

Our Land and Water

Annual Report Summary



July 2021 – June 2022

10 Things Our Land and Water Learned in 2021–2022

1

The national average 'lag time' between nitrate-N leaching from agricultural land and its arrival in large rivers is predicted to be in around 5 years.

2

Trends in contaminant concentrations at over 1050 river water quality monitoring sites across New Zealand were so strongly influenced by climate that lengthy monitoring periods will be required to establish long term trends.

3

A survey of 5000 consumers in China, India, Indonesia, Japan, and the UK found that technology use is a strong predictor of online food and beverage spending in emerging economy markets.

4

Annual surface erosion caused by grazing was estimated to be up to 30 Mt/yr nationally, representing over a third of the total sediment yield.

5

Consistent and correct use of Māori place names would help reconnect tangata whenua to their land and water and support aspirations for future generations.

6

A mass balance at a dairy factory processing site showed that phosphorus was leaching to a depth of over 2m, indicating that more active effluent management is needed at such sites.

7

Catchment groups that make the best progress on improving freshwater outcomes are those that accept responsibility, set objectives, have an action plan, use a structured reporting mechanism, and have strong relationships.

8

Having a collective set of values serves to sustain successful value chains, encouraging collaboration along the chain to solve challenges.

9

The addition of synthetic nitrogen fertiliser may have little impact on soil microbiome structure or composition, but drastically reduces the microbiome network connectivity.

10

An audit tool was developed to help regional authorities and mana whenua identify opportunities to work more effectively together to implement Te Mana o te Wai, with greater transparency.

1 <https://doi.org/10.1038/s41598-021-95302-1>

2 <https://doi.org/10.1071/MF21086>

3 <https://ourlandandwater.nz/driveretal>

4 <https://doi.org/10.1016/j.envsoft.2021.105228>

5 <https://ourlandandwater.nz/ruhaetal>

6 <https://doi.org/10.1080/00288233.2022.2037091>

7 <https://ourlandandwater.nz/sinneretal>

8 <https://ourlandandwater.nz/dalzieletal>

9 <https://doi.org/10.3389/fmicb.2021.786156>

10 <https://ourlandandwater.nz/tmotw-audit-tool/>

Our objective is to maintain and improve our land and water quality for future generations, while enhancing the value of the primary sector to New Zealand.

The Our Land and Water objective holds te ao Māori (a Māori world view) at its heart as a central unifying concept, giving effect to a vision that recognises our fundamental connection to our land and water, to which we give and receive benefits in a reciprocal way.

It embraces a concept of value creation from agriculture that is much broader than growth in production or productivity. Te ao Māori is now well embedded across the Our Land and Water research portfolio, with over 50% of current research being Māori-centric or kaupapa Māori research.

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Executive Summary

The Our Land and Water National Science Challenge is working towards an agri-food and -fibre system that enhances the vitality of te Taiao, by creating mosaics of diverse land uses that improve the health of land, water and people. Our goal is for all New Zealanders to be proud of our genuinely healthy land and water, and for Aotearoa to be world-renowned for its sustainable food and fibre production.

Our Land and Water is hosted by AgResearch and supported by 16 collaborative partner research organisations.

In this financial year, Our Land and Water invested in 19 new research programmes and projects, and 12 Rural Professionals Fund special projects. This included the launch of the final major research programme for Our Land and Water, Revitalise Te Taiao (\$7.4m). The communications and engagement capacity of Our Land and Water was increased from 1.0 to 2.6FTE, to support the achievement of Our Land and Water's impact goals by facilitating the transfer of research findings and outputs to end-users and stakeholders.

Major achievements in 2021–22 include:

A new magazine, *New Ground*, was compiled to communicate the results of the inaugural round of rural professional-scientist-farmer collaborations. 15 completed projects to rapidly test novel ideas for significantly improving agri-food and fibre farming systems were featured in the magazine, which was distributed through the NZIPIM rural professionals' network, as well as Our Land and Water's usual communication channels.

The first practical guidelines for enacting and implementing Te Mana o Te Wai, as it is required by the NPS Freshwater Management (2020), were produced, featuring case study examples.

Webinar series on regenerative agriculture (5 webinars with over 480 registrants) and on the history and implications of Wai 262, Ngā Taonga Tuku Iho (3 webinars, over 900 registrants) were very well received. The regenerative agriculture webinars were timed to support the release of 20 detailed technical reports. The Wai 262 series was organized by Our Land and Water on behalf of the cross-NSC Rauika Māngai.

