important global hotspot for the birds. PhD student Ariel-Micaiah Heswall along with Dr Anne Gaskett and Dr Megan Friesen, want to understand what makes certain seabirds more vulnerable to becoming bycatch in fisheries, a well-documented problem where birds get tangled in fishing lines and nets and die. What they've found is, while in part it was a question of size (i.e., larger birds become entangled more easily), the sensory capacities of the bird also played a role. Species with relatively larger sensory systems and sensitivities were drawn to fishing boats as a kind of 'sensory trap' driven by the lights and smells. Heswall notes that this provides avenues for future research into mitigation.

Invasive wasps share resources on offshore island

Professor Jacqueline Beggs and PhD graduate Dr Julia Schmack investigated invasive wasp species on Ahuahu Great Mercury Island. The island is notable as home to four such species, which allowed the researchers to examine not only their impact on native flora and fauna, but also to understand how they interacted with one another. Their finding that the wasps shared resources rather than competed for them was concerning, in that it suggests the four populations are relatively stable, and unlikely to out-compete one another. They hope that their study will provide insights into the community assembly of multiple invasive species interacting in a single ecosystem.

Scientists offer free soil tests to New Zealanders

In collaboration with GNS Science (a Crown Research Institute), the University of Auckland has launched Soilsafe Aotearoa, a major new research initiative that invites New Zealanders to send soil samples from their homes for a free heavy-metal analysis. The project also includes an education programme and surveys participants about their attitudes concerning soil health, and what (if anything) they are growing in their backyards. A number of postgraduate students are also involved with Dr Melanie Kah and Dr Emma Sharp of the School of Environment. The work is at an intersection of environmental and human sciences, examining both the soil itself and the people who interact with it.



Dr Emma Sharp (left)
and Dr Melanie Kah

Achieving New Zealand's pest-free goals

A team from the University of Auckland has adapted a statistical tool more commonly used in medicine (a time-to-event analysis) to calculate the chances of reaching pest (particularly rat) eradication targets for various islands around New Zealand. Their model considered the size of the island, its distance to the mainland, whether it was owned publicly or privately, whether it was inhabited, and whether rats had already been successfully eradicated. Their results indicated that only 14 out of 74 islands assessed were likely to be rat-free by the 2050 target. PhD student Zachary Carter says new social and scientific initiatives need to be added to the toolbox, such as genetic technologies that could produce a Trojan female to produce infertile male offspring, or rat-specific toxins.

181

publications based on
UoA queries

16%

national share of publications
based on UoA queries

87

publications based on
Elsevier mapping

29

courses based on
UoA queries

Key SDG research and education statistics in 2020



Dr Julia Schmack



Mr Zachary Carter

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

Investigating new ways to prevent phishing

Associate Professor Giovanni Russello, Dr Danielle Lottridge and Associate Professor Yun Sing Koh of the School of Computer Science are looking at a new human-centred approach to prevent phishing. They argue that current technological approaches (such as filtering) still allow many malicious emails to slip through, while education-based initiatives such as training and alert messages are frequently ineffective. For example, providing users with training fails to consider human factors such as how rushed or stressed a person is while flicking through their emails. Even the most well-trained could accidentally click a malicious link while in such a state. Moreover, important alerts are often excessive, warning users about routine activities to such an extent that users ignore them. What the team hopes to do is gather physiological data from users (such as eye motion and heart rate) during phishing simulations, and then use AI for personalised interventions, only in specific high-risk situations. In the long run, the team is working on establishing a foundation for Digital Well-being, which would devise tools to help and support users in today's digital workplaces.

Business summer scholars

The University awards Summer Research Scholarships to hundreds of undergraduate students every year, granting them a tax-free stipend to conduct a supervised research project over ten weeks in summer. For example, Cameron Baker from the Business School looked at misinformation, hate speech, and 'digital mischief' on social media, with a particular focus on the 2020 US elections, Covid-19, and the Christchurch mosque attacks. The work allowed Cameron to merge his own experience in marketing and social media with the legal expertise of his supervisors, Associate Professor Gehan Gunasekara and Dr Alan Toy.

