Office of the Prime Minister's Chief Science Advisor
Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia

Title:

REPORT: Annual report 2024 - Mahi Tahi 6 + Highlights from the last 6 years

Author:

OPMCSA

Output type:
PDF

Pages:
pp 64

Date:
Jun-2024

Language:
English

Review:
-

Versions

Record number:	*Version:*	*Date V1 created:*	*Date:*	*Printed version*
PMCSA-24-6-1-V1	V1	5-Jun-2024	5-Jun-2024	Y
DOI:	10.17608/k6.OPMCSA.25971730			
ISBN:	-			

Archive page link:
https://dpmc.govt.nz/our-programmes/special-programmes/prime-ministers-chief-science-advisor-archives/archive/gerrard-2021-2024

Notes:
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ANNUAL REPORT 2024

Mahi Tahi 6

+ Highlights from the last 6 years

Office of the Prime Minister's Chief Science Advisor
Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia

I orea te tuatara ka patu ki waho

TE KARERE A TE PIRIMIA

Opening remarks

From the Rt Hon Christopher Luxon

Image: Christopher Luxon and Juliet with the third food waste report.

It's been another busy year for Professor Dame Juliet Gerrard and the wider network of Chief Science Advisors. The robust scientific evidence and advice produced across the Chief Science Advisor and the network continues to be of vital importance to inform good decision-making.

When I look across the work Dame Juliet and her team has done over the past six years, I am very impressed by the breadth of issues covered – from antimicrobial resistance to rethinking plastics. Just looking at what Dame Juliet has delivered in the past year, I am very interested in findings on artificial intelligence in health care, equipping young people in the digital age, and the series of food waste reports.

Work on artificial intelligence in health care highlights its potential to enhance the healthcare system through improving back-office operations and in diagnostic support. Work on young people's resilience in the digital age is an important contribution to the body of evidence on equipping our young people to navigate the online world safely. And I read with interest Dame Juliet's detailed recommendations to minimise waste in the food system, and to make the most out of unavoidable food waste. The reference group for this work included around 500 stakeholders, demonstrating the level of interest here.

The Prime Minister's Chief Science Advisor plays a key role for me, in bringing the research and policy communities together and providing me with robust evidence. The role plays an important bridging mechanism between research institutions and policy makers to get evidence into policy.

I've been particularly impressed by Dame Juliet's collaborative approach and her ability to bring a wide range of stakeholders to the table. This has continued to help ensure that robust, credible science is firmly embedded into government decision-making. I would like to thank her for her outstanding contribution over the past six years.

Rt Hon Christopher Luxon

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Full page image: The meeting room wall at the Office.


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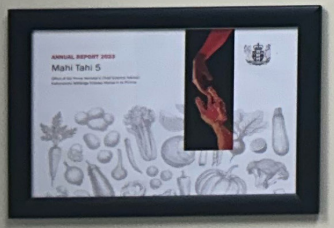
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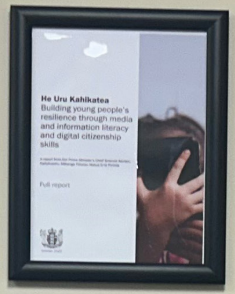
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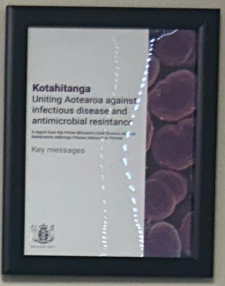
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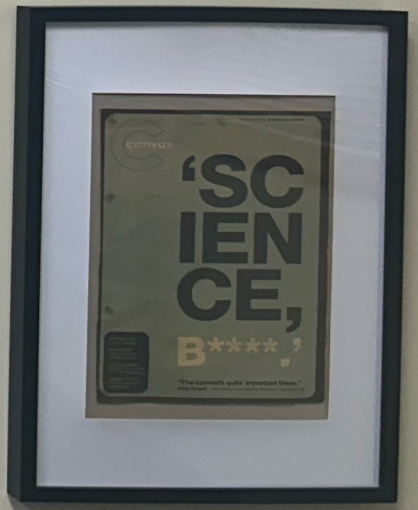

'SCIENCE, B****,'

FOREWORD

Ka mua, ka muri

Looking back at at her time as Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia, Juliet reflects on the past six years of science advice, evidence, communication, and conversation.

Tēnā koutou katoa, ngā mihi o te wā ki a tātou.

Ahakoa ngā ārai, ahakoa ngā aupiki me ngā auheke, mā te āta wānanga me te mahi tahi e whai rongoā, e whai rautaki kia anga whakamua ai tātou katoa.

Kei te ao hurihuri tātou e noho nei engari mā te titiro ki ngā rā o mua me ngā kōrero o nehe, kei reira kitea ai he oranga mō tātou.

Nā reira, anei ētahi pitopito kōrero.

As I come to the end of my second term it is fitting that I take a moment to reflect on the last six years. As the saying goes, the days are long but the years are short. In my time as PMCSA this has certainly been the case. The days at times felt long, attending various research and science kaupapa, generating science advice to support the PM of the day and other relevant decision makers, and maintaining relationships with the science community in Aotearoa and internationally, to ensure our advice has been consistent with global best practice while being tailored to our national context. Yet, six years have passed rapidly.

Possibly the biggest event during my time as PMCSA was the emergence of COVID-19, an unexpected (and unwelcome) disrupter. Much has been and will be said about the response and specific decisions made during that time, but my lasting reflection of that period is a response centred around the evidence and a country that banded together to look after one another. Our response was one of the most effective, evidenced by one of the lowest excess death tolls in the world. I am proud to have played a role in supporting researchers to provide evidence central to our response.

One of the first things I did when I stepped into this role was meet with the science community across the country, asking what things they identified as key issues and wanted to see me focus on. We had people write their ideas on post it notes, and back in our office created a collage (see page 59). These ideas and the broader work of the science community in New Zealand have been inspiring and we managed to pick many of them up in our reports. We can be proud of our science communities and their impact both here and worldwide.

A real highlight has been seeing many of the reports the Office produced moving from evidence

"Science, research, and evidence have never been more important than in this moment."

Image: The team and Food Waste Innovation Summer Interns (seated): Jackson McBreen (left) and Megan McKenzie (right).

to action. The plastics report, produced in my first term, was accepted by the government and included in the speech from the throne by the then Governor General, Dame Patsy Reddy. Many of the recommendations in that report, have been implemented (see page 43).

Some reports are yet to be implemented fully. My hope is that these reports are sources of information that can be used as the challenges identified within them continue to impact New Zealand. This includes our two most recent reports. The AI in healthcare report, which gives a vision for the future of our healthcare system that utilises AI, is an important stepping stone for wider work on ensuring that our healthcare system is fit for purpose in the future. The food waste project offers a comprehensive evidence synthesis and recomendations for how food waste could be reduced and how the waste that does occur could be used effectively and efficiently.

I have had the privilege of working for three Prime Ministers; each has brought their interest in and passion for different aspects of science. Ensuring the Prime Minister of the day, and their Ministers, have access to quality, evidence-based advice and research continues to be vital.

I want to acknowledge the wider group of people who have supported the Office and without whom the work wouldn't get done. To all the Chief Science Advisors (CSA) of respective Ministries, Agencies, and Departments who make up the CSA Forum, it has been a pleasure getting to work alongside you. I also want to acknowledge the interns and fellows over the past six years. Their projects have been inspiring. A deep and warm thanks to all the people who have worked in the OPMCSA team over the last six years. Thank you to my current team – Dr George Slim, Jacqui Barclay, Dr Rebecca Benson, Dr Emma Brown, Dr Jacques de Satge and Carolle Varughese. Particular thanks must go to my Principal Advisor, Dr Susie Meade, for all her tireless work and support.

Lastly, I want to emphasise the importance of science in 2024 and beyond. We are facing many challenges and opportunities, from AI to climate change where science will play a critical role. Science, research, and evidence have never been more important than in this moment.

Ngā mihi nui,

Juliet

"A deep and warm thanks to all the people who have worked in the OPMCSA team over the last six years."

WHO WE ARE

The team

Te amorangi ki mua, te hapai o ki muri.

The Prime Minister's Chief Science Advisor advises the Prime Minister on scientific evidence, acts as a conduit between the research community and government, and engages in activities to raise the profile of science in Aotearoa New Zealand. The Office, based at Waipapa Taumata Rau University of Auckland is non-partisan and independent of government, working to create a trusted bridge between science, society and government.

Read more about the team:

pmcsa.ac.nz/who-we-are/our-office

Professor Dame Juliet Gerrard DNZM FRSNZ HonFRSC started her second three-year term as the Prime Minister's Chief Science Advisor in July 2021. Guided by the principles of rigour, inclusivity, transparency and accessibility, she has continued to convene the cross-agency Chief Science Advisor Forum and deliver a work programme agreed with the PM each year. Juliet is seconded from her role as Professor at Waipapa Taumata Rau University of Auckland.

Image credit: Elise Manahan.

Jacqui Barclay is Juliet's office manager and EA and keeps the show on the road.

Dr Susie Meade is Juliet's principal advisor. With a PhD in Chemistry, more than 20 years' experience in research and management, a true passion for science, and an eye for detail, Susie is crucial to our mahi. She plays a key role in running the CSA Forum and became an expert at facilitating Zoom meetings during the course of the pandemic. Susie splits her time between Tāmaki Makaurau Auckland, Te Whanganui-a-Tara Wellington, and Ōtautahi Christchurch.

Dr George Slim is a senior advisor. With over 30 years' experience in academia, policy, small business and the public research sector, George is fluent in Academic, Bureaucrat and Commercial, and an able translator between them. This past year has seen George support our interns and keep us connected to folks in the capital from his base in Wellington.

Dr Rebecca Benson is a senior research and policy analyst. Her background is in neuroscience and quantitative social science, and she joined the Office in May 2023 after many years working at the intersection of research and policy at various universities in London. Rebecca completed her PhD in Public Policy at the University of Texas at Austin, and has a Master of Public Health from the Ōtākou Whakaihu Waka University of Otago. This year Rebecca has contributed to our project on AI in healthcare, and is project lead for our fourth report on food waste.

Dr Emma Brown (Ngāpuhi, Ngāti Maru, Ngāti Pūkenga, Ngāi Te Rangi) is a senior research and policy analyst. She completed her BE (Hons) at University of Auckland in 2013 and went on to work in the steel industry as a process engineer. Emma returned to the University of Auckland in 2017 to complete a PhD in the Chemical and Materials Engineering department, with a specific focus on biological tissue mechanics. This year Emma contributed to the AI in healthcare project before going on maternity leave.

Dr Jacques de Satge is a senior research analyst and writer. He has a background in environmental sciences, and recently completed his PhD in Conservation Biology at Te Kunenga ki Pūrehuroa Massey University. Prior to his PhD, Jacques worked and studied in Belgium, Germany, and South Africa, in disciplines spanning ecology, journalism, applied biology, and conservation. Trained in systems-thinking, Jacques is adept at problem solving across multiple scales and contexts. He led our third report on food waste.

Carolle Varughese is a research analyst and writer, and the newest member of the team. Having worked at high schools, universities, and not-for-profit organisations, she blends her public policy, education, and physics expertise as a science communicator and outreach specialist. Carolle completed her Master of Public Policy at University of Auckland, focusing on space policy in Aotearoa. She contributed to the AI in healthcare report, the third and fourth food waste reports, and annual reports.

Colson Verdonk was a research analyst and writer. The Office said haere rā to Colson at the start of 2024. Prior to joining the Office, Colson worked as an advisor to a Member of Parliament. Colson has an academic background in environmental science, geography, politics and international relations, and social science for public health. He led the project on building young people's resilience.

WHO WE ARE

Chief Science Advisor Forum

He Rauhinga Tohu Pūtaiao. Ehara taku toa i te toa takitahi, engari he toa takitini.

The PMCSA convenes a forum (the Forum) of CSAs from across government departments, ministries, and agencies. The Forum, which meets around ten times a year, receives additional support from co-opted members and connects widely with the research community to ensure it can provide comprehensive advice and build an extensive range of expert contacts. Subgroups of the Forum also come together periodically to provide specific advice on cross-sector issues.