Notable science findings and impacts in 2021–22 include:

Determination of a national average lag time of 5.4 years between nitrogen leaching from agricultural land and its arrival in large rivers. This indicates that the government's 5-year target for the improvement of water quality is not unreasonable, but may be unachievable in approximately half of our large rivers.

In related research it was noted that climate conditions create such variability in water quality monitoring data at most of New Zealand's river monitoring sites, that lengthy monitoring records (e.g., longer than 5 years) will generally be required to establish reliable trends associated with land use change and intensity.

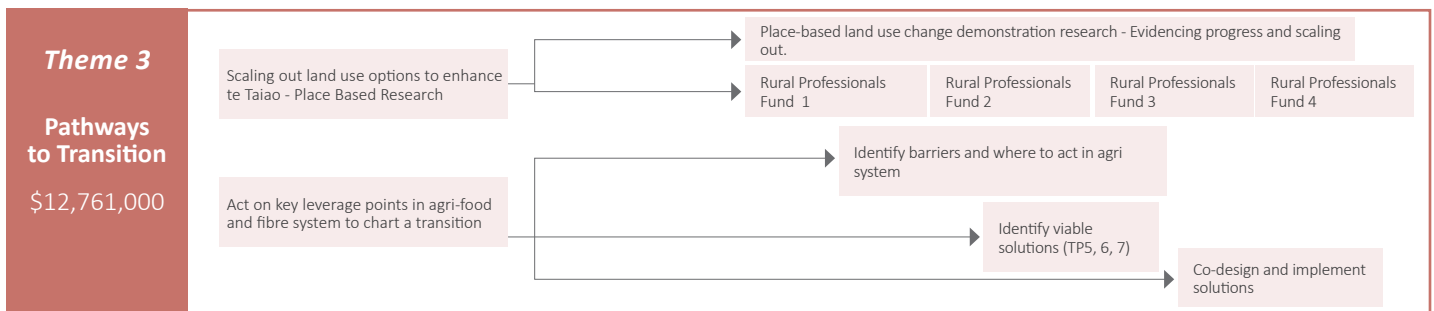
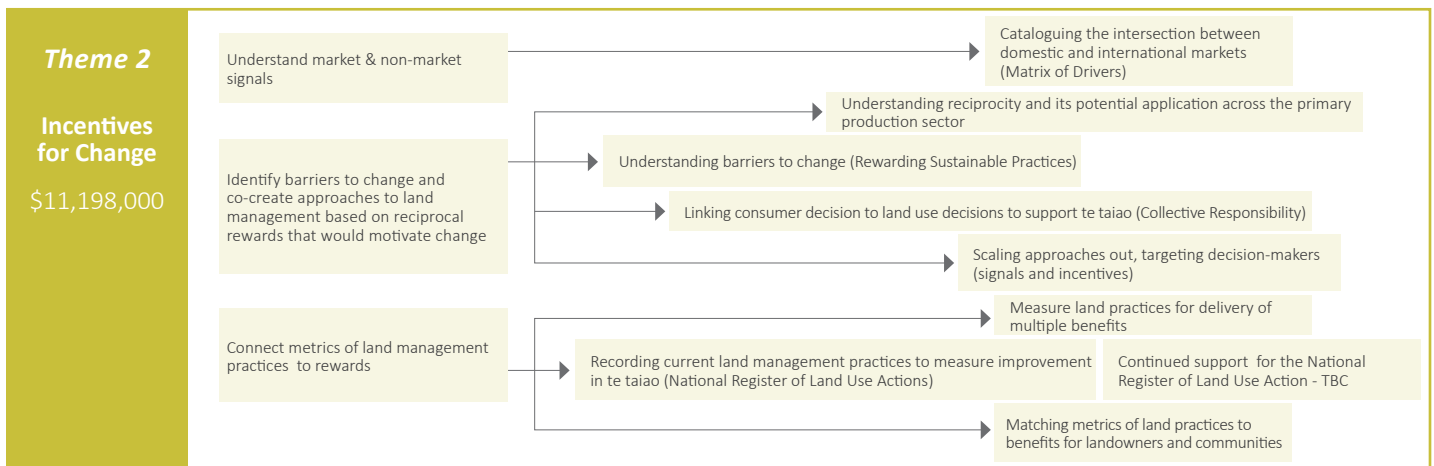
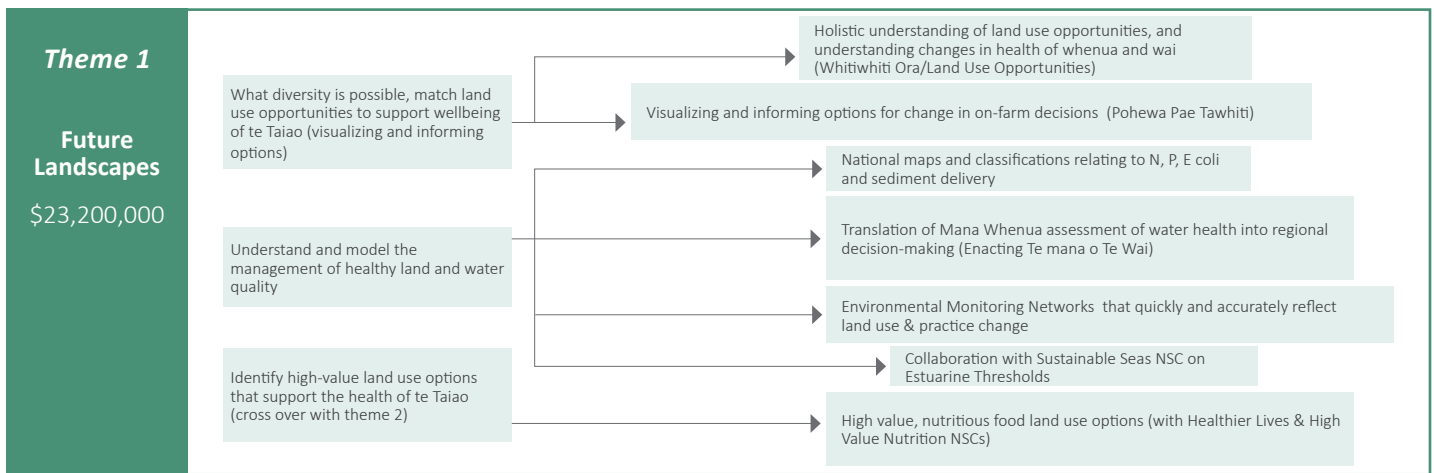
In 2022–23, Our Land and Water expects to complete its pivot to creating optimum impact from previous and current research outcomes, with few new research initiatives anticipated. A third round of the Rural Professionals Fund will be run, with a fourth and final round of projects to begin in April 2023. Residual strategic research funds will be used to support impact extension, address emergent research issues and develop stakeholder capabilities in the application of Our Land and Water tools.

