




## Meet some QUT STEM Role Models

- There are many QUT role models harnessing STEM for sustainability and conservation, including in research, teaching, entrepreneurship, and management.
- Meet some of QUT STEM students and researchers:

Meet some QUT STEM Role Models	
Person + Photo	Brief Bio
 <p>WIT 2021 WOMEN IN TECHNOLOGY awards Winner</p> <p>Dr Kate Helmstedt</p>	<p>QUT's Dr Kate Helmstedt uses mathematics - including decision theory and operations research - to improve biodiversity outcomes from better conservation management.</p> <p>Ecological systems are incredibly complex! So, changing how those systems interact and evolve can have unexpected implications. To better understand these systems, and how management actions might affect them, Kate builds mathematical models of coupled ecological, land-use, and economic systems. This helps us understand the mechanisms driving success, failure, and efficiency of management actions.</p> <p>Better outcomes for the environment and society can be achieved by carefully, transparently, and defensibly planning management and policy interventions with maths, while acknowledging those complexities and the associated risks.</p> <p>Kate won the prestigious <u>Women in Technology (WIT) 2021 Rising Star in Science Award, 2021</u>.</p>
 <p>Dr Jacinta Holloway-Brown (pictured front right)</p>	<p>Dr Jacinta Holloway-Brown is passionate about using statistics and satellites to help monitor and progress United Nations Sustainable Development Goals (SDGs) for a better future.</p> <p>In her PhD, Jacinta used statistics and computing to solve the problem of missing data in satellite images - due to cloud cover. Jacinta's work is helping the Australian Bureau of Statistics, other National Statistics Organisations, and developing countries. She's enjoyed great opportunities, including working on an international team co-authoring a report for the UN, travelling to international conferences to host workshops to UN guests, including members of developing nations who want to use free satellite imagery for conservation, including to help monitor and protect forests.</p>
 <p>Dr Kate Saunders</p>	<p>Dr Kate Saunders is an expert in extreme value statistics - used to understand climate, weather and other extremes.</p> <p>Kate is particularly keen to better understand extreme weather events like floods and fires - to help mitigate negative effects.</p> <p>Her recent international research collaboration (with scientists from many STEM disciplines) helped quantify the increased risk of bushfires due to anthropogenic climate change. This information</p>

Dr Kate is pictured left with her colleague Dr Kiri Whan in 2019. who in 2021 were joint winners of the Harry Otten Prize for Innovation in Meteorology

was used in submissions in a bushfire Royal Inquiry and has been referenced in important policy documents - in Australia, Europe and for the UN.

In an exciting new project, Kate is teaming up with school citizen scientists to collect wind data using citizen weather stations (CWSs). This can help Kate build better weather models and predict bushfire behaviour. Hear more about this project and Kate's research in this **podcast**:

Kate also enjoys using her coding for fun and education. She created a CoronaSweeper app merging a game & modelling the spread of coronavirus. Learn more in this [video](#).



Tace Stewart

Tace Stewart is a QUT mathematics student, majoring in Operations Research with minors in programming and computational mathematics.

Tace completed a QUT Vacation Research Experience Scheme (VRES) project on the effect of discounting when scheduling biodiversity conservation actions.

She was then motivated to do more research in a Master of Philosophy, modelling the impacts of compound weather events for ecological decision making. Tace's research aims to help inform conservation decisions, including where to allocate limited resources for the best result. - to conserve smaller separate or larger contiguous areas.

Tace hopes to inspire and support more women in mathematics and runs their student society the **QUT Women in Maths Club**.



Grace Heron (right, in the field with environmental robotics researcher Professor Matthew Dunbabin)

Grace Heron has enjoyed working on many research projects during her mathematics studies at QUT.

She's enjoyed being out in nature and using technology, such as virtual reality and thermal imagery, to improve statistical modelling of vulnerable and protected species, or the health of our waterways - teaming up with people from different organisations and STEM disciplines to do so.

Now, Grace has commenced a PhD, and is hoping to help conservation efforts with a project "Quantifying the value of information from new monitoring tools in Antarctica"



Kanupriya Agarwal

Kanupriya Agarwal is interested in using mathematics to answer important scientific questions.

Kanupriya has worked on models of threatened species populations and predator-exclusion fences. For her Honours degree in Applied and Computational Mathematics, she focused on a threat to the Great Barrier Reef - the coral-eating Crown of Thorns starfish (COTS) - and modelling the COTs control effort on the Great Barrier Reef, for optimal spatial management (informing where best to take actions).



Dr Julie Vercelloni pictured above (right) with an AIMS collaborator Dr Emma Kennedy, receiving an 'Asia-Pacific Spatial Excellence Awards' (APSEA) award for Environment and Sustainability for ReefCloud.ai

Dr Julie Vercelloni applies her expertise in statistics and ecology to help conserve ecosystems including the Great Barrier Reef, Antarctica and Moreton Bay.