Over the last six years the Forum has made a valuable contribution across government, with each CSA bringing their departmental knowledge and connections to the table. Dr Gill Jolly, the CSA for Ministry of Business, Innovation and Employment (MBIE) has stepped into the role of co-chair of the Forum alongside Juliet over the past year.

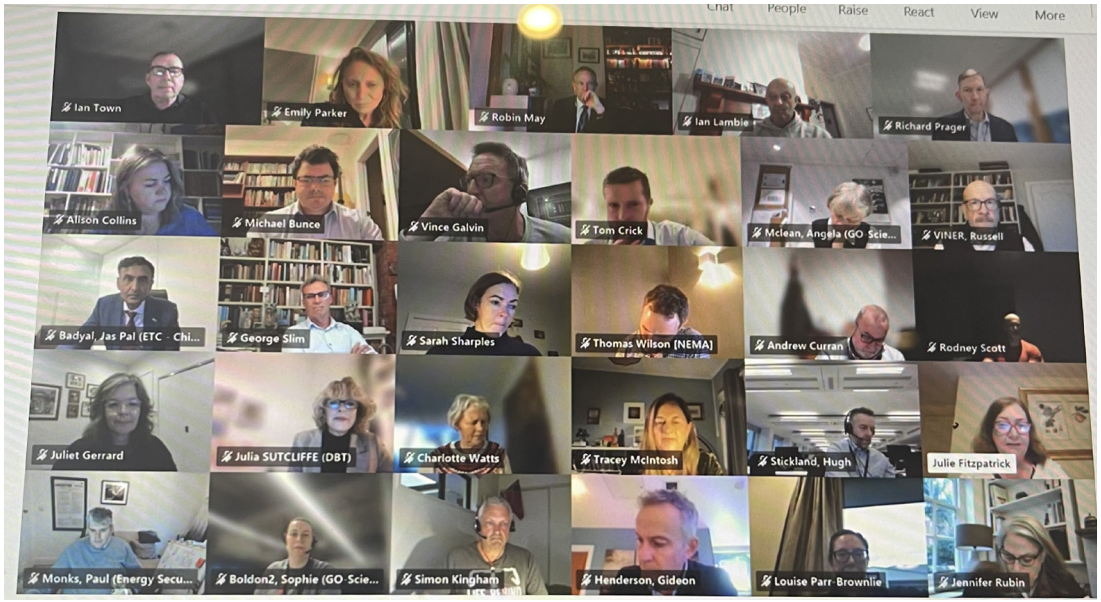


Image: The Forum in a joint meeting with their counterparts in the UK in 2023.

Meet the CSA Forum

Professor Dame Juliet Gerrard DNZM FRSNZ HonFRSC – PMCSA, Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia

Dr Gill Jolly – Co-Chair, Chief Science Advisor, Hīkina Whakatutuki Ministry of Business, Innovation and Employment

Professor Michael Bunce – Chief Science Advisor, Te Papa Atawhai Department of Conservation

Dr Alison Collins – Departmental Chief Science Advisor, Manatū Mō Te Taiao Ministry for the Environment

Dr Chris Daughney – Chief Science Advisor, Te Uru Kahika - Regional and Unitary Councils Aotearoa

Vince Galvin – Chief Methodologist, Tatauranga Aotearoa Statistics New Zealand

Jim Graham – Chief Science Advisor, Taumata Arowai, New Zealand's national drinking water regulator

Erica Gregory (Waikato, Ngāti Maniapoto) – Manahautū, Kaupapa Kura Taiao Environmental Protection Agency

Professor Simon Kingham – Chief Science Advisor, Te Manatū Waka Ministry of Transport

Professor Ian Lambie ONZM – Chief Science Advisor, Tāhū o te Ture Justice Sector

Professor Stuart McNaughton ONZM – Chief Education Scientific Advisor, Te Tāhuhu o Te Mātauranga Ministry of Education

Professor Tracey McIntosh (Ngāi Tūhoe) – Chief Science Advisor, Te Manatū Whakahiato Ora Ministry of Social Development

Tim Ng - Strategic Economic Advisor, Te Tai Ōhanga The Treasury

Dr John Roche – Chief Science Advisor, Manatū Ahu Matua Ministry for Primary Industries

Dr Kay Saville-Smith MNZM – Chief Science Advisor, Te Tūāpapa Kura Kāinga Ministry of Housing and Urban Development

Dr Rodney Scott – Chief Policy Advisor and Chief Science Advisor, Te Kawa Mataaho Public Service Commission

Professor Ian Town FRACP – Chief Science Advisor, Manatū Hauora Ministry of Health

Professor Tom Wilson – Chief Science Advisor, Te Rākau Whakamarumaru National Emergency Management Agency

For full bios and more info on the CSA Forum, visit

pmcsa.ac.nz/who-we-are/chief-science-advisor-forum/

Navigating the transition

Dr Gill Jolly reflects on lessons learned in her year as forum co-chair.

This year I have been privileged to co-chair the CSA Forum with Juliet. A consistent theme for me has been transition; a personal transition from working in a research organisation to inside of government, navigating the transition between two governments, and identifying pathways for discussions on long-term policy transitions. As the saying goes – "there is nothing permanent except change".

I have had a tremendous learning journey as I have come to grips with building relationships and understanding processes within the public service. I have been very impressed by the quality and dedication of the public servants who often get little credit for the largely invisible policy work that they do.

When I started at MBIE in July 2023, my top priority was to focus on Science System reform (at the time this was through Te Ara Paerangi) and the National Research Priorities in particular. With the change of government and the establishment of the Science System Advisory Group, MBIE's work pivoted to support the new Minister and provide quality evidence and advice on new focus areas.

I have thoroughly enjoyed supporting Juliet in her role as PMCSA as co-chair of the Forum and through collaborating with the other CSAs. Highlights have included chairing a meeting with the Chief Economists and thinking about how the two groups of advisors can work more closely together and discussions on lessons learned from the first round of Long-term Insights Briefings (LTIBs) with the Department of Prime Minister and Cabinet (DPMC). This exercise with the DPMC reinforced the importance of making time to step back from day-to-day busyness of policy development. These foresighting exercises give us the chance to look to the horizon to identify the future risks and opportunities for Aotearoa.

Finally, I would like to extend a huge vote of appreciation to Juliet for her calm, insightful, and courageous leadership of the Forum over the last 6 years. Science provides a critical evidence base to respond to immediate issues and to support future policy development; Juliet has navigated diverse challenges to give free and frank advice whilst retaining an untiring sense of humour.

Ngā mihi nui Juliet!

"A consistent theme for me has been transition; a personal transition from working in a research organisation to inside of government, navigating the transition between two governments, and identifying pathways for discussions on long-term policy transitions."

Emissions reduction in the transport sector

Professor Simon Kingham reflects on his tenure as the CSA for transport.

An enduring challenge for the New Zealand government is how to reduce greenhouse gas emissions. By signing up to the Paris Agreement of the United Nations global agreement on climate change we committed to reducing greenhouse gas emissions by 50 per cent below 2005 levels by 2030. A key tool to meet these targets was the *Climate Change Response (Zero Carbon) Amendment Act (2019)* which saw the establishment of a Climate Change Commission, who were required to set five-year emission budgets, and the creation of Emission Reduction Plans (ERP) to meet these targets.

Image: Simon on a bike.

Initially, government departments were given responsibility for developing ERPs in their own ministries and sectors; the Ministry of Transport (MoT) led work on delivering emissions reductions in the transport sector. Evidence was needed to inform possible policy options. The approach used was the Avoid, Shift, Improve framework. Avoid describes how we can make it easier for people not to travel, such as changing our urban form to reduce the need for long journeys; Shift is all about encouraging people to use different, low carbon, modes such as walking, cycling and public transport; and Improve is about decarbonising our fleet, for example by encouraging the uptake of electric vehicles, both private and freight.

Evidence was needed on how well policies would work to deliver emissions reductions. Primarily we wanted to know what would be the impact on emissions of new walking and cycling initiatives, clean vehicle incentives, and changing urban form? A second strand of evidence was also needed on the co-impacts of different policies. The MoT has an Outcomes Framework[1] stating that we seek a "transport system that delivers wellbeing and liveability" and includes five outcomes: Economic Prosperity, Inclusive Access, Healthy and Safe People, Environmental Sustainability and, Resilience and Security. Evidence is necessary to identify the emission reduction policies that deliver against multiple outcomes, not just delivering the singular goal of reductions in emissions. For example, incentivising the uptake of electric vehicles is good for emissions but will probably deliver less of the other outcomes. Conversely, encouraging walking and cycling will simultaneously enhance health and wellbeing, and can aid inclusive access.

The approach has now moved away from being a sector led to a more whole of government approach, with a focus on a net reduction in emissions. A refinement of the nature of the evidence will be necessary moving forward.

1 transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/

Looking back at our Futures Thinking

Professor Mike Bunce, CSA for Department of Conservation (DOC), describes some of the key outcomes from the DOC/Toitū Te Whenua Land Infortmation New Zealand (LINZ) LTIB.

2023 saw each government ministry/department publish a LTIB. This was a new initiative put in place by the Public Services Commission in 2020 and encouraged central government to "think about medium- and long-term trends, risks and opportunities." As science and evidence played a key role in the reports, it was commonplace to see members of the CSA Forum involved in planning, writing and reviewing these briefings.

The Public Services Commission expected that LTIB's, while not being government policy, would set out the strengths and weaknesses within a chosen topic area. The LTIB process required agencies to conduct two rounds of public consultation to provide ample opportunity for external input. While no agency can predict the future with any certainty, it can use science, modelling and 'futures thinking' to be better prepared, plot, or imagine preferred pathways.

I was closely involved in the generation of the DOC LTIB. For this briefing, DOC collaborated with LINZ to explore new technologies that might aid us in protecting and preserving the biodiversity of Aotearoa. At the core of this LTIB was an exploration of innovative ways to 'listen to nature' more effectively and interweave emerging technologies with existing approaches (including mātauranga).

Through public consultation and engagement, the DOC/LINZ LTIB ended up focusing on the opportunities, risks and issues surrounding three emerging areas: (i) remote sensing, (ii) genetic technologies and (iii) AI.

"While no agency can predict the future with any certainty, it can use science, modelling and 'futures thinking' to be better prepared, plot, or imagine preferred pathways."

As well as exploring acronym-rich developments in technologies - such as eDNA, LiDAR and AI - what became immediately apparent is that to progress any of the technologies supporting effective data collection, data management and interoperability is crucial. The briefing effectively

"...are we ready for the data challenges that sit alongside the uptake of these new technologies?"

poses the question 'are we ready for the data challenges that sit alongside the uptake of these new technologies?'

The DOC/LINZ LTIB was discussed at a joint environment and primary production select committee in May 2023. A full list of all the agency LTIBs are available at the Public Service Commission website.[1] As this annual report was being drafted, the first cross-agency workshop was held for the next round of LTIBs, which are to be published every three years.

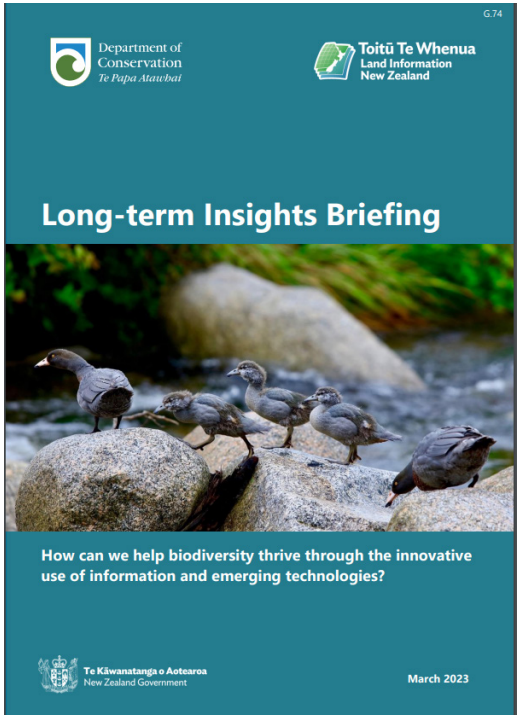


Image: Long-term Insights Briefing cover page.

1 publicservice.govt.nz/publications/long-term-insights-briefings/published-briefings

There's lots we need to know about drinking water science

Jim Graham, CSA for Taumata Arowai, our new Forum member, reflects on the challenges ahead.