Our Research Structure

Our Land and Water has been operational for six years, and the 2021–22 year represents the third year of the second phase of funding (2019–2024).

In 2021–22, investment planning continues to be guided by the KPIs, the Our Land and Water Research Strategy (2019–2024) and the most recent revision of the Research Workplan (2020–2024). Our Land and Water contracted 19 new research programmes and projects, and 12 Rural Professionals Fund special projects.

2019/20	2020/21	2021/22	2022/23	2023/24
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Our Impact Goals

FUTURE LANDSCAPES

Flagship Concept:

Providing tools for land stewards to assess diverse land use options, to identify the best land use to support the vitality of te Taiao.

Theme Impact by 2024:

Decisions on land-use change and management practises can be made with confidence that they will lead to improvement in te Taiao.

Theme Impact by 2030:

The vitality of te Taiao is improving in response to our decisions as land stewards.

INCENTIVES FOR CHANGE

Flagship Concept:

Identifying rewards, signals and approaches that motivate beneficial behaviours and reciprocal relationships in the agri-food and fibre system.

Theme Impact by 2024:

New incentive approaches and value chains are motivating people and organisations to make “better decisions for te Taiao.

Theme Impact by 2030:

People and organisations in the agri-food and fibre system feel rewarded for prioritising the vitality of te Taiao.

PATHWAYS TO TRANSITION

Flagship Concept:

Working with land stewards/ organisations in the agri-food and fibre system to design new options and pathways to achieve future landscapes.

Theme Impact by 2024:

New options and pathways to enhance te Taiao are being explored by land stewards and organisations in the agri-food and fibre system.

Theme Impact by 2030:

The agri-food & fibre system is reconfiguring to enable resilient, healthy and prosperous land uses that improve the vitality of te Taiao.



Highlights and Achievements





FUTURE LANDSCAPES

The anticipated impact of Theme 1 research (Future Landscapes) is that decisions on land use change and management practises can be made with confidence that they will lead to improvements in te Taiao. The following achievements signal progress towards these anticipated Theme 1 impacts.

