



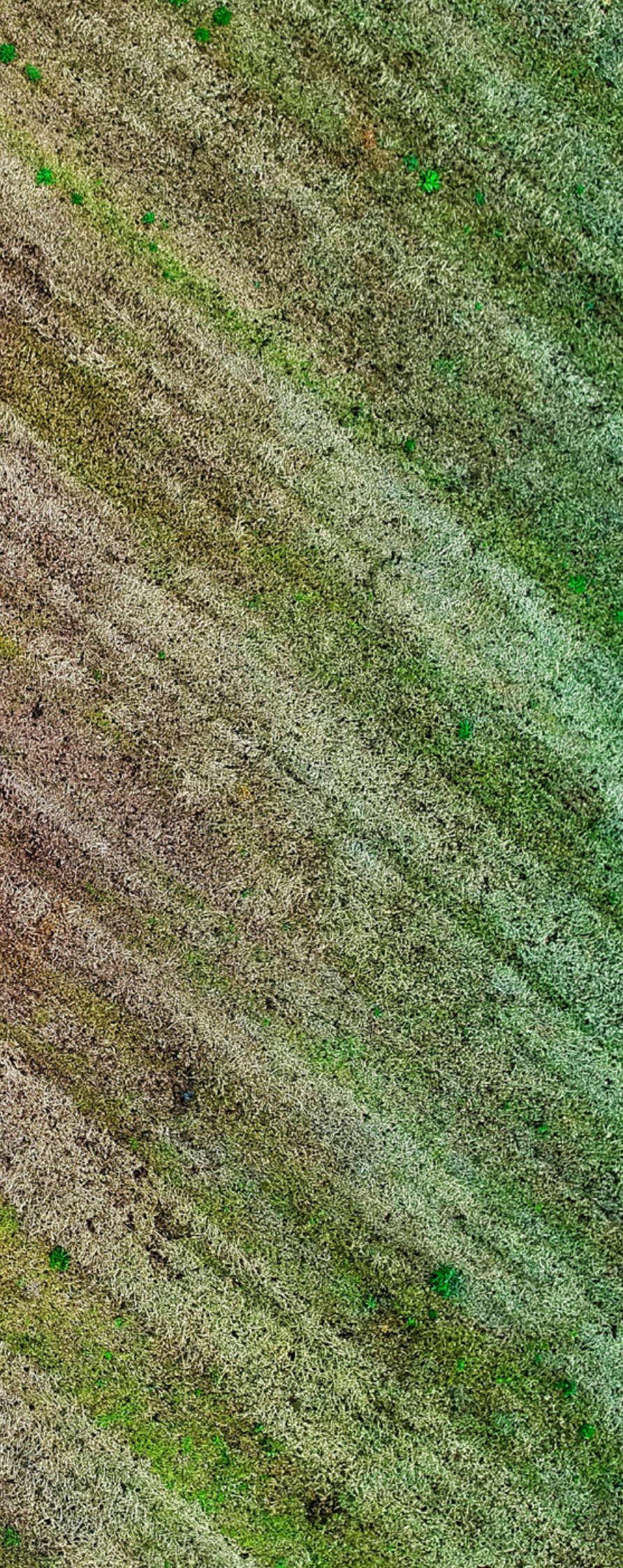
THE UNIVERSITY OF
MELBOURNE

Melbourne
Climate Futures

**Melbourne Climate
Futures Climate Research
Accelerator (CRX) projects
2021–2022**

Impact Report





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Executive summary

In August 2021, Melbourne Climate Futures awarded its first round of ‘sapling’ funding through its Climate Research Accelerator (CRX) program. The goal of the CRX funding is to support projects to make an immediate impact on the climate problem.

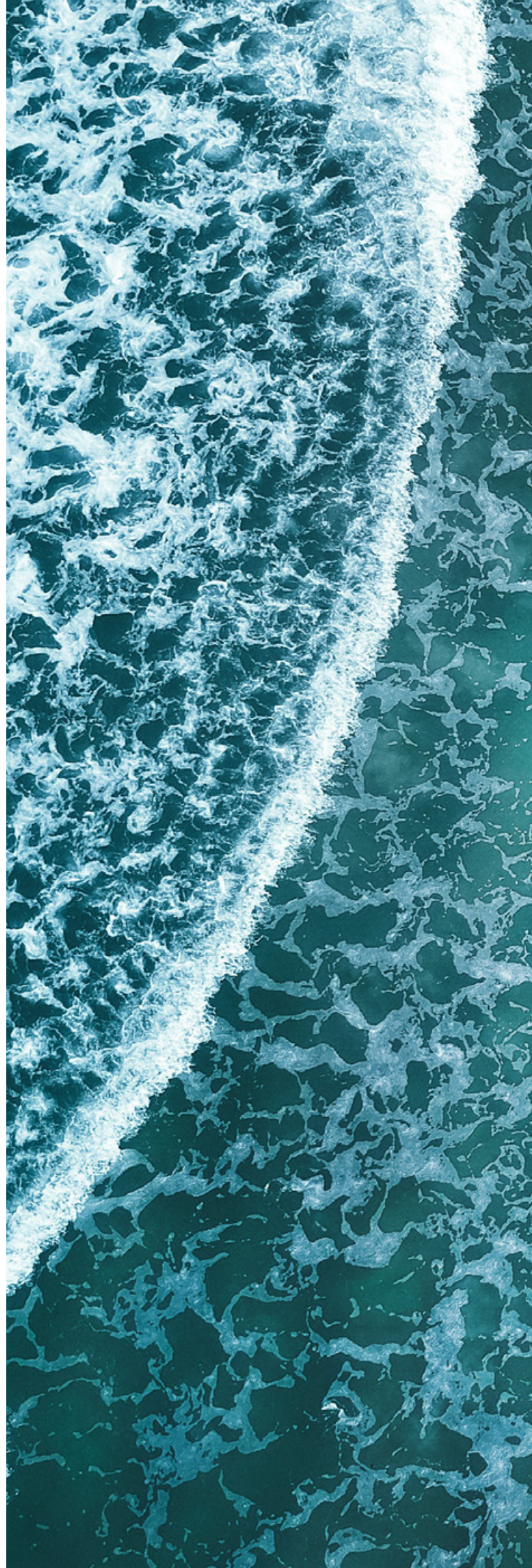
Eight diverse projects – already with a level of establishment – were funded \$50,000 to progress their research activities. All projects brought together interdisciplinary teams from across the University and external partners.