Professor Warren Swain elected to the Royal Historical Society

Professor Warren Swain (Faculty of Law) was elected a Fellow of the United Kingdom Royal Historical Society. This was a recognition of his significant contribution to historical scholarship in the field of law and legal studies, spanning numerous publications on the history of law in jurisdictions around the world, including England, New Zealand, Australia and India. Of particular note is his comprehensive study *The Law of Contract 1670 – 1870*, published by Cambridge University Press in 2015. The Royal Historical Society is a champion of history and historical studies within academic contexts as well as wider society.

Christmas appeal 2020

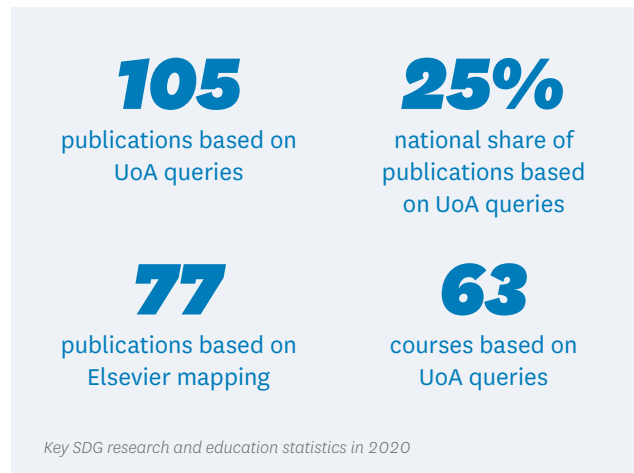
The University of Auckland welcomes many students from challenging refugee backgrounds, and ran 'Christmas Appeal 2020' to encourage staff to support scholarships for these, as well as supporting the Centre for Asia Pacific Refugee Studies Tāwharau Whakaumu. The Centre is a multidisciplinary specialist academic unit that aims to respond to contemporary challenges of both conflict and climate-induced displacement. During the Christmas Appeal, hundreds of donations were received, totalling more than \$40,000 for these two causes. Staff and alumni have continued to donate to refugee scholarships through 2021, adding nearly \$14,000 as of August 2021.

Pacific experiences of the criminal justice system

Litia Tuiburelevu, a research fellow in the Faculty of Law, was awarded a substantial grant from the Michael and Suzanne Borrin Foundation to capture the experiences of Pacific peoples in the New Zealand Criminal Justice System (CJS). Litia is particularly interested in understanding why Pacific peoples are overrepresented in the CJS, and what individual, structural, and cultural determinants contribute to this phenomenon. Her work builds on earlier scholarship by prominent lawyer Moana Jackson, author of *He Whaipaanga Hou*, a report on the experiences of Māori with the CJS.

GovHack opens up data

Staff, students and members of the public came together online in 2020 for the annual GovHack event, which seeks to promote open data. A range of valuable projects came out of the event, including an online map showing gaps in accessibility-related datasets, an app for neuro-diverse children to help them find suitable games and educational material, and a tool to help people unaccustomed to working with large amounts of money to better understand KiwiSaver, New Zealand's major national savings scheme.



Using the law as a tool for freedom

Auckland Law School graduate Peter Williams works with the International Justice Mission (IJM) to help release people from bonded labour. He describes the practice as paying the workers so little that they're forced to take on more loans from the person to whom they are bonded, essentially trapping them in a cycle of servitude. Escapees are generally caught, and often publicly beaten. His work in Asia is often hampered by corruption, and the difficulties associated in gaining access to the workers for forensic interviews, but he describes it as fulfilling to be able to free vulnerable people and return them to their families.

Heading to the high court

Susan Thomas and Neil Campbell, two alumni of the University of Auckland Law School were recently appointed as Chief Justice and Justice of the High Court, respectively. Justice Thomas completed a BA and LLB (Hons) at the University, and has worked in a variety of legal positions in private practice in both New Zealand and the United Kingdom, as well as in the judicial system in New Zealand since 2005. Justice Campbell completed a BCom and LLB (Hons) at the University, before pursuing an LLM degree in the UK at the University of Nottingham. He has worked as both a lecturer at the University and in private practice, and was appointed a Queen's Counsel in 2013.