Drinking water infrastructure has had a lot of attention in recent years but there has been much less focus on the science and public health foundations on which safe drinking water is built. Interestingly, the science and our understanding of public health risk can change, often quite quickly. For example, in the 1980s it was thought that protozoa would never be the cause of water-borne disease, but after a significant outbreak in Milwaukee in the United States in 1990 which resulted in many deaths from cryptosporidiosis, that view changed. This is an extreme example, but when the modern drinking water standards were released by the Ministry of Health in 1995, the need for a barrier to protozoa contamination was a key part. The maximum acceptable values (MAV) of contaminants that can be found in drinking water also will need to be continually adjusted as new information about the health effects informs our understanding.

Taumata Arowai is New Zealand's water services regulator, in operation since 2021. It was set up after the campylobacteriosis outbreak in Havelock North resulted in more than 8,000 cases of illness and four deaths. There are numerous relevant science-related questions that Taumata Arowai is interested in understanding and which require further investigation. Generally, New Zealand doesn't have the resources to fully investigate all things to do with water science and we tend to follow the work that is undertaken by the World Health Organisation (WHO) or United States Environmental Protection Agency (USEPA). That work, however, doesn't tell us about the unique circumstances in Aotearoa and how those circumstances impact our drinking water.

"New Zealand doesn't have the resources to fully investigate all things to do with water science"

Some science-related questions we would like to understand better

PFAS, or per- and polyfluoroalkyl substances, provide a good example of a scientific area that needs further consideration. These substances are a class of thousands of chemicals which repel water, oil and grease and are used in hundreds of everyday products from dental floss to cookware to firefighting foams. They can also be found in drinking water sources. The USEPA has recently set new limits for PFAS chemicals in water of 4ppt. That's parts per trillion, an incredibly low limit. Apart from a small study undertaken by ESR a few

years ago, we don't know the level of PFAS substances in drinking water supplies in New Zealand and the risks to consumers. Further research on this topic is needed to understand the implications for Aotearoa.

Lead in drinking water is another contaminant that has received recent attention globally. The WHO has stated that there is no safe level of lead consumption and the European Union and some states in the United States have recently reduced the concentration of lead permitted in drinking water by 50 percent. There have been calls for New Zealand to do the same. It sounds simple but grounding any changes in robust science and understanding of our unique environment is important. We first need to understand the concentrations of lead in New Zealand drinking water. Then, whether they are stable or if they fluctuate and, if so, what causes them to change. After this, we will need to decide what we expect water suppliers to do if they have elevated lead levels in their networks.

Ways we are working to understand and answer some of these questions

To begin to address these questions, when Taumata Arowai released its first Drinking Water Quality Assurance Rules in 2022, it required for the first time that water suppliers test their networks for lead and a range of other metals. Analysis of that initial data will inform further research to determine what our response should be in adjusting the MAV in our drinking water standards.

Not a lot is known about viruses in groundwater that is used for water supply in Aotearoa. To improve our understanding, Taumata Arowai has commissioned ESR, in collaboration with Christchurch City, Environment Canterbury and Ngāi Tahu, to undertake a significant 12-month survey of groundwater in Canterbury. The intention is to determine what, if any, viruses are present and to try to identify a low-cost indicator of viral contamination.

In mid 2024, Taumata Arowai will publish its third *Drinking Water Regulation Report*. This will be the first report to use data that water suppliers have collected over the previous year to demonstrate compliance with the Drinking Water Quality Assurance Rules. The report will provide an interesting picture of the quality of both the water abstracted for drinking water supply and the treated water that is provided to consumers. Taumata Arowai will use the information from the report to inform engagement with suppliers and any outreach activities we deliver.

In March 2024, Taumata Arowai, in collaboration with Water New Zealand and the University of Auckland, organised a Drinking Water Science Forum held in Wellington. The idea behind the forum was to bring together people from Crown Research Institutes, government departments, universities and water suppliers to share information about water research that was underway and to begin a discussion about how greater collaboration and coordination for drinking water science could be achieved. The PMCSA also attended and spoke to the forum. Another forum will be held later in 2024 with the goal of discussing the areas of drinking water research that are a priority – research that will inform policy, standards, and the actions that water suppliers need to take to ensure the water they supply is safe for all.

There is still a lot we don't know. But the hope and expectation is that a strong and connected water science understanding, that underpins sound public health action, can contribute to the prevention of water-borne illness and outbreaks like those that occurred in Milwaukee 33 years ago and Havelock North only seven years ago.

"...[research] will inform policy, standards, and the actions that water suppliers need to take to ensure the water they supply is safe for all."

Improving access to science advice in emergency responses

Science advice is an important part of responding to, and recovering from, disasters. Ensuring that the advice is given in a timely manner and reaches the right people to help them make decisions, often in very difficult conditions, is challenging. Historically the emergency management system in New Zealand has been fragmented, with responsibility for decisions distributed across local bodies and central Government, and no single place for science advice to land. As I took up the role of PMCSA, the Ministry for Civil Defence and Emergency Management (MCDEM) was being reviewed to be replaced by the National Emergency Management Agency (NEMA) in 2019. NEMA is not a stand-alone ministry but sits within the DPMC. As the new Agency got underway, the Office threw its weight behind having it take on a CSA, a conspicuous gap within MCDEM. This ultimately led to the appointment of Professor Tom Wilson as CSA for NEMA in 2022.

In the meantime, I was called in to help with advice around the Whakaari-White Island eruption in December 2019. Although this was a regional event, its tragic nature, with 22 people killed and 25 injured, some of them very badly, led to a full Government response. The event highlighted the need for people who could bridge the worlds of science and policy. Information provided by scientists, who had been working in the area for many years and knew it well, needed to be translated into material that could be quickly understood by politicians and responders. Decisions with significant humanitarian and

"...[information] needed to be translated into material that could be quickly understood by politicians and responders."

political impacts had to be made quickly, so a clear understanding of the facts and the underlying uncertainties was essential.

Of course, the next national emergency was COVID-19. The Office and the Ministry of Health (MoH) watched international concerns rise through December 2019 and January 2020, and worked across Government as the pandemic swept around the world in February and March. This time the science wasn't well understood, and science advice was given against a background of significant gaps in the evidence. Many of the decision-makers were unfamiliar with the basic concepts of infectious disease and needed to be brought up to speed. The involvement of the Office has been described in *Mahi Tahi 4*[1] but COVID-19 highlighted the difficulties when an emergency comes from nowhere and the science community is scrambling for answers to inform action, sometimes getting them wrong. Part of the Office's response was working with MBIE, Science New Zealand, and Universities New Zealand to build a database of relevant science projects[2] and ensuring that relevant experts were connected to decision makers. It seemed at the time that there had to be a better way than building the database from scratch.

In the aftermath of the North Island Extreme Weather Events, the Auckland anniversary weekend flooding in Auckland on 27 January and Cyclone Gabrielle striking the upper North Island over 9-11 February 2023, we found ourselves doing the same thing again.[3] There was a huge need for geospatial data to determine what the immediate impacts were and how the response could focus on those worst affected. Building on the COVID-19 response, it was easier than it had been but still there were overlaps and competing requests for data while scientists were busy with the response. This time efforts were vastly improved by having Tom in place in NEMA and the support of Dr Chris Daughney (CSA, Te Uru Kahika). However, a number of ad hoc solutions to collection and storage of data were required to make it available to those who needed it, and MBIE made some quick calls to ensure that the science response was resourced. It could have been much more efficient if processes had been in place beforehand.

The involvement of the Office in these responses has highlighted the need to have processes for the delivery of science advice to decision makers, an overview of what data is available and what needs to be done, and relationships between providers of science advice and decision makers, ready to go before disaster strikes. In the face of the increasing impacts of climate change and other global challenges, having processes in place before an emergency is essential. Connecting science to decision makers, and building the trusted relationships that are vital to receiving actionable advice, in the heat of an emergency response, is fraught with difficulty and bound to leave gaps. To address this issue, the Office has been working with Tom and the other CSAs in the Forum on a paper with recommendations, based on lessons learned, on how to establish processes before they are called on. We hope that the recommendations will be used by NEMA, DPMC, local bodies, science institutions and funding agencies to improve the science response to the next and all future emergencies.

"In the face of the increasing impacts of climate change and other global challenges, having processes in place before an emergency is essential."

1 cpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2022/07/Mahi-Tahi-4-Online-update-.pdf

2 mbie.govt.nz/science-and-technology/science-and-innovation/research-and-data/nzris/covid-19-research-database

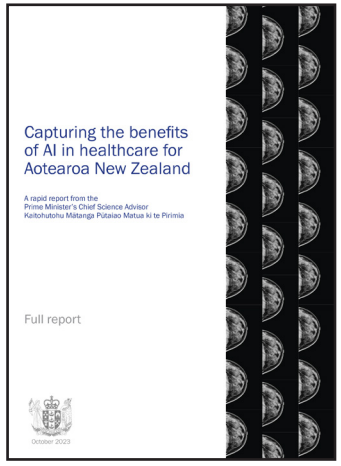
3 mbie.govt.nz/science-and-technology/science-and-innovation/research-and-data/nzris/extreme-weather-research-database

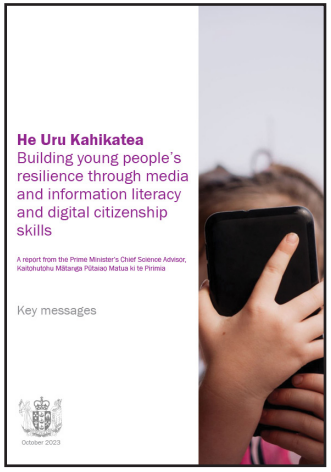
Image: Whakaari White Island after erupting on 9 December 2019. Image by Nico Fournier on a New Zealand Police reconaissance flight.

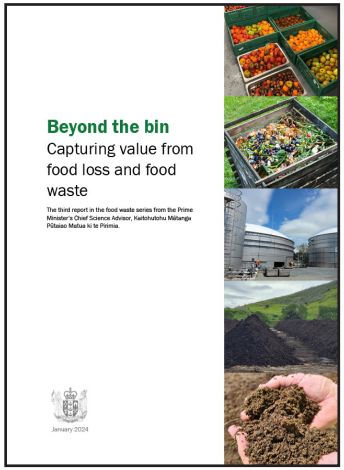
WHAT WE DO

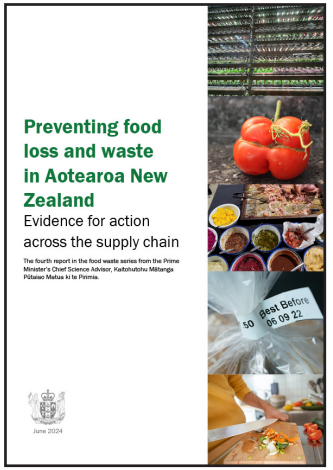
This year's reports

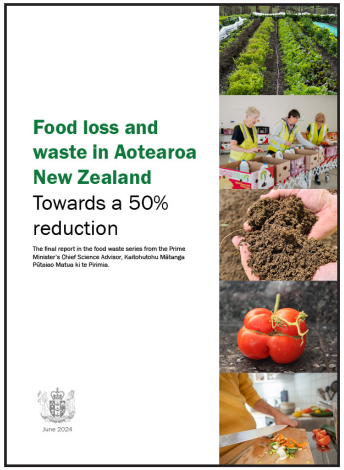
This year our focus has been on delivering three large pieces of work: AI and healthcare, food waste, and building young people's resilience to polluted information. The team has written up some of the highlights of each project. Be sure to check out our website if you would like to read them in full.











To read our reports, visit

pmcsa.ac.nz/what-we-do/publications/

WHAT WE DO

AI and healthcare

The potential to transform an industry and put more humanity into the health system.

In 2023, PM Hipkins requested that our office produce a report on AI, with an initial focus on healthcare delivery. Our team worked closely with Professor Ian Town (CSA, MoH), who co-chaired our expert panel.

For this project, we assembled a panel whose experiences spanned healthcare, academia, technology development, ethics, philosophy, tikanga Māori and governance. Their contribution to the project provided our team with the necessary guidance to complete the work in a relatively short timeframe, with draft recommendations delivered ahead of the 2023 election. This work was also supported by our wider reference group consisting of over 100 individuals from a wide range of backgrounds. We are grateful to all for their valuable contributions to our mahi!