Project leads participated in a series of three workshops across 12 months. These workshops focused on stakeholder engagement, understanding and evaluating impact, and media engagement. The CRX culminated in a final showcase where all the project researchers presented their findings. These sessions facilitated spaces where researchers could collaborate in an interdisciplinary way to create novel methods of urgently addressing the climate crisis.

Each project provided final reports which captured research and engagement activities and impact stemming from the work, all of which were accelerated by this additional funding. This report provides an overview of that impact. Many of these projects are ongoing and will have further longer-term impacts that are not captured here. The CRX program is one of the ways that Melbourne Climate Futures seeks to curate and leverage research and enable partnerships and multidisciplinary connections.

2021–2022 Projects

1. Closing the land gap via ecosystem approaches
2. Creativity and Climate Futures: Establishing a creativity, ecology and community resilience studio (CECR) at Dookie
3. Investigating post-disaster community resilience through network analysis
4. Mothering in Crisis: Family, disaster and climate change
5. Scaling regenerative agriculture
6. Climate change policy and planning in school education in Victoria
7. Young people's climate change capitals
8. Downscaling hydroclimate projections to advance integrated land-sea planning

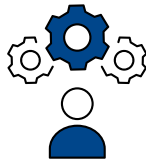


CRX at a glance

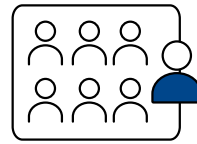
as of May 2023



8 project leads
from 5 faculties



**36 UniMelb
team members**
across 13 faculties



11 external
team members



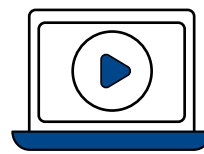
A\$400K
funding provided



3 capacity-building
workshops held



1,408
video views



2 video
content pieces



342 mentions
of projects in media



Closing the land gap via ecosystem approaches

Project Lead: Kate Dooley



The Land Gap Report

2022

This project has developed a new flagship [Land Gap Report](#) which examines the area of land required to meet projected biological carbon removal in national climate pledges and commitments.

The outcome

The report finds that almost 1.2 billion hectares (ha) of land – close to the extent of current global cropland – are required to meet the above removal. This finding shows that countries' climate pledges rely on unrealistic amounts of land-based carbon removal, which cannot be achieved without significant negative impacts on livelihoods, land rights, food production and ecosystems. The report has now put a number on the global demand for land in country climate pledges.

The need

“The CRX-funded activities kick-started the project so that the medium-term outcomes (a report and website) could be delivered.”

The CRX program accelerated the short-term outcomes of this project by providing funding for a Research Assistant to work on the Land Gap calculator, thereby enabling time to be spent on further fundraising efforts. In turn, this resulted in significant donor support that enabled a larger research team to work on the project through collaboration with other Universities.

Project outputs, engagement, and partnerships

- A 100-page report to present the data, related messages, and graphics.
- A methodology and database for the Land Gap Calculator, which now holds data for climate pledges from 166 countries plus the EU. This database has not been made publicly available, but an interactive map is being developed to provide access to the results.
- An official side event held at UNFCCC COP27 in Egypt on 11 November 2022 to discuss the recently published report.
- Social media strategy to amplify the report findings.

- Development of a **dedicated website** for the report.
- Three international stakeholder workshops, which brought together experts and stakeholders to feed into the development of the report – two online and one in person in Bonn, Germany.
- International collaboration on the report with partners from the Centre for International Forestry Research, the University of Copenhagen, Lund University, Griffith University, Bolivian Catholic University, and the University of Michigan.
- A group of donors established to support the report and the engagement of the collaborators listed above. Donors included the European Climate foundation, Climate and Land Use Alliance, One Earth, and KR Foundation.
- The developments enabled by the CRX grant provided grounds for an additional \$400,000 of funding, which allowed the project to include a comms team, a production team and paid researchers from collaborating universities.

Impact statement

The Land Gap Report has generated global media interest, sparking an immediate conversation around the role of land in achieving net-zero climate targets. Such a conversation is a critical first step to achieve the long-term project outcomes – raising awareness of the trade-offs involved in land-based mitigation and proposing solutions for climate mitigation options that promote sustainable land use (enhancing biodiversity, food security and securing indigenous and collective rights to land) – which should shift national strategies.

This project is influencing national, regional and international discussions and norm-setting around the role of land in national climate targets to further the implementation of the Paris Agreement. The CRX-funded activities kick-started the project so that the medium-term outcomes (a report and website) could be delivered. This has generated media interest that could lead to further national discussions, as well as international media and engagement in UNFCCC discussions. Longer-term goals include further stakeholder engagement for these discussions to lead to lasting systemic change around the role of land in climate mitigation.

* Full list of project team members: Peter Rayner, Brendan Wintle, Sivan Kartha, Matthew Stillwell, Doreen Stabinsky

Creativity and Climate Futures: Establishing a creativity, ecology and community resilience studio (CECR) at Dookie

Project Leads: Suzie Fraser and Danielle Wyatt



This project built on a collaboration between the Centre of Visual Art at the University of Melbourne and the Victoria Drought Resilience Adoption and Innovation Hub at the Dookie campus to establish some key strategies for imagining into more positive experiences of drought and other precarious climate events in the future.