UN academic impact group calls for global ceasefire

The University of Auckland joined with other members of the United Nations Academic Impact Group to support Secretary-General António Guterres' urgent appeal for a global ceasefire. The group drew attention to the challenges posed by ongoing conflict in terms of mitigating the human impact of Covid-19.

University commits to improving cultural competency

As part of the University's 2021 – 2030 strategic plan *Taumata Teitei*, the University has committed to improving the knowledge that staff have regarding the tikanga (customs and culture) and reo (language) of New Zealand's Indigenous Māori people. The University recognises that institutions of higher learning have an important role to play in the preservation and advancement of Indigenous cultures, and hopes with this initiative to lead by example. Uptake of te reo and tikanga Māori courses among staff will be measured as a key performance indicator, and published in the annual reports.

17 PARTNERSHIPS FOR THE GOALS



Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development



From left: Medical students Daham Nanayakkara, Rebecca Veitch, Mackenzie Groos, Aakash Rajay, Connie Alarcon and Theresa McLean.
Photo: Lakes DHB

Te Taumata Rangahau – celebrating research excellence 2021

In September 2021, the University hosted a series of discussions with the theme 'Aotearoa Future Shapers – Post Pandemic Transformation'. The topics covered a range of areas relevant to the Sustainable Development Goals, including water consumption and quality, social inequities exposed or exacerbated by the pandemic, and the potential long-term impact of 'long Covid' and lockdown mental health struggles in New Zealand.

Sir Peter Gluckman's speech to the United Nations

Distinguished Professor Sir Peter Gluckman, director of Koi Tū: The Centre for Informed Futures and president-elect of the International Science Council, delivered a speech on sustainability to the Science Summit of the UN 76th General Assembly. Sir Peter drew attention to the highly productive partnership of academic, private, and public interests in combating Covid-19, while also discussing the challenges posed by the politicisation of science, misinformation and the psychological impacts of prolonged lockdowns. Sir Peter's message to the Assembly was that science should be at the forefront of international decision-making, that research agencies should seek opportunities to collaborate to a greater extent, and that a wide-scale, global approach to global problems is called for, taking into account the needs of both large and small economies.

"[T]here also are many issues in which both transnational and transdisciplinary action is needed. The challenge is how to do this effectively and rapidly without unnecessary duplication ... and doing it in a truly inclusive manner reflecting the needs of the global commons."

Sir Peter Gluckman,

Remarks to the opening plenary of Science Summit to the United Nations 76th General Assembly

University of Auckland students and alumni at the Olympics

University of Auckland students supported by the University's High Performance Support Programme took part in the Olympics while undertaking study. The programme works with students competing or performing at a high level. Theresa Fitzpatrick is a Bachelor of Health Science student and in the women's sevens team who won a gold medal in Tokyo, while Michael Brake (Engineering honours student) was in the gold-medal winning men's eight rowing crew. Alumnus Dylan Schmidt (BCom 2020) won bronze in trampolining and had also been supported by the programme at his previous Olympics. In addition, Kanah Andrews-Nahu, a student of the Faculty of Medical and Health Sciences, represented New Zealand in weightlifting, while track athlete and student Anna Steven (Faculty of Science) took part in the Paralympics. The High Performance Support Programme provides students with flexible study assistance and well-being support in accordance with the University's membership of the Athlete Friendly Tertiary Network.

New government alliance to address climate change

UniServices, the University's commercialisation subsidiary, is part of a collaboration with Callaghan Innovation (a Crown Research Institute) and several other public and private agencies that seeks to maximise the economic opportunity of 'CleanTech'. The goals of the partnership are heavily focused on commercialising beneficial technologies for maximum economic and environmental impact, a key specialisation of UniServices.

Associate Professor Siouxsie Wiles recognised for science communication

For her work in communicating Covid-19 related science to the general public, Associate Professor Siouxsie Wiles was recognised with a Critic and Conscience award from the Gama Foundation. Dr Wiles is a strong advocate for science communication, and argues that research doesn't end with publication of the findings in an academic context.