Julie enjoys collaborating with scientists, citizen scientists, and communities.

Julie has collaborated with the Australian Institute of Marine Science (AIMS) ([www.aims.gov.au](http://www.aims.gov.au)), on many exciting projects, including:

- AIMS' innovative and award-winning [ReefCloud.ai platform](http://ReefCloud.ai), which uses artificial intelligence to speed up classifications and allows reef scientists and managers to collaborate and share data in real time.
- The award-winning [Virtual Reef Diver platform](#), involving citizen scientists to help monitor the Great Barrier Reef, by sharing and/or classifying photos of the reef - for valuable observational data to improve models and predictions for monitoring the health of the Great Barrier Reef

Julie is enjoying maternity leave time with her baby and partner, and will return to research soon, including to work on an exciting new project for Moreton Play, exploring biodiversity and humans living and playing together.



Sarah Vollert (pictured as a National Science Week event guest speaker)

Sarah Vollert uses mathematics to help conservation. In her honours project at QUT, she sought to better understand coral growth in a changing environment with increased temperatures. She shared her research in a [talk for National Science Week](#). Now, she's started a PhD at QUT which contributes to the important Reef Restoration and Adaptation Program, bringing together experts to help the Great Barrier Reef ecosystem adapt in the face of climate change and other pressures. Sarah's work includes helping to inform decisions, and quantify uncertainty around predictions.



Katie Buchhorn

Katie dreams of STEM and is happy to share the wonders and opportunities STEM can bring, from her writing, spoken word, and research.

Katie Buchhorn is a mathematics graduate, who worked in industry for a few years, before becoming a PhD student at QUT.

Katie giving a TedX Talk on “[How mathematics helps humankind](#)”

Katie combines maths with creativity. She wrote and illustrated the book “**Wondrous Worlds: The Extraordinary Adventures of a Curious Mathematician**”, and tells this story as a spoken word poet.

With her PhD work, Katie ultimately wants to realise environmental benefits. Her current research relates to water quality in river networks. Sensors are used to measure and monitor water quality (including to help protect reef ecosystems). Katie’s work will help optimise how we collect and make sense of sensor data (including when it has anomalies).



Distinguished Professor Kerrie Mengersen

[Kerrie pictured on a research expedition to Peru, to help conserve jaguars, using technology, statistics, and local knowledge to help].



[Kerrie giving the Queensland Minister for the Environment a tour of QUT’s Cube showcasing research & citizen science]

Distinguished Professor Kerrie Mengersen is the Director of the QUT Centre for Data Science.

Kerrie’s superpower is harnessing data to answer questions, solve problems and create new value, algorithms, methods and tools. As a data scientist, she uses big data, from diverse sources, including sensors, expert information and crowd-sourced citizen science, to derive new insights and make informed decisions about challenging problems in health, environment, for governments, and industry. Her work has taken her around the world, from the Antarctic, across Australia, and to the Amazon. Kerrie is a Professor of Statistics at QUT, and leads the QUT Centre for Data Science. Kerrie has been elected a Fellow of the Australian Academy of Science, the Academy of the Social Sciences in Australia, and the Queensland Academy of the Arts and Sciences. She loves her job, supervising students and collaborating with others across disciplines and sectors.

Learn more:

- Kerrie gives a talk on [Cool jobs: statistics](#) at a past World Science Festival
- Kerrie talks about her virtual jungle project to help endangered Jaguars in Peru. Learn more from [Kerrie’s interview on Channel 7 News](#)




Professor Kerrie Wilson

Professor Kerrie Wilson is a leading environmental scientist and QUT’s Pro-Vice Chancellor of Sustainability Strategy, the first such academic role in Australia.

Professor Wilson is passionate about conservation of biodiversity and ecosystems, and her past roles include Executive Director of the Institute for Future Environments and the Director of the Australian Research Council (ARC) Centre of Excellence for Environmental Decisions.

Professor Wilson will deliver a keynote talk for UN Women Australia’s Women’s Day event on the theme “Changing climates: Equality today for a sustainable tomorrow’. You can watch the talk

	<p>on <a href="#">UNWomenAustralia - YouTube</a>. [It will be posted a few weeks after the event].</p> <p>Learn more</p> <ul style="list-style-type: none"><li>• <a href="#">Visit Professor Wilson's QUT profile</a> to learn more about her role, conservation and other research interests, and career here.</li></ul>
 <p>Leigh Burgess</p>	<p>Leigh Burgess is QUT's Sustainability Manager.</p> <p>Leigh helps realise QUT's sustainability goals in line with the QUT sustainability strategy. Leigh's work benefits from her breadth of experience across disciplines and her university qualifications in Environment Management, with a major in Sustainable Development. This qualification combines STEM and other disciplines, to provide a broad understanding of environmental challenges, plus problem solving skills and hands on community engagement experience. Leigh is passionate about developing and implementing sustainability initiatives.</p>