The outcome

By working closely with community members in and around Dookie in regional Victoria, the project team has been able to demonstrate that creative practice, playfulness and imagination are invaluable tools for breaking down barriers between university research and pre-existing community knowledges to co-create more robust knowledges going forward. Arts practice has also been shown to enhance how we collectively navigate and adapt to uncertain climate conditions, strengthening our resilience as communities in the process.

Bringing together researchers from the arts and sciences and participants from campus and community, this project has successfully shown that collaborative approaches to thinking about how we will live in the future are invaluable to ensure we realise innovative, imaginative, and inclusive strategies together.

The need

“The CRX-funded portion of this ongoing project has been defining in building the momentum of our research.”

At its core, the project has been committed to overcoming disciplinary silos to more fully discuss the massive, changing and unpredictable conditions of climate change. The successes of drawing research stakeholders from various disciplines have been clear throughout this project, from allowing for innovative discussions around policy and preparedness to highlighting the project as radically distinct from comparative projects in climate, ecology and environment.

The CRX-funded portion of this ongoing project has been crucial in building the momentum of our research around creative contributions to community resilience. Through the funding, we have been able to spend intensive portions of time in 2021–22 working with the community and campus around Dookie to break down barriers between respective knowledges and start to collectively employ creative-led strategies for imagining positive experiences of our precarious climate futures.

In particular, this phase of the project has opened up opportunities to work between university research and community knowledges, revealing the time and collaborative necessities of bridging these spheres, particularly with regard to University research closely related to community resilience.

* Full list of project team members: Timothy Reeves

Project outputs, engagement, and partnerships

- Three workshops bringing together campus and community to collectively explore themes of climate crisis, resilience, Indigenous knowledge and agriculture, interspecies care, and how we imagine into uncertain futures.
- Staging a 'Dinner for the Future' in September 2022, a semi-performative gathering set two decades in the future in which the participants from campus and community experienced extended drought while also experiencing the positive and prosperous effects of new systems being in place to deal with drought in the future.
- Collaboration between community residents and the University of Melbourne campus in and around the Dookie area of regional Victoria, including 'getting to know you' and trust-building activities in order to open dialogue between knowledge holders across the institution and the public.
- Support and participation of two Yorta Yorta cultural leaders, Belinda Briggs and Neville Atkinson.
- Began conversations with Kaiela Arts in Shepparton, which are currently in progress as they move onto the next phase of the project.
- Established strong ties with the community around the Dookie campus and region, including framers, ecologists, and creatives. This led to a key working group comprising local artists committed to furthering the project into the future.
- Funding awarded in June 2022 from the Lord Mayor's Charitable Foundation to expand the project and present the findings in metropolitan Melbourne.
- Initial preparations are currently taking place to stage a participatory exhibition on the theme of 'Making Space for Common Ground' in September 2023. This next stage of the project will be focused on exploring how spaces for creative practice in our societies and communities will vitally strengthen resilience in the face of precarious climate futures.

Impact statement

This CRX funding has strengthened impact by allowing the participants to work closely with the Future Drought Fund and to feature as the only creative-led project in the 2022 Science to Practice Forum. By featuring in national media outputs and engagement activities related to the Future Drought Fund policy program, this project is contributing to strategies for climate preparations at a national level.

Moreover, by leveraging the CRX support to gain additional funding from the Lord Mayor's Charitable Foundation, this project has been able to platform the arts-led strategies being developed through this project across both regional and metropolitan Victoria. Cross-disciplinary collaboration will continue to be a cornerstone of this project as it progresses in the following 12 months.



Investigating post-disaster community resilience through network analysis

Project Lead: Colin Gallagher



This project examines the social networks of communities affected by the 2009 Victorian Black Saturday Bushfires, building on work first started in the Beyond Bushfires research project and researchers from the social networks laboratory of the University of Melbourne, in conjunction with collaborators at Swinburne and UNSW, to examine how social relationships “co-evolve” with recovery outcomes, such as mental health.

The outcome

The methods developed from this project stand to fundamentally advance the science of community resilience as a network-based phenomenon. With a feasible approach to surveying network-based community resilience in hand, the research team used these advances as a springboard for engagement with a range of recovery agencies, exploring how information on social connectedness in a community may aid recovery workers. The project leads are already in the process of engaging with disaster practitioners to ascertain the usefulness of network analysis in the community.

The need

“The CRX-funding quite literally accelerated this project by making our software run much faster.”

In a benchmark test, the code improvements led to a 37-fold speed-up in their ability to analyse community networks with missingness. Having these tools in place has helped to formulate and initiate a more detailed research plan for the coming years, including further software development and optimisation, data collection opportunities, and engagement with communities and practitioners.

The software optimisation from this project has the potential to greatly push forward the study of large-scale longitudinal networks. Discussions are now in place with developers of the RSiena software to implement the optimisations from this project into the main R code for the program. This will allow researchers to harness immense computing power to run large-scale analyses and will dramatically reduce computation times to make possible types of analyses that previously were computationally intractable.