University community voices and New Zealand's natural capital

The Auckland Business School's Centre for Innovation and Entrepreneurship organised a 'Future Voices Forum', where students and staff from a range of disciplines came together to discuss ways of better managing New Zealand's natural capital. They brainstormed ideas relating to food, energy and transport, with the results relayed to the heads of a number of large public and private entities including ASB Bank, Mercury Energy, Sanford Fisheries and the national Treasury.

Immunisation Advisory Centre supporting Covid-19 vaccination programme

The Immunisation Advisory Centre (IMAC), a business unit of the University's commercialisation subsidiary UniServices, is deeply involved in the Covid-19 vaccine rollout, both in New Zealand and in the Pacific islands. The IMAC, led by medical director Professor Nikki Turner, is the only provider contracted to provide large-scale training of the vaccinator workforce, a task of unprecedented size and scale. In addition to this, the IMAC has also developed training for advanced-level medical students and healthcare professionals who would not normally administer vaccines, as well providing educational material for professionals and members of the public via its website. University of Auckland medical students have been trained as vaccinators and have played a part in the rollout not just in Auckland, but in other regions such as Rotorua.

University co-hosts EduSummit 2021

In conjunction with Quacquerelli Symonds (QS), the University of Auckland hosted the online EduData Summit in June 2021, a global forum for data-driven educators. A particular focus was on measuring the impact of evidence-based educational policies, and on improving outcomes for under-represented groups. University of Auckland Vice-Chancellor Professor Dawn Freshwater drew particular attention to UN research indicating there are hundreds of millions of students around the world without access to online and remote learning.

Prime Minister recognises transformative science

Te Pūnaha Matatini (TPM), a government-funded Centre of Research Excellence featuring scientists from all over New Zealand but hosted by the University of Auckland, was the recipient of the Prime Minister's Science Prize in 2020 for its work on modelling and analysis of data related to the Covid-19 pandemic in New Zealand. The New Zealand government came to rely heavily on forecasts and models produced by TPM to inform decisions around what restrictions were needed, and for how long. New Zealand has achieved a low rate of mortality from Covid-19, compared to almost all other developed countries.

University Co-Hosts International Innovation Summit

The University of Auckland partnered with Pennsylvania State University to host the 2021 Times Higher Education Innovation and Impact Summit. The focus for the summit was on the value of international research and collaboration, with a theme of 'cultivating resilience, changing the world'. Participants from more than 130 countries took part to discuss how innovation can create resilience, and how crisis can create opportunity.

University joins global network driving accelerated health breakthroughs

The University was one of the 21 charter participants of the Wellcome Leap Health Breakthrough Network. The Network links academic and research institutions, with the goal of rapidly responding to serious global health challenges such as cancer and infectious diseases. These 21 institutions represent more than 150,000 researchers across six continents. A key achievement of the Network is the Master Academic Research Funding Agreement (MARFA). This means that participating institutions need only negotiate the statement of work, with other issues such as ownership, intellectual property, and publication being handled in a standardised way through the MARFA. In turn, this significantly reduces the time required to organise funding and start work.

Data partnership with the insurance sector

The University has partnered with insurance provider Tower to leverage the vast array of data that Tower has collected over its many years in the industry. From this arrangement, the University gains real-world material for researchers and data science students, while Tower obtains access to expertise that will help them improve customer service, streamline processes, and more equitably price insurance products. The nature of insurance as a product means that insurance-related data touches on nearly every aspect of society, from healthcare to property ownership, with associated demographic information on almost any group imaginable. As a result, the data to which the University gains access will support a range of economic, social, and health-related research.

Faculty of Arts school outreach programme

In October 2020, the Faculty of Arts hosted 'Impact Day 2020: Co-creating a Fairer Aotearoa' for Year 11 - 13 high-school students. Seminars were provided by academics from the departments of History, Sociology and Politics, and breakout sessions were run by the Sustainable Future Collective and spoken word performers. In all, 80 students from 28 schools across Auckland took part.

University helps out with Covid-19 testing

Grafton Clinical Genomics, a venture of the Faculty of Medical and Health Sciences, was involved in early testing of Covid-19 samples, testing 8-9 percent of all samples in the country over the first seven months of the pandemic, reducing the pressure on the Auckland District Health Board's laboratory personnel. Numerous staff and students stepped in to help, to keep the facility running almost non-stop, including at least two individuals who suspended their studies to assist.