Image: AI panel discussion.

AI is not a new technology; however, the emergence of easily accessible AI tools, such as ChatGPT, has generated excitement amongst the general public with various commentators speculating about how it might shape our societies now and into the future. It is likely that every sector will be impacted by its implementation into our social fabric, which necessitates a firm understanding of the opportunities that AI presents, and the associated risks that will require management.

The healthcare sector is under immense pressure both globally and locally. AI tools have the potential to enhance system efficiency, allowing people to receive improved quality of care. Beyond service provision, AI could also enhance research capabilities and support decision makers with the allocation of resources to the appropriate settings. Realising these benefits in our New Zealand healthcare system will require a clear vision for our healthcare system, strong coordination across

From left to right: Leigh Donoghue, Di Sarfati, and Ian Town at the AI in Healthcare Workshop and Symposium in Wellington.

public and private sectors, and effective international relationships.

Throughout the project process, we were privileged to meet with stakeholders from national and international settings who emphasised that realising the benefits of AI will depend not just on the technologies but on the wider ecosystem in which they will be implemented. Factors such as governance frameworks, deployment pathways, regulatory settings, and evaluation are all necessary to consider as we attempt to move the healthcare system forward. Of course, there will need to be consideration given to our New Zealand specific context: ensuring that we are deploying the right tools to address our healthcare needs; upholding our obligations under Te Tiriti o Waitangi; and deploying tools that will alleviate some of the pressures we face in our national healthcare system, are just some of the important factors with which our decision-makers will need to grapple. We hope that this report provides a useful evidence base to support some of those important conversations.

The report was officially published on our website in December, and the MoH had the opportunity to socialise the report at a workshop and symposium in April. The event was attended by our expert panel, representatives from various government ministries, research institutions, and businesses. AI company Soul Machines kindly generated an AI avatar that was able to give a short summary presentation about our report, followed by an interactive Q&A session. A summary report of the workshop is available online.[1]

Read more about our work on AI in healthcare:

pmcsa.ac.nz/artificial-intelligence-2/ai-in-healthcare/

Above: Dr Jade, a Soul Machines AI digital avatar, presenting the themes of the recommendations in AI in Healthcare report.

"Realising these benefits in our New Zealand healthcare system will require a clear vision for our healthcare system, strong coordination across public and private sectors, and effective international relationships."

1 bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2024/04/AI-in-Healthcare-Workshop-11-Apr-24-Summary_finalV1-3649f3bcda6b64d0.pdf

WHAT WE DO

Food waste

Envisioning a system with less waste and more utilisation.

Our third food waste report was released in February 2024 with a focus on how to add value to food waste. A fourth report on prevention and a summary report complete the series. The food waste series provides interested readers with a systematic overview of food waste throughout the food ecosystem, insight into the important mahi occurring in the food waste space, and a vision for what could happen in the future.

This food waste series has highlighted the sheer number of people, organisations and businesses that are working in the food waste space across the food system. Our reference group of almost 500 has continued to grow with members graciously sharing their insights. We hope the case studies captured in the reports provide readers with a sense of the fantastic mahi that is already underway.

We have seen various examples of initiatives geared towards mobilising large scale food waste reduction. One example is the voluntary Kai Commitment which supports its signatories to develop food waste action plans for the reduction of food waste and related emissions. Large industry players including Woolworths NZ, Fonterra, Silver Fern farms, Foodstuffs NZ, Nestlé, Wilcox, and Goodman Fielder have all signed up to the initiative so far. Other examples of large scale initiatives include the introduction of food waste collections by some councils, and the extension of funding for the Aotearoa Food Rescue Alliance enabling ongoing support and coordination across the food rescue ecosystem.

The third food waste report focused on capturing the value of food that would otherwise be wasted. There are two broad areas explored - adding value to edible food waste, and capturing value from inedible food. An example of adding value to

Image: Rebecca visiting the Greengrower fruit and vegetable processing centre in Hamilton.

edible food waste includes upcycling by-products or close-to-expiry food; many companies are producing quality products for market. Capturing value from inedible food waste considers how we can utilise the 'good stuff' for further use. For example, by creating compost or digestate. The report ultimately seeks to showcase the options we have when food waste occurs, ensuring that food waste is used in the most efficient and beneficial way possible.

The fourth report in the series acts as an important bookend looking across the food system to identify opportunities for food waste prevention. The potential for food waste prevention exists in a range of contexts: some food waste could be prevented at farms; cosmetic standards could be adjusted to allow greater volumes of edible food to reach supermarket shelves; and best-before dates could be used less. The ideal outcome for any of these interventions is to ensure that food waste isn't produced in the first place.

In parallel with the fourth report, our team produced a summary report to capture key messages and themes across the food waste series. We are delighted to note that some of the recommendations from our earlier reports are already being worked on and we are hopeful that the series of food waste reports provides a useful evidence base to support policy writers and decision makers moving to effect change.

Read more about our work on food waste here:

pmcsa.ac.nz/topics/food-rescue-food-waste/

Image: George in action at the Claris Sports and Social Club.

WHAT WE DO

He Uru Kahikatea: Building young people's resilience

Equipping young people for the digital age.

The online environment is becoming increasingly complex. For young people, a large proportion of schoolwork and social time is spent online, and many will likely grow to spend much of their adult working lives online. It is reasonable to assume that the online environment will continue to heavily influence what our young people see and experience.

The online environment enables us to access large swathes of information, some of better quality than others. While we find many legitimate sources of information in the online environment, we must also be aware of 'polluted information', a catch-all term used to describe inaccurate and misleading information. The sheer volume of polluted information can make it difficult to distinguish between sources of information that are credible and those that are not. Technological advances, coupled with easier access to newly developed tools such as AI, means that polluted information can propagate more easily across the online environment. Our young people may not have the tools necessary to critically engage with information appropriately.

Media and information literacy and digital citizenship are core parts of equipping young people to navigate this increasingly complex environment safely. Professor Stuart McNaughton (CSA, Ministry of Education) and Professor Melinda Webber from University of Auckland, Faculty of Education, co-authored this report with the Office. Both helped to connect the report to what is happening on the ground, here and abroad.

The report starts with a broad overview of the online environment, the technologies that shape it, and the issues that it has exacerbated. We highlight the need for young people to be better supported with the tools to navigate the complexities of the online environment. The report describes international interventions, outlining lessons we can draw for New Zealand. We conclude by providing an overview of how an education system response might address media and information literacy and digital citizenship.

Our report emphasises that there is no silver bullet to address the issue of polluted information. Instead, we propose taking a systematic approach to equipping young people. Developing the appropriate tools for our young people will be a challenge; however, the issue is an important one, perhaps more so now than it ever has been before.

Read more:

pmcsa.ac.nz/topics/building-youth-resilience-through-critical-thinking-and-digital-citizenship-skills/

WHAT WE DO

Internship and fellowship programme

Building links between science, research and policy.

The Office runs an internship and fellowship programme that invites researchers to work with our Office on projects that sit at the interface of science and policy. This year we've had the privilege of working with 20 interns and seconded fellows. We're grateful for the funding provided by Rangahau Ahumāra Kai Plant & Food Research, Riddet Institute, Te Koronga, Te Wānanga Aronui o Tāmaki Makau Rau Auckland University of Technology, and the University of Auckland. The programme wouldn't be possible without your support.

Read more about our internships and fellowships:

pmcsa.ac.nz/what-we-do/internships/

Left: Marissa Le Lec.
Middle: Nathan Hill (left) and Xanthe Smith (right).
Right: Trixie Croad (left) and Jessica O' Connor (middle).

With thanks to:

Plant & Food Research
Rangahau Ahumāra Kai

Riddet Institute
Kōkiri - Te Hā o te Kai

Te Koronga

AUT

University of Auckland
Waipapa Taumata Rau
New Zealand

Aerospace, sustainability, and the problematic narrative

Joining the Office in 2023 as part of her academic role, Dr Priyanka Dhopade sought to bridge engineering and environmental policy for New Zealand's emerging aerospace sector. Aerospace is a high-tech, high-wage sector for New Zealand and provides entry to an elite club of 11 countries with orbital launch capability. Of these, New Zealand's Rocket Lab launch facility at Māhia Peninsula is the only privately owned facility. Over the last decade, Rocket Lab's presence has catalysed the entire commercial aerospace sector, from high altitude drones to more spaceports, demonstrated by the official 2023 release of the MBIE Aerospace Strategy and National Space Policy.

"The public response has been largely positive, with a growing demand for aerospace engineering undergraduate programmes at University of Auckland and University of Canterbury," says Priyanka. Much of this has been occurring against the backdrop of global climate action, domestic emissions reduction planning, pandemic disruption, political uncertainty, and the very real consequences of extreme weather events for the New Zealand public. *"Sustainability in aerospace is used as a marketing strategy – relegated to orbital debris mitigation and removal, or developing alternate fuels for advanced aviation. These are worthy candidates for research investment, but they are not silver bullets."*

"Sustainability in aerospace is used as a marketing strategy..."

Through her fellowship, Priyanka has been communicating her team's research on understanding the tradeoffs between environmental, economic, and social benefits of aerospace activity to key Government and industry stakeholders. This included developing an evidence base for eco-design of space missions and the need for a systems thinking approach to commercial aerospace activity. Priyanka explains, *"aerospace-enabled data will be key to implementing emissions reductions and climate change adaptation measures, but without understanding the environmental tradeoffs due to more frequent launches, the value of the data is unclear. Issues of data trading, storage or accessibility are even less understood."*

The desire from key aerospace stakeholders to minimise sustainability considerations and deflect any narrative that could jeopardise the growth of this exciting sector has been apparent. Priyanka argues that this is short-sighted. In the long-term, social license and our aerospace narrative in New Zealand is subject to its shifting demographics, such as younger generations who will have grown up with the climate crisis. Any innovation pipeline that is envisioned to generate public excitement about the aerospace sector may need to emphasise the long-term benefits of the activity rather than the inherent achievement of the activity. The Government is being urged by industry to maintain a long-term plan for business development, but Priyanka argues that this should also involve actively shaping the public aerospace narrative through politics, entertainment, and University training programmes. *"And yes, this includes being honest about environmental, social,and legal tradeoffs."*

Building the connections between policymakers and researchers

Many of the activities over the last six years sought to build connections between policymakers and researchers. In 2021, a paper by the Office's Fellow, Dr Cate Roy, *Enhancing knowledge sharing between academics and policymakers in Aotearoa, New Zealand* described work from her fellowship with the Office, previously highlighted in Mahi Tahi 4.[1] Our intern Dr Hannah McKerchar drew on the paper's findings to develop resources intended to help researchers learn more about navigating the policy interface. These resources are available on our website,[2] including a policy brief template and animated guides. Interest in the resources was helped by Hannah's prize-winning poster presentation at the Australian Research Managers Society (ARMS) meeting in Sydney with funding for her attendance provided by the Riddet Institute.

Hannah then organised a series of interactive workshops in late 2023 and early 2024 aimed at early and mid-career researchers, research managers, and policymakers keen to build connections. The intent of the workshops was to provide attendees with insights into the power of relationships in evidence-based policy, how relationships are crafted, and how they are maintained when potential hurdles emerge. Cate Roy's work indicated that there was an *"overwhelming appetite on both sides"* to bridge the gap between research and policy. This proved correct, with registrations filling quickly and attendees travelling from all over the country to attend.

CSAs and Departmental Science Advisors from various agencies shared their experiences building the science base in New Zealand. Case studies were discussed, with relevant researchers and policy makers present, demonstrating the significance of building relationships and the importance of learning to work through tensions that arise.

Thanks to the sponsor, ARMS, attendees had the opportunity to 'speed-network' with panellists and speakers over drinks and nibbles in a semi-structured social setting. Hannah explains, *"Many attendees and panellists returned with new contacts and connections, with some staying on after the workshop's end. Feedback from the workshops was overwhelmingly positive, with calls for more networking sessions, more locations, more themed-based workshops and more cooperative projects."*

Image: Miranda Mirosa speaking at the Dunedin workshop.

1 cpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2022/07/Mahi-Tahi-4-Online-update-.pdf

2 pmcsa.ac.nz/who-we-are/our-interns/connecting-researchers-and-policymakers

Modern biotechnology

Benefits and risks for Aotearoa New Zealand.