* Full list of project team members: Johan Koskinen, Richard Bryant, Greg Poole

Project outputs, engagement, and partnerships

- Implementation of longitudinal models completed, driven by the Astronomy Data and Computing Services (ADACS) group being able to optimise the statistical modelling software for massively parallel computing environments. The **software changes** have been compiled and catalogued.
- Collaboration between the Social Networks Laboratory and ADACS, an internationally known software group that typically works on astrophysics' biggest questions (e.g., gravity waves). This collaboration is spawning new collaboration with researchers in Europe and Japan working on very large longitudinal network datasets. A description of this work has been profiled on **ADACS website**.
- Publication of reports and documentation arising from analysis and reporting of longitudinal results.
- Presentation of longitudinal results at INSNA Sunbelt conference. Work directly stemming from this project formed the basis for a series of three related abstracts at the INSNA Sunbelt conference. Two of these works are currently being drafted as manuscripts to be submitted for publication in peer-reviewed journals.
- Work done on the statistical model as part of this grant contributed to a manuscript accepted for publication: Sniders, Tom; Koskinen, J. *Multilevel Longitudinal Analysis of Social Networks*. Journal of the Royal Statistical Society: Series A.
- This project has resulted in newly developed capacity to deal with patchy network data. These methods have been directly incorporated into a newly formed research project between Dr Gallagher (with colleagues) on community recovery, funded by the Natural Hazards Research Australia (NHRA), Emergency Management Victoria (EMV), and Bushfire Recovery Victoria (BRV).
- The project will also have a reference group that includes representatives of the following:
 - National Recovery and Resilience Agency (NRRA)
 - Australian Red Cross
 - Dept Health and Human Services, Tasmania
 - Maroondah City Council
 - Yarra Ranges Council
 - Blue Mountains Community Resource Network
 - Leadbeater Group
- The project has produced key insights into the operation of PTSD on community cohesion and the diffusion of distress in a community (presented at conferences).
- This project has also been the lifeblood of the re-vamped Social Networks Lab at the University of Melbourne, playing a key role in the relaunch of a renowned group that had gone dormant in recent years.

Impact statement

This project has helped to develop an economical and widely applicable way to measure social structure in a community.

This has two primary benefits:

- A huge advantage in local implementation of community-level public health interventions. In these programs, the assumption is that information and health benefits diffuse through the community network. By actually mapping the network, it will be possible to improve the implementation of these programs in a particular local context, in which particular network features may impede (or enhance) the efficacy of intervention.
- By providing a standardised manner of mapping social structure, we gain a powerful new tool by which to measure and track the resilience of communities and better understand which are resilient to disruption and why. This will contribute to efforts to allocate resources more effectively.

In terms of longer-term impact, the two PhD students contributing to this project (Januar and Pattenden) have developed widely useful skillsets in computational social sciences, broadening their capacity to carry on this line of research into the future.



Mothering in Crisis: Family, disaster and climate change

Project Leads: Carla Pascoe Leahy and Julia Hurst



This project explores how climate change is impacting experiences of family life in the 21st century. Through in-depth oral history interviews, project researchers are examining the ways in which reproductive decisions and mothers' childrearing practices are being influenced by environmental crises.

The outcome

The research has found that parents bear an additional burden during disasters, and that mothers play a key role in taking emotional and physical care of children in such times. As the climate crisis intensifies, mothers are finding their childrearing roles increasingly impacted and will need additional help to continue supporting their families through an era of environmental change.

The need

“CRX funding has allowed this research to develop beyond the initial pilot phase.”

The CRX funding allowed this research to examine an under-recognised issue: that climate change and climate-fuelled disasters are impacting experiences and understandings of mothering. The activities and outputs of the project were primarily designed to:

- Expand academic and popular understandings of the impacts of climate change upon mothers.
- Provide research-based information to enhance disaster support services for families (findings have been shared with members of the Beyond Disasters Advisory Group; Children & Disasters Advisory Committee; Health, Environment, Research & Action (HERA) Collaborative; Victorian Department of Health & Human Services; City of Whittlesea; Women's Environmental Leadership Australia).

- Offer mothers an opportunity to share their experiences and contribute to improving understandings and supports (participants have commented on the benefits of being able to share their experiences through interviews. Project leads hope to run a pilot testing supports for mothers in 2023).

Interviews were conducted with mothers in the Gippsland region of Victoria, an area hard-hit by climate-fuelled disasters including the 2019–20 Black Summer fires. A comparative case study was also established in Wales, UK. These interviews explored what it feels like to be raising children in a time of multiple, overlapping environmental crises. Mothers have explained both the impacts of disasters upon their parenting and the strategies they are developing to navigate a period of rapid environmental change. Simultaneously, researchers have analysed archived interviews of how Australians have experienced disasters in the past, to evaluate whether there is something distinctive about the present moment.

Project outputs, engagement, and partnerships

- Several publications and presentations (see appendix 1); this research has been disseminated via public seminars, a final report, academic presentations and publications, media appearances and articles, and shared with key stakeholders.
- Five media appearances:
 - SBS World News, Jan 2023
 - ABC Radio Gippsland, 23 August 2022
 - 5AA Radio Adelaide, Jade Robran, 12 May 2022.
 - 3AW Radio Melbourne, Tom Elliot, 10 May 2022.
 - ABC Radio Hobart, 8 May 2022.
- Policy briefing report based on findings presented at Mothering in Crisis seminar, 2 December 2022.
- Research collaborations between Kristin Natalier, Mary Holmes and Carla Pascoe Leahy who have written and published one academic article and began work on another when Pascoe Leahy visited Holmes in Edinburgh in November.

* Full list of project team members: Kristin Natalier, Mary Holmes

- Established a relationship with gender historian Sarah Crook at Swansea, presenting to the Centre for Research into Gender and Culture in Society. Funding enabled the creation of a comparative case study in Wales, where 8 mothers were interviewed by Pascoe Leahy during her trip.
- Collaboration between historians Pascoe Leahy and Julia Hurst. They planned to undertake a short research trip to Gippsland to interview First Nations mothers, adding Indigenous voices to the interviews created, but this unfortunately proved impossible due to Hurst's work commitments.
- Pascoe Leahy's prior collaborations with researchers Catherine Gay (historian of childhood) and Anisa Puri (oral historian) have also been extended. In addition to providing important employment and professional development to a postgraduate student and early career researcher, these relationships will also deepen the research base of the project.
- Pascoe Leahy has also engaged with key stakeholders in the Children & Disasters Advisory Committee and the Beyond Disasters Advisory Group, and the Health, Environment, Research & Action (HERA) Collaborative. She has attended meetings with these groups across the year and invited them to the project seminar.