The first national-scale map of **surface erosion** for New Zealand that can be used at farm scale was developed. The map is also the first in the world to include the impact of stock grazing, so provides a more accurate picture of surface erosion susceptibility.

Ngāi Tahu Farming will transition an iwi-owned dairy block to regenerative agriculture principles and practices, while measuring multiple variables to build a data set that demonstrates the difference between its **conventional and regenerative dairy systems**. The trial was influenced by an earlier collaboration with the Next Generation Systems programme.

We found that modelling was a fair match to reality when we compared real world dairy farm measurements to modelling used in research that developed 20 new dairy 'typologies' to estimate the effectiveness of farmer **actions to reduce contaminant loss to water** between 1995 and 2015. This adds a layer of confidence to our analysis.

A diverse range of people are taking **action to improve water quality** in Aotearoa. What freshwater attributes do they care about most? A brief digital survey found respondents were interested in a wider range of attributes than are usually monitored, and have different interpretations of what success looks like. This survey was one of the inputs to the Monitoring Technologies working group.

The team behind MitAgator, a spatial farm planning tool commercialised by Ballance Agri-Nutrients which was derived from Our Land and Water science, **won the AgResearch Impact Award** for 2021/22.

Our Land and Water provided advice to MfE about a **risk index** to be used for assessing nitrogen losses on those fars where Overseer is unable to provide a reliable prediction.

Our Land and Water released a **national analysis of 77 catchments**, accounting for 50% of agricultural land use, showing that changes in nitrate leaching from changes in land use and land use intensity were being detected in rivers (on average) 4.5 years later. This is in line with the Government's ambition to show improvement in 5 years. However, as an average, it is important to note that there are many sites that take longer to respond.

Trends in water quality contaminants at **1051 river monitoring sites** across New Zealand are strongly controlled by variation in climate, which means that long periods of monitoring may be required before we know whether changes in land use change and intensity are reducing contaminants.

Building on an Our Land and Water-funded PhD project by Carolina Lizarralde, Fonterra spent \$180 million on upgrading their plants to **reduce nutrient loads in effluent** being applied to land from their 'ghost' farms. The cooperative is in the final due diligence steps of upgrading two other plants to the value of \$80-100 million.

An Our Land and Water **interactive map showing excess nitrogen leaching** (tinyurl.com/olw-map) and how much this could be reduced by mitigation, based on findings from two previous research programmes (Sources & Flows and Land Use Suitability), is now being used by MfE in freshwater impact assessment. The Amuri Irrigation Scheme is also incorporating the recommended actions within their farm plans.

The International Institute for Environment and Development's SENTINEL (Social and Environmental Trade-offs in African Agriculture) project is using the **Multi-Criteria Decision Making** (MCDM) framework developed by Next Generation Systems research to inform agricultural development strategies in sub-Saharan Africa, to conserve forests while also supporting a 'zero hunger' goal.

AgResearch is **advancing soil health research** undertaken with Ngāi Tahu Farming by Our Land and Water's Next Generation Systems programme, with a significant five-year research project in soil health with partners Synlait and Danone.

Methodology developed by the grains and pulses workstream of the Next Generation Systems programme, led by Leftfield Innovation, was applied to develop a blueprint for **grain, legume and vegetable opportunities** in Taranaki, as part of Venture Taranaki's 'Branching Out' programme.

The **'LandscapeDNA'** website was launched as a farmer-facing tool funded through SFFF, built from the outputs of Our Land and Water's Physiographic Environments of New Zealand research programme. Interactive maps allow you to explore right down to property scale. Videos for each environment show what contaminants are most susceptible to loss, how they travel, and where they end up. These insights will allow farmers to consider what actions they can take to minimise water contamination risks from their property. LandscapeDNA received media coverage and was presented to FAR, DINZ, DairyNZ, Beef + Lamb NZ, Rabobank, LivingBallance, Environment Southland and Thriving Southland.

Physiographic Environments of New Zealand science is also being used by the Parliamentary Commissioner for the Environment's office in a **land use modelling exercise** being undertaken in two case study catchments.



INCENTIVES FOR CHANGE

The anticipated impact of Theme 2 research (Incentives for Change) is that new incentive approaches and value chains are motivating people and organisations to make better decisions for te Taiao. The following achievements signal progress towards these anticipated impacts.