The shape of a plant, the way in which it grows, directly impacts its survival and productivity. Each plant's DNA encodes the instructions that produce the typical form we see – whether they are petunia, maize, or Kauri. In crop plants, one of the major steps in domestication is finding plants that are a suitable size and shape such that they can be effectively grown in managed farm systems. Over the last 50 years researchers have been identifying the genes that control the way plants grow.

Since the discovery of DNA as the repository of genetic information, humankind has sought to investigate and manipulate this fundamental part of biology. Very early in this process it was realised that if DNA encoded the basic information that produced life on Earth then great care should be taken when experimenting on and with it. First the scientific community, and then governments, developed policies to control the sorts of experiments that should be performed and products that should be released. This was followed by legislation and regulation. Different countries took very different approaches in their legislation, and some were more restrictive than others.

Dr Revel Drummond undertook a fellowship with the Office with a particular interest in Aotearoa finding a way to move from its very restrictive legislation (the HSNO Act, 1996) to an evidence-based and risk-proportionate set of regulations that would enable the benefits of biotechnology to be delivered to New Zealanders. His fellowship allowed him to dedicate research time and develop connections with researchers, industry bodies and regulators in countries that have used genetic modification in their agricultural systems for many years (Australia, Canada, USA) and those currently re-examining their regulations (UK, EU, Norway).

Shortly after beginning his fellowship the National Party announced its 'Harnessing Biotech' policy in their election manifesto. The policy refers to an earlier briefing on gene editing produced by OPMCSA.[1] With their election to government, this policy is being used to drive an examination of biotechnology legislation in New Zealand.

1 https://bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/02/Briefing-on-genetic-editing-final.pdf

"This will have impacts on all aspects of biotechnology, including medicine, industrial microbiology, food and agriculture." The work Revel was able to carry out during his fellowship allowed for the provision of timely advice into both the public discussion and the policy work.

Revel suggests, *"Aotearoa would benefit from an increased use of biotechnology to address challenges such as climate change, invasive pests and to increase productivity of our agricultural sector."* However, he acknowledges that as we move forward we must develop a regulatory framework that encompasses scientific, social and cultural, economic risks, and a detailed cost benefit analysis.

"Aotearoa would benefit from an increased use of biotechnology to address challenges such as climate change, invasive pests and to increase productivity of our agricultural sector."

Creating conversation about Aotearoa's oceans

In 2020, the Office released a report titled 'The Future of Commercial Fishing in Aotearoa New Zealand'. The report delved into New Zealand's commercial marine environments and provided recommendations for how these spaces can adapt to the changing state of today's ocean.

From sedimentation to acidification, marine issues are interconnected and difficult to unpick and discuss on paper. The report provided scientific advice and innovative case studies. Xanthe Smith's intern project aimed to broaden the report's impact by translating its objectives into a podcast, aiming to add some verve and excitement.

The podcast explored new ideas that New Zealanders are applying in the marine space: these ranged from tackling fish food waste through community projects to new net designs that prevent bycatch and methods for getting more people involved in citizen science. Sharing science through a spoken medium enriches stories. Rather than follow the standard sit-down interview approach, the premise for this podcast project was to interview people on their grounds, *"where they could feel comfortable or even energised to share their work."*

Sound within this podcast is used to bring listeners into environments where innovation is underway, and allow them to hear the clamour of docks where new nets are being rigged, or feel they are standing in a town centre as fish frames are sorted through and gifted. The clear audio explanations within the podcast aim to cut through jargon and carry the content of the original report to an audience unreached by a written format.

"One of the privileges of working with the OPMCSA is the opportunity it creates for connecting with different people," says Xanthe. *"The enthusiasm of those who agreed to speak about their ideas on the podcast is a credit to the collective aspirations amongst many who connect to the ocean through their work, recreation, and culture."* The podcast reflects the intention of the original report: to encourage innovation and inspire transformation within Aotearoa's fisheries.

Image: Interns, Xanthe (left) and Nathan Hill (middle), in the Office. Here, Xanthe presented her methodology for recording and producing the podcast to the Office.

The High Seas Treaty and our future ocean

Dr Becs Jarvis on what is happening in the high seas and why it matters.

The high seas – international waters outside of any one nation – make up around two thirds of the ocean by area and 95% by volume. The future of these areas is vital for people and planet.

The high seas include a wide range of unique ecosystems and habitats, from deep-sea hydrothermal vents and seamounts that support biodiversity found nowhere else on the planet, through to the wide stretches of ocean vital for microscopic plankton, fish, and the migration routes of whales and sea turtles. Becs emphasises, *"The high seas play an important role in climate dynamics, and the rich biodiversity of these areas generates around half the oxygen we breathe. Yet our international waters are one of the most poorly managed areas on our planet."*

The high seas face a myriad of challenges such as habitat destruction, overfishing, and the expansion of deep-sea mining. Recent advances in technology mean human activities can extend further and deeper than ever before, with no part of the high seas considered to be off limits.

"...our international waters are one of the most poorly managed areas on our planet."

The high seas have always presented a complex governance and policy challenge. Previous legal frameworks have been fragmented and unable to respond to rapid changes in science and technology. However, this is set to change. In 2023, more than 80 nations – including Aotearoa – signed a new United Nations (UN) High Seas Treaty for the *"conservation and sustainable use of areas beyond national jurisdiction"*. But this does not mean the Treaty is operational yet. Signing the Treaty demonstrates a commitment to future ratification. This ratification process happens nationally, where governments need to ensure their own domestic laws and policies will align with the Treaty. Once the Treaty is ratified by 60 countries it will become international law.

On an international level, different nations are still negotiating how the terms 'conservation' and 'sustainable use' will be defined and interpreted – what indicators will be used, how will they be measured, and how will the Treaty be enforced? What processes will be put in place where nations and organisations may interpret the definitions of conservation and sustainable use differently? Who is likely to benefit the most from the Treaty, and who risks bearing any potential costs?

Becs explains that the Treaty not only impacts the future of the high seas, *"but it will also affect us here in Aotearoa."* The impacts of human activities

in international waters and the movement of marine species do not stop at the border. Signing the Treaty has also committed us to changing our own laws and policies to align with the Treaty text, and it is important that this will be done in a way that honours Te Tiriti and is supported by the best available evidence. *"As a nation deeply connected to the moana, we need to understand how the Treaty will impact the high seas and our marine spaces closer to home."*

"Signing the Treaty has also committed us to changing our own laws and policies to align with the Treaty text..."

"As a nation deeply connected to the moana, we need to understand how the Treaty will impact the high seas and our marine spaces closer to home."

Image: Becs presenting her work on The High Seas to the team.

Combatting food waste

From research to policy.

Our interns, Trixie Croad and Jessica O'Connor joined our team working on the food waste report series. Trixie previously completed her Master of Arts at the University of Otago , studying systemic drivers to food waste in the New Zealand kiwifruit industry. Jessica has taken a sabbatical from her AgResearch funded PhD research at the University of Otago (Towards a circular bioeconomy. Food loss, waste, and opportunities in New Zealand beef and dairy production) to carry out her internship with us.

Our interns' expertise in the subject were a welcome addition to the team as we completed the final two reports of the food waste series. *"It has been so exciting to see some real momentum build in the food waste world over the past few years – in part, as a result of this project,"* says Trixie *"and even more exciting to get to be a part of telling the story."* Jessica reflected, *"I believe that addressing food loss and waste has so many big opportunities to make meaningful and positive impacts for all of us, and it has been an amazing privilege to contribute to this project."*

While we know a significant amount about food waste in households in Aotearoa and globally, much less is understood about what happens further up the supply chain during food production. In New Zealand in particular, where we have such a large export-oriented food production sector, this is a significant knowledge gap. With this project, and the recently established Kai Commitment (an agreement among major food businesses to reduce food waste), as well as other activities, there is a real opportunity for New Zealand to utilise this momentum and make systemic changes that will address food waste, but also create all around more sustainable and resilient food systems in Aotearoa.

"It has been so exciting to see some real momentum build in the food waste world over the past few years – in part, as a result of this project..."

Left: Trixie Croad.
Right: Jessica O'Connor.

Investigating mission-led science communication and engagement

The National Science Challenges were the flagships of mission-led science within Aotearoa New Zealand. As the Challenges were coming to an end, a group of science communicators and engagement specialists came together to capture the lessons learned. Ceridwyn Roberts, OPMCSA Fellow, aims to take a wider perspective, encompassing mission-led science across the current New Zealand science system.

Traditionally, science communication is seen as translation that explains science to non-scientists, e.g. through media articles, videos, or websites. The mission-led element of science communication and engagement, however, requires multi-directional translation between researchers in different institutions and disciplines, as well as between a variety of audiences and researchers.

"This kind of multi-directional translation work for a project encompassing many organisations does not fit easily within the remit of an institution's communications staff, who are almost overwhelmingly incentivised to promote only their own institution's research."

Ceridwyn aims to report on how mission-led science communication and engagement can be better enabled to improve science impact in all its different guises. In compiling this report and the case studies illustrating elements of mission-led science communication and engagement, Ceridwyn interviewed directors and communications and engagement staff across the National Science Challenges, Centres of Research Excellence, Endeavour Projects, and other mission-led, science focused organisations and programmes in Aotearoa New Zealand.

Her report defines six distinct areas of impact for mission-led science communication and engagement: building social license; growing community for applied research; informed decision-making; behavioural change; economic growth; and capability building.

Each of these impact outputs require specific and specialised communications and engagement skills. The first four impact areas build upon each other. *"Without social license it is difficult to make connections with any specified community, without trust built through relationships it is difficult to create a platform for informed decision-making, which will then create behavioural change."*

Ceridwyn is also compiling a resource for researchers in search of funding, which will help encourage mission-led science communication and engagement for impact across the life of a multi-institution, multi-disciplinary project, or programme.

Out and about in Aotearoa New Zealand

Juliet and the team attempt to get out and about as often as possible, engaging with the community for various science related kaupapa. Some of these engagements are in-person while others are carried out virtually. Here are some of the highlights from the past year.

Top left: From left to right, Ben Taylor, Ian Town, Gill Jolly, and Juliet, hearing about CubeSats at The University of Auckland's Space Institute Te Pūnaha Ātea. **Top right:** Juliet opening the researchers and policymakers workshop in Auckland. **Bottom left:** Juliet and Michael Bunce at the Aotea Ecology Festival in 2023. **Bottom middle:** Juliet trying on the exoskeleton designed for overhead work at the Defence Science and Technology unit in Auckland. **Bottom right:** George and Abby Cuttriss at the AI in healthcare workshop in Wellington.

Top left: Juliet at the New Zealand Institute of Food Science & Technology conference in Dunedin. **Top right:** Gill Jolly and Susie at the Pacific Scientists get together. **Bottom left:** Carolle and Priyanka Dhopade at the National Space Research Workshop. **Bottom middle:** Susie in the Chatham Islands for the Chatham Islands Festival of Science. **Bottom right:** Michael Frawley (left), Juliet, and Pita Turei (right) at the opening of Te Puawānanga Science and Technology Centre.

Image: Aurora Australis over Aotea Great Barrier Island on 11 May 2024.

International engagements

Over the last year, the team has been fortunate to travel, present our work, and learn from colleagues in other countries. Here's a snapshot of where we have been and what we have been up to.

Top left: Professor Dame Angela McClean, UK Government CSA, and Juliet sharing challenges and opportunities, London. **Top middle:** Juliet and Signe Ratso, Deputy Director-General at EU Directorate-General for Research and Innovation, Brussels. **Top right:** Susie and the Forum of Australian Chief Science Advisors, Canberra. **Bottom left:** The Mo'ai of Rapa Nui at the close of the Rapa Nui Pacific Leaders' Summit 2024 on marine ocean plastics. **Right:** Rebecca and Pouroto Ngaropo at the International AI in Medicine Conference 2023, Singapore.

Reflecting on two terms

The team have generated various evidence syntheses to support policy writers and decision makers over the last six years, alongside briefing notes to communicate key bits of research to the PM or other relevant minsters. As well as these major pieces of work, the team provided the public with useful information about relevant national discussions as web resources on its Hot Topics page. A summary of the reports and briefings produced over the past two terms, and some relevant outcomes, are captured in table 1.