- Interactions with other researchers in the Melbourne Climate Futures Research Cluster has proven beneficial. Pascoe Leahy has met several times with Phoebe Quinn and Katitza Marinkovic Chávez to discuss their Young People's Climate Change Capitals CRX project. Phoebe and Kati also facilitated Pascoe Leahy's engagement with the Beyond Disasters and Children & Disasters advisory groups.

Impact statement

To date, climate change discussions have focused on readily measurable impacts on housing, infrastructure, industries and employment. There has been less recognition that climate change also influences our personal and cultural worlds. This project fills a critical gap in academic literature and popular understanding so that the full impacts of climate change can be measured and understood. Acknowledging that climate change also influences our experiences and understandings of family is a first step in beginning to understand what it means to be a mother in the twenty-first century, and what kinds of support mothers will require to support them through an era of intense and accelerating environmental change. This project has sparked understanding that adapting to climate change also means providing improved supports to families.



Scaling regenerative agriculture

Project Lead: Rodney Keenan



Conventional farming practices in Australia have placed increased pressure on the environment, impacting land and water quality and biodiversity. Environmentally focused or regenerative agricultural practices have been proposed as a solution to these problems. This project involves a multi-disciplinary team from the Faculties of Science, Business and Economics, and Veterinary and Agricultural Sciences working with Rabobank, Central Victorian Regenerative Farmers and finance sector experts.

The outcome

CRX funding provided the basis for development of the project with Rabobank, which aimed to (i) assess the benefits and costs of these practices and how they vary across farm production systems and climate conditions; (ii) explore relationships between sustainability measures and farm profit and productivity; and (iii) identify options for increased investment in these practices.

The need

“CRX funding provided the basis for development of the project with Rabobank.”

A project agreement was finalised and signed with Rabobank for \$125,000 to run until April 2023. Mosaic Advisory and Capital and the Central Victorian Regenerative Farmers Group are collaborators in the project. Project activities included:

- Working together over time to build trust and common understanding.
- The need to shift investment decisions from assessing past performance to factors that drive asset value and future farm financial returns.
- Integrating two very different value chains: the commodity production chain and the financial investment chain. This requires innovative approaches to make the investment case appealing.
- Enabling factors to drive increased investment in regenerative agriculture, including mechanisms for providing physical inputs, suitable professional services, benchmarking and forecasting tools, standards and reporting arrangements and securitisation tools.

* Full list of project team members: Natalie Doran-Brown, Richard Eckard, Oliver Miltenberger, Ben Neville, Brad Potter, Naomi Soderstrom, Phillip Cormie

Project outputs, engagement, and partnerships

- New relationships and strong partnerships between researchers in three faculties and between these researchers and the financial institution, Rabobank.
- Report produced.
- A research agreement with a partner bank on opportunities to increase investment in regenerative agriculture.
- Developed understanding of the farm value chain (from soil to plate) and parallel investment value chain (from wallet to gate).
- Developed proposal for a blended finance ecosystem to scale regenerative agricultural practices.
- Publications in farm policy, accounting and investment journals.
- Publication submitted to Strategic Finance.
- Draft publication prepared for *Australian Farm Policy Journal*.
- Presentation on a CRX panel as part of Melbourne Connect Innovation Week on 6 September 2022.
- The project has provided opportunities for lead researchers to develop stronger relationships with the finance sector and has provided opportunities for early-career researchers, and postgraduate students to engage actively with a leading international finance institution for agriculture (Rabobank)
- The project team has also developed connections with others working on this topic (such as **the National Farmers' Federation** and **Farming for the Future**).

Impact statement

This project has helped to develop a common understanding of farm and financial systems and the needs and challenges of the different actors in these systems. It has provided a basis for moving, monitoring, and reporting environmental practices on farm from a compliance focus to an investment value proposition. It has also instigated systemic change in the investment model for agriculture, moving from analysis of past performance to a future-looking model of risk adjusted returns based on plausible scenarios of practice change.

The project has built a strong working relationship between the University team in different faculties and between the University and Rabobank. Rabobank commented that “*this has become the most important University–Rabobank relationship outside of the Netherlands.*”



Climate change policy and planning in school education in Victoria

Project Lead: Marcia McKenzie



This project has helped launch a new ‘Environmental Sustainability in Schools’ policy for Victorian schools to advance sustainability and climate change action. The policy builds on the extensive history of sustainability education policy and practice in Victoria, including Sustainability Victoria’s ResourceSmart Schools initiative, and the work of a large network of government and non-government organisations that support Victorian schools to operate more sustainably.

The outcome

The ‘Environmental Sustainability in Schools’ policy for Victorian schools has been developed through a research-policy-making partnership between the Department of Education (DE) and researchers from the University of Melbourne (UoM). The partnership involved collaboration between DE policy experts, sustainability and climate change education researchers from the UoM and the international Monitoring and Evaluating Climate Communication and Education (MECCE) Project, along with input from sustainability education specialists at Sustainability Victoria. An extensive consultation process was undertaken with peak school bodies, youth organisations, school and student representatives, and a range of education and climate-change stakeholders to inform the development of the policy. The ‘Environmental Sustainability in Schools’ policy is an action under the Victorian Government’s *Education and Training Climate Change Adaptation Action Plan 2022–2026* (AAP).

The need

“Due to this project, the Victoria State government has an Environmental Sustainability in Schools Policy ... The CRX funded activities contributed directly to achieving this.”