Rewarding Sustainable Practices worked closely with four research partner case studies: The AuOra Business Unit of Wakatū Incorporation, Kāti Huirapa Rūnaka ki Puketeraki, Miraka and the Foundation for Arable Research. Tailored research outputs provided to each of these case studies have been directly applied in their business decision-making.

The Rewarding Sustainable Practices research programme identified **nine attributes of successful supply chains**. This was communicated in an accessible decision-support infographic, the Value Compass. This was the final research outcome from a long-term Our Land and Water investment in research to understand and connect credence attributes to value chains (further described in impact case study #3).

The Value Project is an impact initiative from Our Land and Water that began in 2021–22 aiming to provide inspirational examples of Kiwi businesses that are deploying the nine **success factors for value chains**, and showing SME businesses how to use them to generate greater returns from sustainable production.

Integrating Value Chains research supported investment in the early development of the sheep and beef industry country-of-origin brand ‘Taste Pure Nature’ as reported as an impact case study for 2020–21. In 2021–22, Beef + Lamb NZ reported an increase of 22% in Californian consumers aspiring to buy New Zealand grass-fed beef in its target ‘conscious foodie’ consumer segment.

Participating in **farm certification schemes** can be frustrating for farmers but does lead to improvements on-farm, found a survey by Our Land and Water. Farmers found plenty to both like and dislike about the farm certification schemes, with the benefits tending to equal or outweigh the inconvenience.

Twelve **Pūhoro university students** sponsored by Our Land and Water spent their summer as interns on ten projects with organisations including Wai Wānaka, AgResearch, Lincoln Agritech and Plant & Food Research.

A think piece outlined how tauutuutu, a **key ethic for Māori business**, is driving entrepreneurship, innovation and sustainability in primary production, and creating premium value chains and products – and highlights the potential for these Māori approaches to be adopted more broadly.

A webinar series on **Regenerative Agriculture**, was timed to coincide with the release of 20 detailed reports from the research project completed in 2020–21. Five webinars were presented by researchers and stakeholder end-users, hosted by Our Land and Water, in October and November 2021, with almost 500 participants.

MfE met with **New Models of Collective Responsibility** researchers monthly. This led to MfE funding a survey of catchment groups to help the ministry deliver practical support. A webinar to present survey results was attended by 188 stakeholders from government, industry and community groups.

Researchers from the **Indicators Working Group** are now working with MPI on a programme to extend their research, helping MPI understand how to measure the impacts of its own projects. Research from this group influenced the development of MPI's rural hubs as reported as an impact case study for 2020-21. The number of rural hubs grew from 16 to 20 in 2021–22, with \$1.12 million to be invested in MPI's hubs programme over three years.

Catchment groups need tailored support with fewer strings attached. Catchment groups face challenges when engaging with the organisations that provide them with funding and support. Our Land and Water researchers are working closely with catchment groups, and provided recommendations for finding common ground. For catchment groups, it's important to agree on a shared core purpose, and plan for the end of support. Support organisations should consider tailoring their support to the needs of each group, enabling flexibility in the use of funding, and providing both financial and non-financial support.

A survey asked people in the agrifood system to prioritise the **global issues and trends with potential to change farming in New Zealand**. Climate change was again considered the most critically important factor by a wide margin among experts on all markets. The Matrix of Drivers: 2022 Update report included analysis of 8 future challenges, and open access to a well-organised evidence base of credible, relevant primary sources of information.



PATHWAYS TO TRANSITION

The anticipated impact of Theme 3 research (Pathway to Transition) is that new options and pathways to enhance te Taiao are being explored by land stewards and organisations in the agri-food and fibre system. The longer-term impact is that the agri-food and fibre system is configuring to enable resilient, healthy and prosperous land uses that improve the vitality of te Taiao.

Over 2021-22 there was less research funded in this theme, which is a consequence of needing to wait until information has been made available by Themes 1 and 2. Nevertheless, there were some significant achievements in this theme in the year to June 2022.

The directors of three National Science Challenges **co-signed a clear message** that planning to adapt to intensifying drought conditions must start now, led by regional councils, industry bodies, and central government.

The report **Growing Kai Under Increasing Dry** summarised a discussion held over a series of three webinars and a one-day symposium to kick-start a research-based conversation about climate change adaptation in the agri-food and fibre sector. Organised by Resilience to Nature's Challenges, Our Land and Water, and the Deep South Challenge, this initiative aimed to provide a foundation for people in regional councils, industry bodies, government and science to identify and expand how they can support farmers to continue to grow food sustainably as the climate changes.