For a flavour of the media coverage of our work see:

pmcsa.ac.nz/news/in-the-media/

Left: The *Rethinking plastics in Aotearoa New Zealand* panel of experts.
Middle: The *Legalising cannabis: What does the evidence say?* panel of experts.
Top right: *The future of commercial fishing in Aotearoa New Zealand* panel of experts.
Bottom right: The *Capturing the benefits of AI in healthcare in Aotearoa New Zealand* panel of experts.

Did we make any difference? Charting the journey from evidence to policy

Six years has been long enough to see whether the reports we did early on have made any difference. The following reflection is an edited version of our blog post first published in 2022, *'Does science advice make any difference, and how does it get implemented?'* We take a look at some of the work we did in the first few years, and examine its impact.

The Rethinking plastics report

Our first major project commissioned by the PM was a detailed evidence synthesis with recommendations: *Rethinking plastics*. This work engaged a very large number of researchers and stakeholders from the outset, and it was clear that there was social license to act to address the harmful effects of plastic pollution, and a willingness to do so from all the key players.

We were just ahead of the policy agenda, meaning that there was a thirst for evidence, and while our work was independent of ministry officials, it was not isolated from them – we kept in steady contact and relayed the evidence as it accumulated. The PM encouraged our expert panel to make specific, evidence-informed recommendations and the relationships we had built within the Ministry for the Environment (MfE) made it easier for officials to advise on our report soon after we delivered it, with some immediate policy announcements at the report launch.[1] The MfE issued a formal response to the report eight months later, which agreed with, or agreed to investigate, all 51 recommendations. A decision to implement the recommendations was included in Dame Patsy Reddy's Speech from the Throne in 2020.[2]

"...while our work was independent of ministry officials, it was not isolated from them – we kept in steady contact and relayed the evidence as it accumulated. "

1 www.facebook.com/jacindaardern/posts/one-of-the-things-that-comes-through-in-letters-i-get-almost-more-than-anything-/10156453443472441/

2 stuff.co.nz/national/politics/300168172/covid19-housing-and-the-economy-the-2020-speech-from-the-throne-in-full

The sequence of implementation is driven by many factors beyond the science advice, which simply provides an evidence base to support officials to do their policy mahi. In particular, suitable substitutes for plastic items that are to be phased out must be available to enable a smooth transition away from plastics. Aotearoa now has a National Plastics Action Plan,[3] which maps our pathway towards "*a New Zealand where plastic use is sustainable and innovative, and where*

"A decision to implement the recommendations was included in Dame Patsy Reddy's Speech from the Throne in 2020."

3 environment.govt.nz/assets/publications/National-Plastics-Action-Plan.pdf

plastics are used in a way that protects the environment and benefits society," supporting a transition to a low-carbon circular economy.

Progress on the action plan is well underway. For example, after a public consultation in 2020, the government is in the process of phasing out hard-to-recycle plastics and some single-use plastic items; a Plastics Innovation Fund has been established to accelerate the development of solutions that minimise plastic waste and support circular solutions; and the landfill levy is being progressively increased and expanded so that it costs more to dispose of waste. This should hopefully drive alternatives to waste disposal and raise more funds to dedicate to waste minimisation and management. The work isn't done – there are a number of ongoing government workstreams that were supported by *Rethinking plastics*, which we continue to watch with interest.

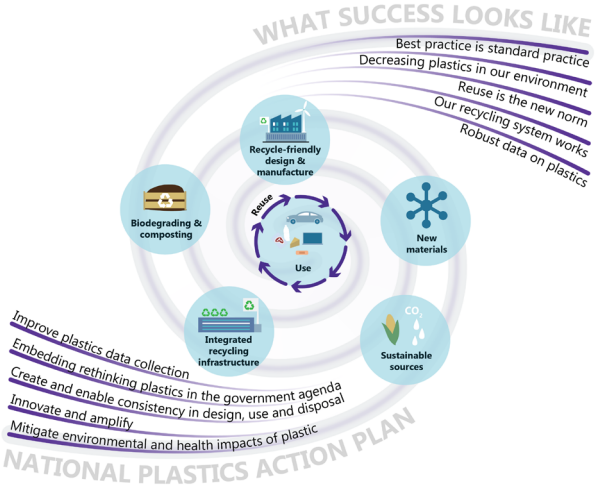


Image: Our vision for plastics.

The Commercial fishing report

Not all projects have a clear social license. Our 2020/21 project on the future of commercial fishing was commissioned by the PM, who wanted to understand better how data and science could support improved fisheries management and interrogate the sustainability of our fisheries. In contrast to the plastics project, where there was a key mandate for change, our fisheries report was a deep dive into a murky world of conflicting positions, varying stakeholder priorities, and patchy data. All this was underpinned by competing demands to use and protect our marine environments. Juliet made some reflections on these dynamics in the foreword to the report.[1]

"...our fisheries report was a deep dive into a murky world of conflicting positions, varying stakeholder priorities, and patchy data."

This project highlighted that science advice can't occur in a vacuum. It was crucial for us to understand the social and cultural aspects of fisheries management and the complexities of the regulatory system to avoid making science-based recommendations that wouldn't work in the real world. We saw that science could support change, but only if the settings were right, and there was trust amongst scientists and stakeholders – so a large part of our report focussed on the context of the commercial fishing world, uncovering the challenges and opportunities, ahead of putting forward some science-based solutions. A great deal of energy was expended on stakeholder engagement, to socialise the report before submission and many hours were invested wordsmithing the report and the recommendations to provide enough nuance to satisfy our many robust peer reviewers. We were relieved by the relatively warm reception of the final recommendations and the steady media commentary that the report has attracted since its release.

Image: Hoki (Macruronus novaezelandiae).
Image credit: Rebekah Parsons-King/NIWA.

"A great deal of energy was expended on stakeholder engagement, to socialise the report before submission..."

1 bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/01/Fish-report-Full-report-11March21.pdf

Learning from our success with the rethinking plastics project, we worked hard to socialise our recommendations with officials rather than surprise them on publication. We were delighted when one of the expert panel recommendations, to create a Ministerial portfolio in Oceans and Fisheries, was actioned ahead of the report being released. The rest took some time, with a cabinet paper[1] ahead of the official response to the report in August of 2022.[2] When the official response was released, the Minister for Oceans and Fisheries noted that "the report has already been influential in shaping this Government's approach to oceans and fisheries management." The report was also was cited in the Fisheries Industry Transformation Plan.[3] To quote the Executive Summary: "*The plan draws on insights from the report by the Prime Minister's Chief Science Advisor on The Future of Commercial Fishing in Aotearoa New Zealand. The actions relating to innovation, use of data and creating additional value through new products build upon opportunities highlighted in the report*." It was rewarding to see the current government maintain the Ministerial portfolio of a combined Minister of Oceans and Fisheries and we await developments in the Fisheries space with interest.

Image: Juvenile paua.
Image credit: David Allen/NIWA.

1 mpi.govt.nz/dmsdocument/52630-Government-Response-to-the-Future-of-Commercial-Fishing-report-Cabinet-paper
2 mpi.govt.nz/dmsdocument/52624-The-Future-of-Commercial-Fishing-in-Aotearoa-New-Zealand-Government-response
3 seafood.co.nz/industry-transformation

...the Minister for Oceans and Fisheries noted that "the report has already been influential in shaping this Government's approach to oceans and fisheries management."

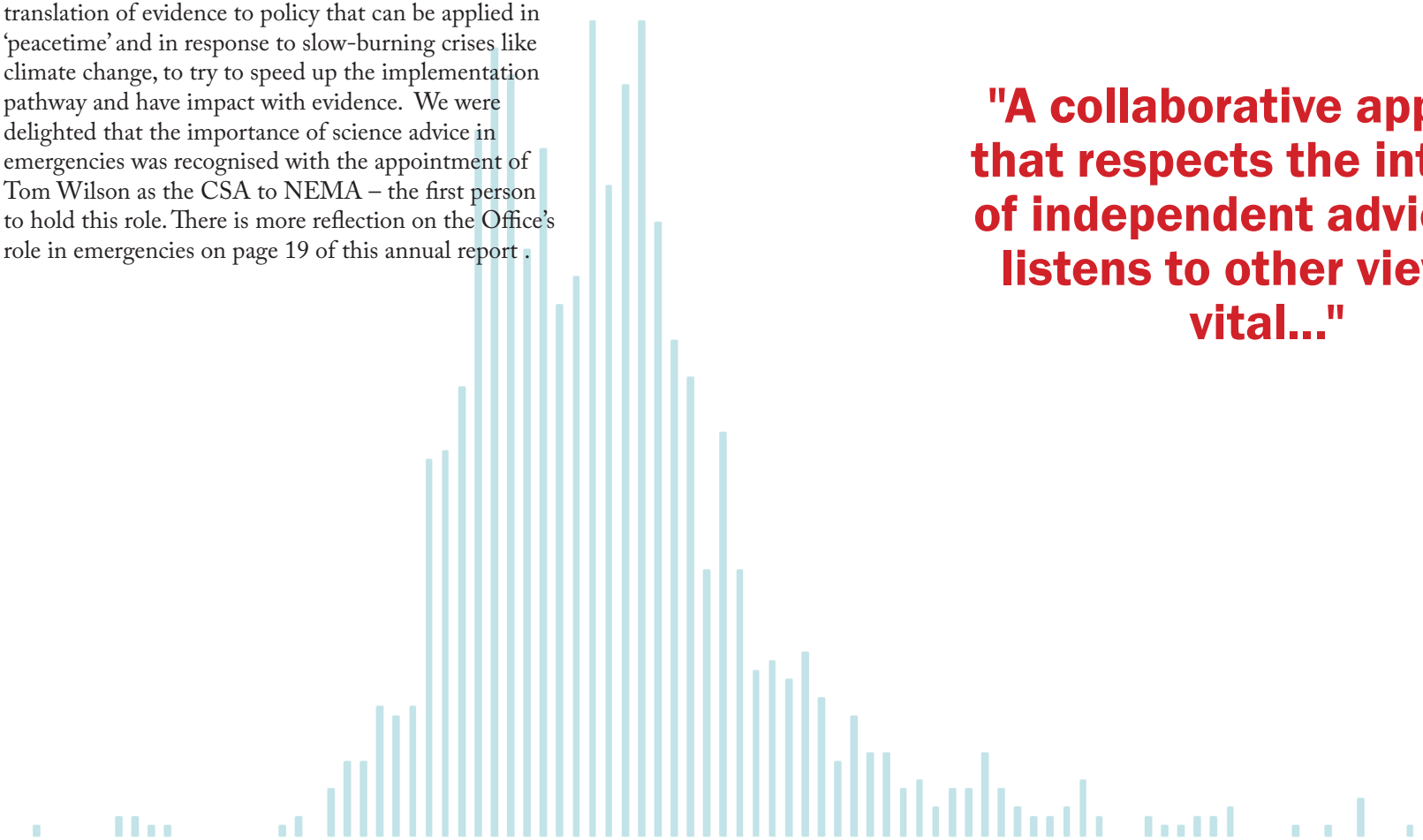
Things speed up in emergencies, but the RITA principles remain

Throughout our two terms in the Office, we adhered to four principles to guide our work: Rigour, Inclusivity, Transparency and Accessibility (RITA). Things were very different during emergencies, when the pathway from science advice to action is necessarily faster than our methodical expert panel processes, but the RITA principles served as a useful check to guide our practice. We saw this in the response to the Whakaari eruption and the COVID-19 pandemic, both of which you can learn about on our webpage. In particular, check out the short independent documentaries that Shirley Horrocks made on the role of science in emergencies, and contrast them to the ones she made on plastics and fishing.[4]

Image: Shirley Horrocks documentary poster.

4 youtube.com/channel/UCHOwn-xdgb2AuaaMI71s2pg

In emergencies, it is even more critical to share information with all decision makers, not just the PM, to ensure that evidence is available to feed in at multiple stages in the response and across different parts of government. A collaborative approach that respects the integrity of independent advice but listens to other views is vital, and providing the information on the requested timeframe to influence policy is essential. We also continued to reflect on what we learned from each crisis response, drawing lessons about effective translation of evidence to policy that can be applied in 'peacetime' and in response to slow-burning crises like climate change, to try to speed up the implementation pathway and have impact with evidence. We were delighted that the importance of science advice in emergencies was recognised with the appointment of Tom Wilson as the CSA to NEMA – the first person to hold this role. There is more reflection on the Office's role in emergencies on page 19 of this annual report .