About this Report

This report summarises a range of activities that the University of Auckland undertakes to meet the Sustainable Development Goals (SDGs).

Most of these activities can be understood to fall under research, teaching, operations, engagement and partnerships. We have substantiated the report with quantitative research and teaching-related SDG metrics, as well as a range of qualitative case studies.

As with last year, 2021 created both complex challenges and opportunities to overcome these challenges collectively. The University of Auckland has continued to work towards reducing inequalities, poverty and hunger among our staff, students and the wider community, as well as contributing to solutions for a wide range of social, economic, environmental, and health-related challenges.

This year's report is a list of ongoing activities and initiatives, capturing both our ongoing commitment to combating the global pandemic as well as a range of other activities that we have adapted to suit the current circumstances. We remain committed to the Sustainable Development Goals and believe that the underlying principles of the SDGs will help the University and the society recover better post-pandemic.

SDG metrics

Publications and related research metrics are reported for each SDG based on a hybrid approach. In addition to reporting research publications captured by Elsevier's 2021 SDG mapping, the University of Auckland is also committed to reporting SDG research publications using the 'Auckland Approach', which represents the effort of the University to localise SDG mapping to account for the context within which our research activities take place. What our method adds is the ability to capture relevant but very locally specific terms. These may include, for example, specific geographical

locations, or locally used terms for general academic concepts. This method builds on the SDG mapping partnership with Elsevier, Aurora, and the University of Southern Denmark in which best practices for SDG mapping are shared. This SDG localisation effort has extended our understanding of the SDG research activities that are unique to the University of Auckland, our Māori and Pacific communities, Aotearoa New Zealand, and the Pacific region.

In 2021, the University of Auckland has made a further attempt to generalise the Auckland SDG research mapping approach to understand our learning and teaching activities. Courses taught in 2020 are mapped onto the SDGs based on metadata contained in the course catalogue. This course mapping effort identified 792 SDG-related courses out of 2,441 courses in total offered by the University of Auckland in 2020.

More information about the University of Auckland SDG Mapping project is available at: www.sdgmapping.auckland.ac.nz

Case studies

Striving to pick a diverse range of initiatives from across the University, we shortlisted a range of case studies based on comprehensive consultation with key stakeholders undertaking these activities. These case studies cover examples of research, teaching, operations, engagement and partnerships, and were chosen because they highlight clear contributions to the respective SDGs involved.

This SDG report lists only a few of the many initiatives undertaken by the University of Auckland. Our [sustainability news and opinion](#) pages are regularly updated with the latest information about University of Auckland initiatives and activities towards the SDGs and our [Mātātaki | The Challenge](#) explores some of these initiatives in-depth.