CRX funding has contributed directly to the launch of this new policy, with accompanying action plan template, applicable to all government schools across the state. The policy promotes a whole-school approach, with an emphasis on engaging with Koorie/Indigenous knowledges and student-led action. The inclusion of these foci was fostered by the MGSE research team advocacy, based on the international research evidence. Sustainability Victoria, which runs the ResourceSmart Schools program throughout Victoria, has welcomed the policy and indicated it will adopt the action plan template and align its work with the policy going forward.

Project outputs, engagement, and partnerships

- **Policy development:** The project’s key deliverable, the development of an ‘Environmental Sustainability in Schools’ policy, is Action 6 under the Victorian Government’s *Education and Training Climate Change Adaptation Action Plan 2022–2026* (AAP). The AAP was endorsed by the Victorian Government Cabinet in February 2022. The policy is expected to be officially launched by June 2023 and will be available on the DE Policy Library website.

* Full list of project team members: Jeana Kriewaldt, Julie McLeod, Rhonda Di Biase, Ben Neville, Jane Dyseon, Sangeeta Chandra-Shekeran, Rebecca Spratt, Debra Barron, Jun Zhang, Nadia Han, James McCluskey, Linsey Hart, Cyrelle Field

- **Scoping workshop:** A scoping workshop to inform the policy development process was co-hosted by MGSE and DE in March 2022 involving members of the DE/MGSE project team and key government stakeholders, including the Department of Environment, Land, Water and Planning, the Victoria School Building Authority, and Sustainability Victoria.
- **Stakeholder consultation:** A stakeholder consultation plan was co-developed by the MGSE and DE team members in early 2022, including agreed key questions for stakeholders. The MGSE project team produced an analysis report of the consultation findings, integrated with key findings from relevant research. The report was endorsed by the DE and used to inform policy development.
- **School professional development:** In consultation with the DE, it was agreed to produce an 8- to 10-minute professional development video, to be published in the DE Policy and Advisory Library, alongside the new 'Environmental Sustainability in Schools' policy. The video explains the core components and principles of the policy and can be used as both a professional development and promotional tool.
- **Publication and presentations:** Includes an upcoming journal article and presentation on the project at the Australian Association for Research in Education Conference in Adelaide in November 2022.
- **New policymaker–researcher relationships:** Relationships have been built between MGSE staff (particularly staff involved in the MECCE Project) and key Victorian government stakeholders involved in climate change education, including staff at the Department of Education and Training, Sustainability Victoria, and the Department of Environment, Land, Water and Planning.
- **Growing Expertise:** This project has enabled MGSE and MECCE Project staff to provide expert input into the development of DE policy, and in ways that can support DE staff to expand their understanding of what constitutes 'quality' sustainability and climate change education policy around the world.
- **Collaboration across the University:** The project has provided the opportunity to collaborate across units at the University, such as between MCF, Education, Geography, and other areas.

Impact statement

The new 'Environmental Sustainability in Schools' policy will support all Victorian schools to operate more sustainably and prepare for the impacts of climate change. The policy development process has coupled the policy making expertise of the DE, the global sustainability and climate change education expertise of MGSE and MECCE Project researchers, and the local-practice expertise of the team at Sustainability Victoria and the selected school stakeholders engaged in the consultation process. The policy represents a steep change for Victoria. It builds on the state's strong record of school-based sustainability activity which has long been spearheaded by ResourceSmart Schools (and its predecessors), as well as lessons that have been learnt internationally. As part of the Education and Training Climate Change Adaptation Action Plan 2022–2026, the policy will be a vehicle for long-term change across Victoria's schools, a model for other Australian states, and will feed into global efforts to advance climate change education policy around the world through the MECCE Project.

Looking longer-term, we anticipate that the policy, coupled with its supporting operational guidelines and resources, will support all Victorian schools to take steps towards sustainability and climate action. It will provide the extensive network of Victorian sustainability education organisations, and government departments, with a policy 'hook' to advance their work, while also serving as a model policy for other Australian states and territories.

Longer-term outcomes:

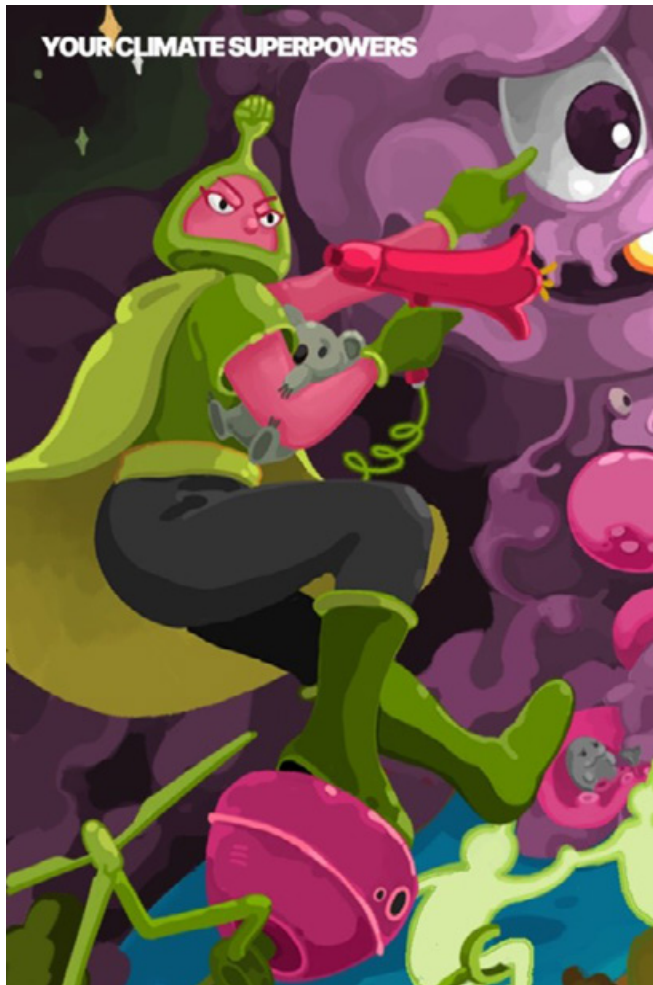
Policy launch and new policy institute: The new Environmental Sustainability in Schools policy is expected to be launched by the DE in June 2023. MGSE will be represented at the launch event, alongside other key stakeholders, and this will be another important opportunity for engagement.