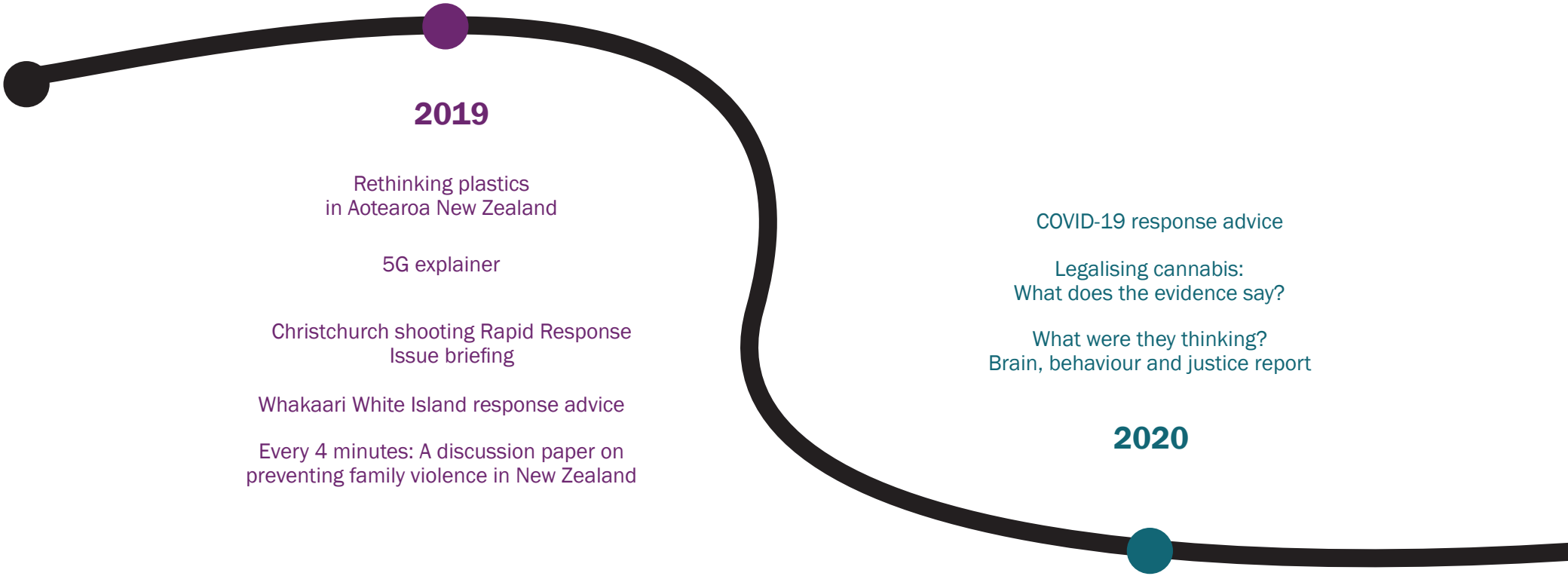


"A collaborative approach that respects the integrity of independent advice but listens to other views is vital..."

WHAT WE DID

A recap of the works produced by the Office

The team has generated various works over the past two terms including evidence syntheses to support policy writers and decision makers, briefing notes to communicate key bits of research to the PM or other relevant minsters, and web resources to provide the public with useful information about relevant national discussions. A summary of the reports and briefings produced over the past two terms, and relevant corresponding outcomes are captured in table 1.



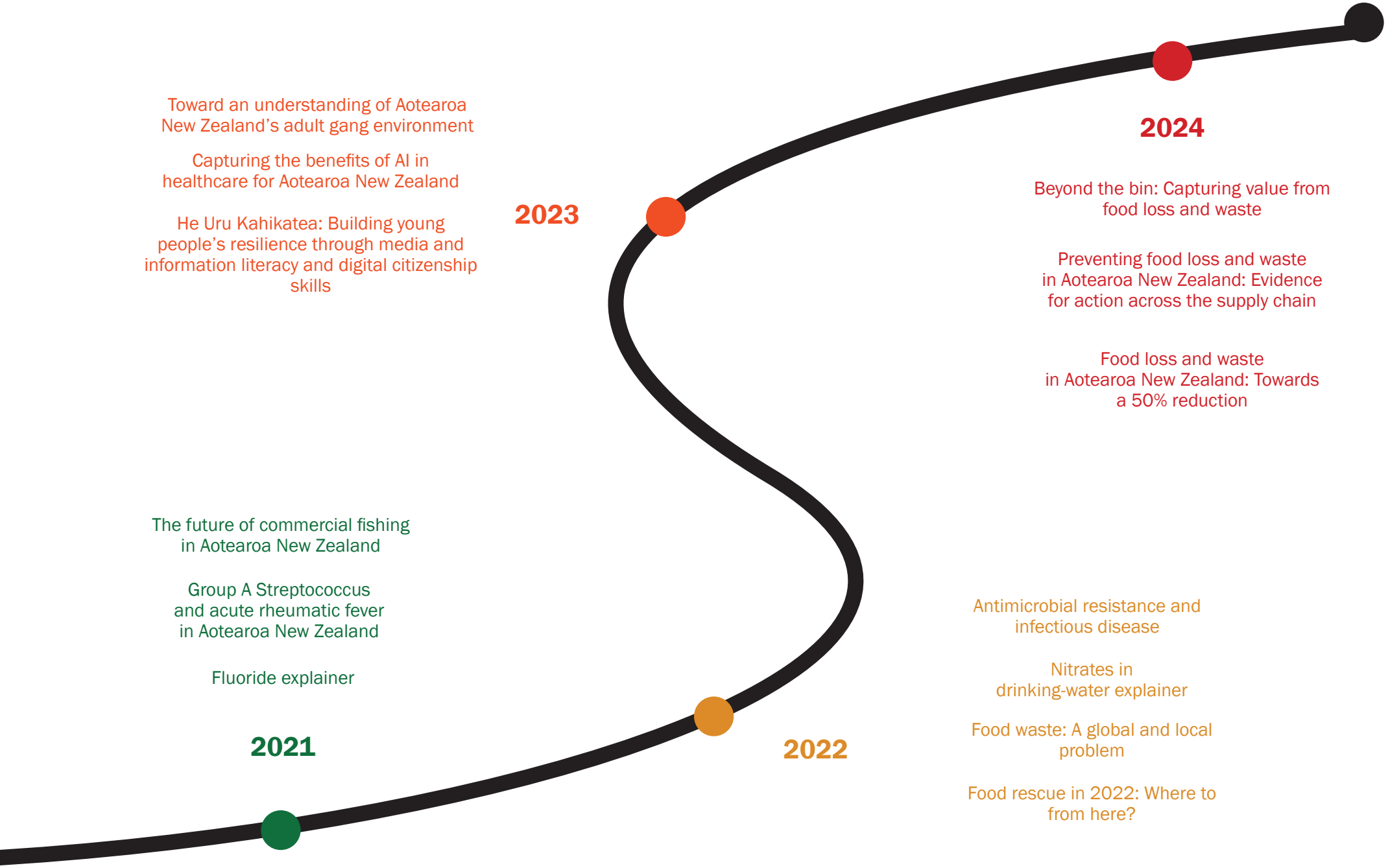

2024
Beyond the bin: Capturing value from food loss and waste
Preventing food loss and waste in Aotearoa New Zealand: Evidence for action across the supply chain
Food loss and waste in Aotearoa New Zealand: Towards a 50% reduction
2023
Toward an understanding of Aotearoa New Zealand's adult gang environment
Capturing the benefits of AI in healthcare for Aotearoa New Zealand
He Uru Kahikatea: Building young people's resilience through media and information literacy and digital citizenship skills
2022
Antimicrobial resistance and infectious disease
Nitrates in drinking-water explainer
Food waste: A global and local problem
Food rescue in 2022: Where to from here?
2021
The future of commercial fishing in Aotearoa New Zealand
Group A Streptococcus and acute rheumatic fever in Aotearoa New Zealand
Fluoride explainer

Table 1: Reports and resources produced by the Office over the last two terms.

2018		
Title	**Output**	**Outcomes**
Website	Refreshed OPMCSA website, building a resource for those interested in scientific evidence: pmcsa.ac.nz.[1]	The website has been built steadily over the six years and is widely cited in the media. It also enabled us to quickly point interested parties to an evidence base on hot topics.
Antimicrobial resistance[2]	A short briefing to PM Ardern alerting her to the threat of antimicrobial resistance and infectious diseases more widely.[3]	The briefing was a precursor to the commissioned detailed report on this topic in 2021 (see page 50).
2019		
Rethinking plastics in Aotea-roa New Zealand[4]	This was a detailed evidence synthesis with recommendations (see page 43).	Almost all recommendations have been accepted with some already implemented (see page 43). The report has also attracted international attention with Juliet presenting the findings at the invitation of MFAT at the ASEAN-Pacific summit in Indonesia and the Pacific Leaders' Summit on Marine Ocean Plastics in Rapa Nui.[5]
5G in Aotearoa New Zealand[6]	An evidence synthesis to inform the general public, coinciding with the roll out of 5G in Aotearoa New Zealand.	The synthesis was widely referenced by the media and attracted interest from local councils and stakeholders.
Briefing to the PM on the Report on Gene Editing from the Royal Society Te Apārangi[7]	This concise briefing on gene editing was prepared for the PM based on the comprehensive report on gene editing by The Royal Society Te Apārangi.	The briefing supported moving the conversation on this contentious topic forward within the Beehive. Minister Parker asked officials for advice, and widespread consultation was undertaken on work in containment and for medical applications. Most recently, this briefing has been referenced in the National Party policy, *'Harnessing Biotech'*.[8]
Briefing on NZ Journal of Psychology Rapid Response Issue dedicated to reflections on the immediate aftermath of the Christchurch shooting	A briefing prepared at pace for the PM by Juliet, Marc Wilson (Journal Editor of the New Zealand Psychology Journal), Ian Lambie (CSA, Justice) and Stuart McNaughton (CSA, Education).	This briefing informed the PM ahead of the formation of the Christchurch Call.

1 pmcsa.ac.nz/
2 pmcsa.ac.nz/topics/antimicrobial-resistance-and-infectious-disease/
3 dpmc.govt.nz/sites/default/files/2022-04/PMCSA-18-01_Antimicrobial-resistance-Web-Version-2-1jpgqch.pdf
4 pmcsa.ac.nz/topics/rethinking-plastics/
5 sprep.org/news/sprep-spotlights-pacifics-commitment-to-plastics-treaty-at-rapa-nui-pacific-leaders-summit
6 pmcsa.ac.nz/topics/5g-in-aotearoa-new-zealand/
7 pmcsa.ac.nz/topics/gene-editing/
8 national.org.nz/harnessingbiotech

Title	Output	Outcomes
External review of unsettled or new science in standards development projects[1]	A briefing requested by the Minister of Commerce and Consumer Affairs, in the wake of Sir Peter Gluckman's 'Meth report'. We worked jointly with MBIE on how science is treated in the NZ standards setting process, and how this could be improved.	The briefing streamlined the process for scientific evidence into standards which includes the CSA for MBIE.
2019-2020		
COVID-19[2]	A large number of written and verbal advisory briefings provided to the PM as part of the COVID-19 pandemic.	These briefings supported the PM in decision making that saved lives.
2020		
Cannabis at a glance[3]	An evidence summary prepared to inform the public ahead of the referendum.	This summary attracted widespread media attention.
2021		
The future of commercial fishing in Aotearoa New Zealand[4]	A detailed evidence synthesis with recommendations (see page 44).	Most recommendations from this report were accepted at least in part, with some already implemented (see page 44).
Fluoridation: An update on the evidence[5]	A public facing explainer, covering the evidence surrounding addition of fluoride to water supplies to update the report produced by the Royal Society Te Apārangi in 2014.[6]	This work was used as part of the evidence base for changes to legislation on addition to fluoride in drinking water. It has been widely referenced by the media,[7] local councils[8,9] and stakeholders.
Antimicrobial resistance and infectious disease[10]	A detailed evidence synthesis with recommendations.	This report attracted international engagement from Australia and the UK. MPI reported that this evidence base will inform their antimicrobial action plan and assist in refreshing our national strategy.[11] We await a formal response from the MoH.