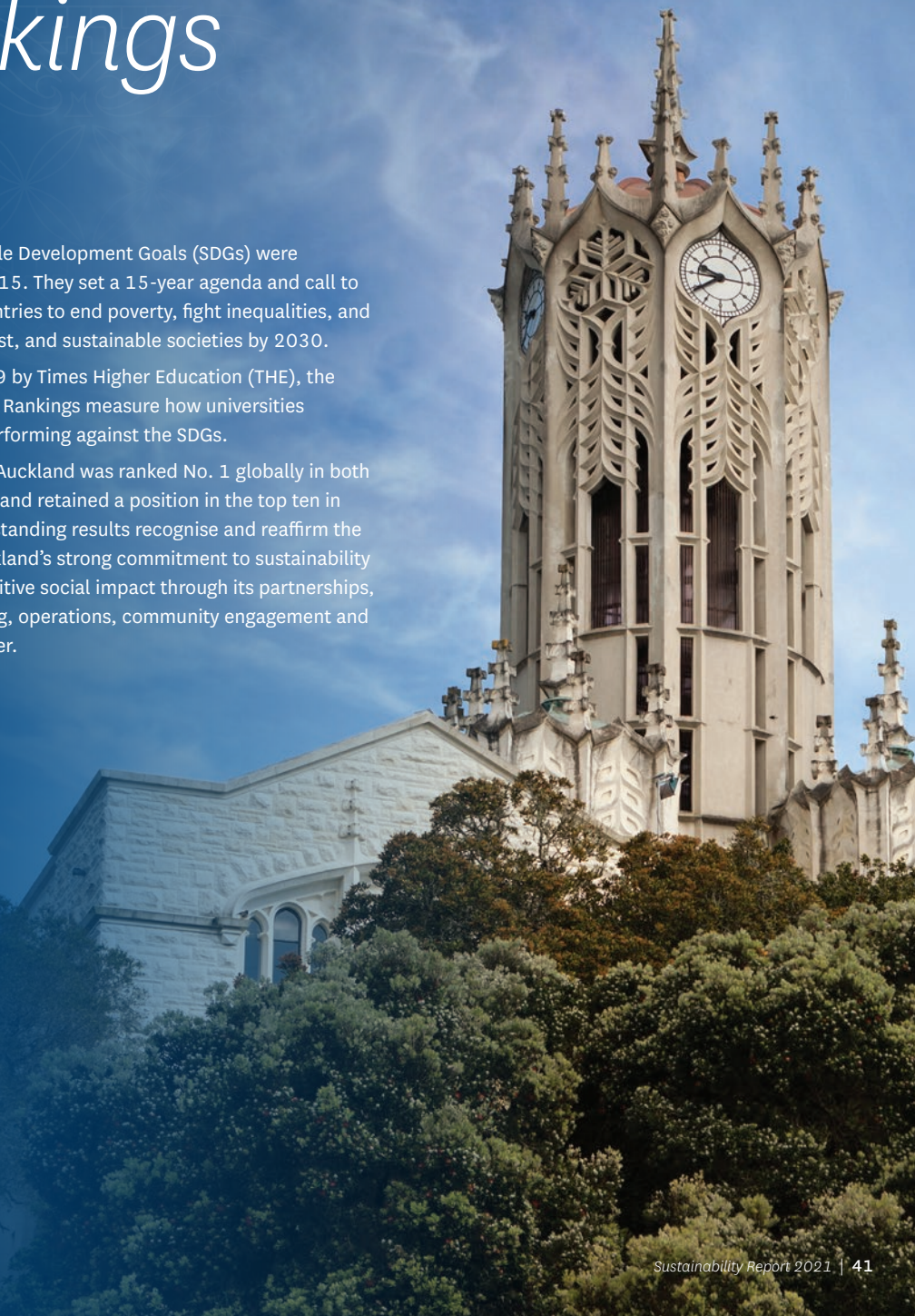
University Impact Rankings for the SDGs

Sustainable Development Goal	Our Ranking 2021
Overall ranking for impact	9th =
SDG 1: No poverty	43rd
SDG 2: Zero hunger	20th
SDG 3: Good health and well-being	8th
SDG 4: Quality education	71st =
SDG 5: Gender equality	13th =
SDG 6: Clean water and sanitation	25th =
SDG 7: Affordable and clean energy	29th
SDG 8: Decent work and economic growth	9th
SDG 9: Industry, innovation and infrastructure	60th =
SDG 10: Reduced inequalities	35th
SDG 11: Sustainable cities and communities	32nd =
SDG 12: Responsible consumption and production	13th =
SDG 13: Climate action	101st-200th
SDG 14: Life below water	32nd
SDG 15: Life on land	51st
SDG 16: Peace, justice and strong institutions	6th
SDG 17: Partnerships for the goals	20th =

The 17 Sustainable Development Goals (SDGs) were established in 2015. They set a 15-year agenda and call to action for all countries to end poverty, fight inequalities, and build peaceful, just, and sustainable societies by 2030.

Launched in 2019 by Times Higher Education (THE), the University Impact Rankings measure how universities worldwide are performing against the SDGs.

The University of Auckland was ranked No. 1 globally in both 2019 and 2020, and retained a position in the top ten in 2021. These outstanding results recognise and reaffirm the University of Auckland's strong commitment to sustainability and making a positive social impact through its partnerships, research, teaching, operations, community engagement and knowledge transfer.





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