Engagement with Sustainability Victoria: As a result of the relationship established through the CRX project, the Education Team at Sustainability Victoria has expressed interest in continuing engagement with the MGSE research team and the MECCE network. This includes the opportunity for the lead investigator to speak at a meeting of a nation-wide 'sustainability in schools' working group, to share research findings from the MECCE project, as well as discuss the development of the Victorian policy as a potential model for other Australian states.



Young people's climate change capitals

Project Leads: Phoebe Quinn and Katitza Marinkovic



This project aims to support children and young people in sharing their wisdom and creativity in dealing with climate change, applying a strengths-based framework and participatory approach. This project resulted in the [Your Climate Superpowers website](https://www.climatesuperpowers.org).

The outcome

Thirty-one children and young people aged 12–25 in Victoria, Australia participated in a series of 5 workshops to co-design a resource along with researchers from the University of Melbourne. An additional 70 young people contributed ideas through a forum event and online. The co-designers shared insights into the strengths and assets that young people have, and how these can be drawn upon and developed to help young people navigate the climate crisis. They also guided the format, visual design, and principles for the resource: empowerment, inclusiveness, sustainability, participation, transparency, clarity and youth-focus. This process resulted in the Your Climate Superpowers website (www.climatesuperpowers.org), Instagram account (@climatesuperpowers), and a subscriber list via Mailchimp. Through the website, young people can take a quiz to find out about their 'climate superpowers' – social, natural, built, political, human, cultural and financial. They can then explore ways they can use these superpowers by taking on 'secret missions' across four categories: learning about climate change, self-care, everyday action and transforming society.

The need

"This project 'accelerated' our lines of work in the field of children and young people's wellbeing in the face of climate change. Without it, we might have had to wait to be invited to participate as Early Career Researchers in projects led by other more senior researchers or design a project with a smaller participatory and community engagement component."

Children and young people are among the groups most affected by climate change, and they are often at the forefront of climate action. Every young person has unique skills, knowledge and ideas that are key to dealing with climate change. However, there are few resources made for and by children and young people on how to navigate climate change. The CRX funding enabled these early-career researchers to co-develop the Your Climate Superpowers website with young people, incorporating their views and artwork by a young artist. The concept of the seven 'climate superpowers' was adapted from an established community development approach known as the Community Capitals Framework (CCF). The CCF had previously been successfully adapted as a strengths-based, holistic framework for disaster recovery underpinning the multi-award-winning, evidence-based Recovery Capitals resources.

* Full list of project team members: Dianne Vella-Broderick, Janet Stanley, Lisa Gibbs, Karen Block, Claire Leppold

Project outputs, engagement, and partnerships

- Your Climate Superpowers website (www.climatesuperpowers.org), Instagram account (@climatesuperpowers), and a subscriber list via Mailchimp.
- Presented during the Australian Disaster Resilience Conference (AIDR) 2022 and the ICPHR Annual Working Meeting 2022, in August and September, respectively.
- Presented the work at a graduate researcher ‘mini-conference’ on sustainability on 1 September, a guest lecture in the Master of Public Health subject ‘Health Inequalities’ on 20 September, and a Melbourne Connect Innovation Week event on 6 September. The website was also presented at Screening Ideas on 6 October.
- Submitted an article about this project for the International Journal on Behavioural Development, in November (IJBD) for a special issue on climate change in November 2022.
- This project has given rise to two Masters of Public Health research capstone projects.
- Have shared details of the website, Instagram account and launch event with contacts from organisations and networks including: Cool Australia (an Australian curriculum resources organisation), Headspace, CERES, the Australian Youth Climate Coalition, School Strike for Climate, the Children & Disasters Advisory Committee, the Health and Environment Research and Action (HERA) group, the City of Melbourne, Yarra City Council, Darebin City Council, Maroondah City Council, and the Australian Disaster Resilience Network.
- Connected with a wide network of researchers across the University working on topics related to children, young people and climate change in policy and education. This has facilitated opportunities to disseminate the work and the website across the University, and with key stakeholders like the Department of Education and Training.

- This project has also led to the following collaborations and partnerships:

- Collaboration with Maribyrnong City Council and the Maribyrnong Youth Advisory Council on their Youth Climate Forum in May 2022.
- We are in discussions with Environmental Education Victoria about the potential to develop classroom or training resources for teachers based on the Climate Superpowers website.
- Working with Marcia McKenzie on the ‘Environmental Sustainability in Schools’ policy, which was also developed with CRX funding, to include information about the Climate Superpowers website as a resource for schools attached to the policy.

Impact statement

This project introduced a website for and by young people in Australia that integrates strategies on how to deal with climate change from a strengths-based framework. Feedback so far indicates that it will be a highly valued resource for young people that addresses the dimensions of learning about climate change, dealing with climate change in everyday life, participating in collective action and self-care.

The website will facilitate reaching out to young people and organisations for future projects, and we will be able to use it in further research as a prompt for discussions in participatory projects. We also expect this resource will become a valuable tool for educators who support children and young people in school and settings like scouts and environmental organisations. In this way, the project aims to contribute to promoting the wellbeing and empowerment of children and young people in Victoria in relation to the negative impacts of climate change.