1 dpmc.govt.nz/sites/default/files/2022-04/PMCSA-19-01-External-review-of-unsettled-or-new-science-in-standards-development-projects-v1.pdf
2 pmcsa.ac.nz/topics/covid-19/
3 pmcsa.ac.nz/topics/cannabis/
4 pmcsa.ac.nz/topics/fish/
5 pmcsa.ac.nz/topics/fluoridation-an-update-on-evidence/
6 royalsociety.org.nz/assets/documents/Health-effects-of-water-fluoridation-Aug-2014-corrected-Jan-2015.pdf
7 scoop.co.nz/stories/GE2106/S00033/chief-science-advisor-releases-pure-propaganda.htm
8 waitaki.govt.nz/Services/Water-and-wastewater/Fluoridation-Requirement
9 horowhenua.govt.nz/News-Events/News/Levin-%C5%8Chau-water-supply-to-be-fluoridated-by-31-July-2023
10 pmcsa.ac.nz/topics/antimicrobial-resistance-and-infectious-disease/
11 mpi.govt.nz/dmsdocument/56872-News-and-views-May-2023

Title	Output	Outcomes
Group A Streptococcus and acute rheumatic fever in Aotearoa New Zealand[1]	An evidence synthesis completed alongside the Antimicrobial resistance report (above).	This report was cited as evidence in the MoH Rheumatic fever roadmap.[2] It was also used as an evidence base to support vaccine funding and vaccine development to prevent rheumatic fever.[3]
2022		
Food waste: A global and local problem[4]	The first report in our food waste series outlines why food waste is a problem, and describes what is known about this issue both locally and globally.	This report engaged stakeholders in collaborative work (e.g New Zealand Food Waste Champions 12.3).
Food rescue in 2022: Where to from here[4]	The second report in our food waste series is a detailed evidence synthesis with recommendations.	A formal response expected after the publication of the summary report (see page 25). Some of the recommendations have influenced decisions. E.g. providing tax relief for businesses donating food;[5] funding for the New Zealand Food Network, Kore Hiakai Zero Hunger Collective, and Aotearoa Food Rescue Alliance.[6]
Nitrates in drinking water[7]	A public facing explainer, covering the evidence surrounding health issues associated with nitrates in drinking water.	This explainer has been referenced by officials, media, local councils[8] and stakeholders.
Foreword; New Zealand Science Review Vol 75(4)[9]	A foreword to a special issue of the NZ Science Review coauthored with Professor Tahu Kukutai.	This foreword contributed to the conversation at the intersection of mātauranga and 'western' science.
2023		
Toward an understanding of Aotearoa New Zealand's adult gang environment[10]	The report provides an evidence synthesis of the harms done by, to, and within gang communities.	The report was referenced widely in national and international media and received a favourable mention from UNICEF.[11]

1 pmcsa.ac.nz/topics/antimicrobial-resistance-and-infectious-disease/rheumatic-fever/
2 tewhatuora.govt.nz/publications/rheumatic-fever-roadmap-2023-2028/
3 beehive.govt.nz/release/funding-vaccine-development-help-prevent-rheumatic-fever
4 pmcsa.ac.nz/topics/food-rescue-food-waste/
5 ird.govt.nz/topics/tax-relief-for-emergency-events/tax-relief-for-donations-of-trading-stock
6 msd.govt.nz/what-we-can-do/community/food-secure-communities/index.html#:~:text=Budget%202023%20provides%20%2424.8m,%2415m%20over%20two%20years
7 pmcsa.ac.nz/topics/nitrates/
8 ashburtondc.govt.nz/news/2023-news/drinking-water-on-council-supplies-compliant-with-national-standards
9 scientists.org.nz/Special-Issue
10 pmcsa.ac.nz/topics/evidence-summary-on-minimising-harm-from-and-within-gangs-in-aotearoa/
11 x.com/unicefnz/status/1682240078020751362?s=46

Title	Output	Outcomes
Building young people's resilience through media and information literacy and digital citizenship skills[1]	The report provides an evidence synthesis on how best to equip teachers with knowledge, tools for assessment, and resources, to build media and information literacy and digital citizenship.	The report was presented at The Royal Society Te Apārangi in a public lecture with Professor Julia Wright.
Capturing the benefits of AI in healthcare for Aotearoa New Zealand[2]	A detailed evidence synthesis with recommendations.	A workshop was co-hosted with the MoH in Wellington to socialize the recommendations and build relationships between our expert panel and officials. The report has attracted international attention. The vision which opened the report is being used by an OECD expert group on AI and healthcare. We await a formal response from the MoH.
2024		
Beyond the bin: Capturing value from food loss and waste[3]	Two detailed evidence syntheses with recommendations, and a summary report collating recommendations from the entire food waste series.	The final reports of the food waste series to be launched an event hosted by NZ Food Waste Champions on July 27th. Outcomes pending!
Preventing food loss and waste in Aotearoa New Zealand: Evidence from across the supply chain[14]		
Food loss and waste in Aotearoa New Zealand: Towards a 50% reduction[14]		

1 pmcsa.ac.nz/topics/building-young-peoples-resilience-through-media-and-information-literacy-and-digital-citizenship/
2 pmcsa.ac.nz/artificial-intelligence-2/ai-in-healthcare/
3 pmcsa.ac.nz/topics/food-rescue-food-waste/

Contributions from the forum

Occasionally our science advisors have published reports with support from OPMCSA. An overview of these works is summarised below in table 2.

Table 2: Work produced by members of the Forum over the last two terms.

2018			
Title	**Resource**	**Author**	**Comments**
Every 4 Minutes: A discussion paper on preventing family violence in New Zealand[1]	Report.	Ian Lambie	Used by: • family violence group at the Ministry of Justice (MoJ); • family violence clearing house; • police; • community groups; and • the judiciary.
2020			
The literacy landscape in Aotearoa New Zealand[2]	Report.	Stuart McNaughton	The report outlines possible actions across primary and secondary schooling to improve literacy.
Evidence-based psychological treatments to reduce suicide in New Zealand	Report.	Ian Lambie	A short report focused on evidence-based treatments to reduce suicide in New Zealand.
What were they thinking? A discussion paper on brain and behaviour in relation to the justice system in New Zealand[3]	Discussion paper.	Ian Lambie	Presents evidence of the over-representation of people in the criminal justice system who have had brain injuries. It has been cited in the media on numerous ocassions.[4] Used by: • the judiciary (and cited by them); • corrections and MoJ to strengthen their understanding of their work;[5] • community groups; and • researchers.[6,7,8]

1 bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/02/Every-4-minutes-A-discussion-paper-on-preventing-family-violence-in-New-Zealand.-Lambie-report-8.11.18-x43nf4.pdf
2 dpmc.govt.nz/sites/default/files/2022-04/PMCSA-20-15_The-Literacy-Landscape-in-Aotearoa-New-Zealand-Full-report-final.pdf
3 bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2020/02/What-were-they-thinking-A-discussion-paper-on-brain-and-behaviour-in-relation-to-the-justice-system-in-New-Zealand-updated.pdf
4 stuff.co.nz/national/119083454/tramatic-brain-injuries-like-teina-pora-case-common-in-criminal-justice-system--report
5 districtcourts.govt.nz/reports-publications-and-statistics/publications/norris-ward-mckinnon-speech-judge-walker-2022/
6 doi.org/10.1177/13623613211065541
7 doi.org/10.1044/2022_AJSLP-22-00086
8 doi.org/10.1017/bpp.2023.13

Title	Resource	Author	Comments
COVID-19 papers	Various.	Ian Town, Michael Bunce and PMCSA Interns	Various reports and evidence summaries prepared under urgency to support the NZ govt response to COVID-19.
2022			
How we fail children who offend and what to do about it: 'A breakdown across the whole system'	Report.	Ian Lambie, Jerome Reil, Andrew Becroft, Ruth Allen	A report describing how we fail children who offend and identifies the lack of response to child offenders in New Zealand. It offers solutions to this problem. This report was funded by a Michael and Suzanne Borrin Foundation and NZ Law foundation grant, with support from the University of Auckland. It has been cited in the media on numerous occasions.[1,2] The report is linked to Ian Lambie's work on the PMCSA website.[3] Used by: • the judiciary (and cited by them); • Oranga Tamariki (and cited by them);[4] • community groups; • iwi; • academic literature;[5] • Borrin Foundation; and • philanthropic funders.

1 nzherald.co.nz/nz/youth-crime-young-offenders-often-child-victims-of-family-violence-neglect/ZDHOAWLC2NFDRM6DKAMH3S6QEA/
2 newsroom.co.nz/2022/08/31/five-alternatives-to-tough-on-crime/
3 bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/f/688/files/2023/03/2018-45-28.Children-Who-Offend.Final-research-report-March2022.pdf
4 orangatamariki.govt.nz/about-us/research/seminars/evidence-centre-seminar-december-2022/
5 ojs.aut.ac.nz/anzjsi/article/view/87

THE PAST AND PRESENT

CSA Forum

We acknowledge that the Forum have often have split their time between their science advisory roles and other working commitments. We are grateful to members past and present for their commitment to seeing research and science harnessed effectively to inform policy advice.

pmcsa.ac.nz/who-we-are/chief-science-advisor-forum/

The OPMCSA team

The team supporting the PMCSA come from different backgrounds, each contributing their skillsets to help produce science advice.

pmcsa.ac.nz/who-we-are/our-office

Past and present

We have had some wonderful interns and fellows work alongside the Office over the past two terms. Thank you to all whose time and efforts contributed to the development of some fantastic projects!

pmcsa.ac.nz/what-we-do/internships/

Engagements throughout the years

The team have been fortunate enough to engage with some amazing communities during the past two terms. Some highlights from our domestic and international engagement are captured below!

Top left to right: Attendees at the women in science dinner, hosted by the Hon Dr Megan Woods, with special guests Professor Lisa Harvey-Smith and Professor Jenny Martin from Australia. Amazing ideas canvassed from the research community at the beginning of Juliet's first term. 2018-2019 was a record breaking kākāpō breeding season. **Image credit:** Andrew Digby/Department of Conservation. **Bottom left to right:** Juliet and the team at the Kai Commitment launch in 2022. Then PM Jacinda Ardern at the launch of the *Rethinking plastics* report in 2019. Juliet with Dr Kelvin Droegemeier (right), and Chris Liddell at the US Office of Science and Techology Policy. Australian FACS tour of Monash.

Clockwise: Juliet and Tahu Kukutai at a hui at Waipapa Marae. Juliet at Shackleton's hut during her visit to Antarctica. Juliet meets the Chief Scientist of Australia, Alan Finkel (left) along with Min Megan Woods (middle). Juliet meeting with Director Dr. Sethuraman Panchanathan and the National Science Foundation team. Juliet with the team at Waiheke Resources Trust in 2022. The team on Ōtata Island with the Neureuter family, mana whenua and Auckland Museum staff.

FINANCES

2023–2024

Budget estimates.

The activities of the Office are funded under a MOU between the University of Auckland, DPMC, and MBIE. The forecasted expenditure from this contract is included here. These are budget estimates, not financial statements. The University of Auckland continues to support the activities of the Office by providing institutional support, meeting facilities, and access to financial and administrative services. We would like to particularly acknowledge the following key individuals within the University for their support: Nikki Andrews, who keeps an eye on our finances; and Ranmali Mada in the Office of the Vice Chancellor, who provides a vital link to administrative services. We also thank the DPMC for providing hot desk facilities and general support, in particular Kirsty Flannagan, Ruth Fairhall, John Scott, Hayden Glass, and Chris O'Gorman.

	1 July 2023 – 30 June 2024*
Funding received from DPMC for operations of the Office under the MoU	795,000
Funding received from MBIE for operations of the Office under the MoU	500,000
Breakdown of MoU Funding	
Salaries/people costs	1,030,000
Research costs	120,000
Operational costs	50,000
Domestic travel, Wellington	35,000
Other domestic travel	30,000
International travel	30,000
Total expenses	**1,295,000**

Honorarium to Juliet Gerrard (this is a direct payment outside of the MoU)	25,000

*Budget estimates do not include in-kind contributions.

Kua hua te marama

Ngā mihi nui
ki a koutou katoa

Annual Report 1 July 2023 – 30 June 2024

The Office of the Prime Minister's Chief Science Advisor, Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia.
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