Social Superpowers



Financial Superpowers



Built Superpowers



Cultural Superpowers

Downscaling hydroclimate projections to advance integrated land-sea planning

Project Lead: Rebecca Runting



Integrated cross-realm planning has emerged as a way to prioritise multiple management actions across the land-sea continuum with the aim of preserving essential ecosystem functions and services. Much progress has been made in recent decades to quantify connections between ‘realms’, such as the impacts of land-borne pollutants on marine ecosystems. However, planning strategies that explicitly account for future climate scenarios remain elusive. Accomplishing this requires several assessments of how ecosystems, and their connecting processes, might change under different future climate sequences. This was the aim of this project.

The outcome

The Paddock-to-Reef modelling team is a program jointly funded by the Australian and Queensland governments which unites more than 20 industry bodies, government agencies, Natural Resource Management bodies, landholders and research organisations. CRX funding facilitated crucial collaboration with this team to embed climate projections into their hydrological and water quality models. This not only accelerated

the timeline for a land–sea planning exercise that explicitly considers climate change, but it also accelerated the Paddock-to-Reef team’s medium-term goals of integrating hydroclimate projections into their modelling and reporting framework overall. The medium-term project outcomes rely on these projections and facilitate greater impact relating to decision-making in the Burdekin region, and for land–sea planning more broadly. CRX funding increased the impact of the PhD project and will assist in complex decision-making processes in the face of future uncertainty.

“Without CRX funding, the collaborative aspects of the project would have been stunted, reducing the impact of the PhD project overall and limiting the scope of engagement that has already proven to be beneficial to Schoenbaum’s and Runting’s careers.”

* Full list of project team members: Ryan Schoenbaum, Qichun Yang, Jore Alvarez-Romero, Stephen Swearer

The need

The CRX funding enabled this project to process and apply projections from the CMIP6 global climate models with further aims to quantify changes in run-off and water quality for one of the Great Barrier Reef (GBR) catchments – the Burdekin. This work will provide an assessment of how future climate scenarios might interact with different management actions strategies to mitigate the run-off of sediments and nutrients to the GBR – bolstering the reef’s resilience to climate change. Beyond this initial aim, the results will also inform an overall cross-realm planning exercise in the Burdekin region that accounts for multiple directions of inter-realm connectivity (e.g., run-off and sea-level rise), while spatially prioritising management actions targeting water quality, biodiversity, and carbon sequestration.

The CRX funding accelerated the timeline of this project, while also fostering the interdisciplinary and collaborative nature of this work. For example, a portion of the funding was dedicated to a workshop in Townsville, Queensland where we established connections with local stakeholders.

Project outputs, engagement, and partnerships

- Bolstered several interdisciplinary collaborations with many overlapping, climate-related goals.
- Hosted a multi-day workshop in Townsville, Australia to elicit information on data structures and format to implement downscaled climate projections in the Paddock-to-Reef hydrological models for the Great Barrier Reef catchments.
- This workshop led to the development of a GBR land–sea planning working group and informative exchanges in information between the resource management group in the Burdekin region (NQ Dry Tropics). This resource management group is tasked with implementing actions in line with our medium-term goals (the PhD project) and feedback from them ensures research quality and maximises applicability of outcomes to on-ground actions.
- Established new relationships between a variety of regional stakeholders (resource management groups, academic researchers, government, etc.) aimed at improving holistic management practices.
- Generated fit-for-purpose hydroclimate projections to integrate into a ridge-to-reef modelling framework.
- Elevated the PhD project on integrated land–sea planning, but also served as a substantial platform for the student’s (Ryan Schoenbaum) academic career, while also being beneficial for the supervisory team. Through this project, Ryan is now also a part of the Melbourne Climate Futures Academy with a strong focus on interdisciplinarity and collaborative approaches to problem solving.
- Has contributed to the development of novel skillsets in climate model post-processing and hydrological modelling (Schoenbaum), as well as the acquisition of essential professional/collaborative ties across institutions and government sectors from workshop engagement.
- Developing relationships to provide the foundation for a future linkage project application is of benefit to the entire project team, especially for Rebecca Runting, an early career researcher.
- Fostered collaborations within and outside of the University of Melbourne. For instance, Dr Rebecca Runting and Ryan Schoenbaum (SGEAS) are working with Cameron Dougall from the Department of Environmental Science (DES) and other Paddock-to-Reef modelling members. Both parties are clear on responsibilities and share enthusiasm for common end-goals.

Impact statement

This project has provided high-resolution, downscaled climate change projections across Australia out to the end of the century. A common issue with global climate projections is that they are too coarse to inform decision-making at the local/regional scale. This project outputs will be a critical step forward in guiding management actions for water quality improvements in the Great Barrier Reef basins. In addition, these outputs will extend benefits beyond the scope of the project into other areas of hydrological modelling and spatial planning, such as water resources and agricultural production.

The project leads will continue collaborating with the Paddock-to-Reef modelling group to direct them in incorporating climate change into their overall modelling and reporting framework for the GBR. It is estimated that this will continue through the second quarter of 2023 as the team calibrates the hydrological models and assess pollutant delivery to the end of catchments. As of March 2023, the Paddock-to-Reef modelling team is processing the down-scaled hydroclimate data and calibrating the catchment models against a baseline period. Ongoing collaboration with their team will enable this project to explore how different scenarios of climate change might affect local hydrology and pollutant delivery to the reef. This is an important step for this project, as well as the Paddock-to-Reef team’s long-term goals, which are to inform water-quality targets while accounting for climate change. Additionally, given that the spatial extent of the projections covers the entirety of Australia, the projections may be used to forecast regional hydrology beyond the scope of the Great Barrier Reef catchments. By examining potential future scenarios, the team can evaluate the efficacy of a multitude of actions in achieving water quality targets outlined in the regional Reef 2050 Water Quality Improvement Plan.

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