A survey into attitudes towards food production after visiting a farm showed that urban Kiwis and farmers share a similar vision of sustainable farming. One surprising result was that regenerative farming was rated by urban farm visitors as the practice with the **greatest positive impact on sustainability**, which was well above the rating for organic farming. Urban farm visitors see direct-to-farmer food purchasing as the most impactful action they can make to contribute to a more sustainable food system.

In collaboration with CSIRO we analysed the adoption of eight innovations developed through Our Land and Water-funded research. Thus far, Our Land and Water-contribution has **reduced the time to peak adoption** by between 0 (e.g., variable rate irrigation) and 4 years (e.g., refinement of farm environment plans), with an average of 2 years. Our Land and Water has increased the percentage adoption (by the population of potential adopters) by between 0% (for riparian planting) and 46% (organic dairy), with an average increase in peak adoption of 22%.

New Ground magazine was created to communicate the results of 15 completed Rural Professionals Fund research projects. New Ground was circulated to all rural professionals who are members of the NZ Institute of Primary Industry Professionals in December 2021, as well as being made widely available via the Our Land and Water website and e-newsletters. The Rural Professionals Fund is a contestable fund for projects that connect rural professionals, farmers and researchers to test innovative ideas in a low-risk setting.

A further **12 Rural Professionals Fund projects** were contracted at the start of 2021-22, and these were largely completed by June 2022. Following feedback from the first round of the RPF, in the second round projects were funded up to \$75K (rather than \$50K) and for a duration of 9 months, rather than 6 months, so fewer projects were able to be approved. Topics include alternative forage and supplement feed approaches, innovative soil, water and crop moisture monitoring techniques, developing whenua enhancement plans with Māori Land Trusts, and land-use adaptation strategies for a climate-changed future.

Practical guidance and training documents for regional councils, central government and iwi from the **Implementing Te Mana o Te Wai** research (further described in the impact case study page 30). This research will continue in 2022-23, with a focus on enabling the Te Mana o Te Wai policy through knowledge development and training.

We represented the interests of collective NSCs, particularly the High Value Nutrition and Healthier Lives NSCs, on the Leadership Group for the development of the **'Mana Kai'** food system initiative from the Aotearoa Circle. This initiative evolved over the year from an attempt to build a National Food Strategy, to a conceptual framework which can provide the basis for a "movement" towards resetting the food system in Aotearoa. The Leadership Group included representatives from the agrifood sector as well as MfE and MPI.

Three webinars on **Ngā Taonga Tuku Iho/The History and Implications of Wai 262** were organized and hosted by Our Land and Water on behalf of Rauika Māngai. These webinars helped to develop a wider appreciation of the history of this claim before the Waitangi Tribunal, and its implications for research and commercial entities.

DairyNZ is updating its **Dairy Tomorrow** strategy for good farming practice to align with the FarmAPT tool developed with funding from the Rural Professionals Fund, using dairy farm typologies developed in the Phase I Sources & Flows research.

OLW contribution to other initiatives

In addition, in 2021-22, Our Land and Water researchers and staff contributed to the following stakeholder-led initiatives and documents:

- KPMG Agribusiness Agenda 2022 (June 2022)
- Environment Aotearoa 2022 (April 2022)
- Draft National Adaptation Plan, MfE (April 2022)
- New Zealand Farm Assurance Programme Plus Handbook (September 2021)
- Mana Kai framework, The Aotearoa Circle (April 2022)
- Food waste: A global and local problem, Office of the PM's Chief Science Advisor (July 2022)
- Our Land and Water's detailed submission on the Te Ara Paerangi/Future Pathways green paper in March 2022, and participation in several workshops with MBIE before and after this submission. Our Land and Water, like other NSCs, seeks to ensure that the experience of the Challenge is understood and informs the review process where relevant.
- The appointment of Our Land and Water's Chief Scientist, Professor Richard McDowell, as Editor-in-Chief of the Journal of the Royal Society of New Zealand.
- The Our Land and Water-Chief Scientist was also awarded the Hutton Medal by the Royal Society/Te Aparangi.
- The appointment of Our Land and Water's Theme 2 Science Lead, Dr Bill Kaye-Blake, to a group advising the Prime Minister on preventing food wastage in Aotearoa, including social, economic and environmental aspects at different levels of the food waste hierarchy.
- Our Land and Water involvement in advising Government on options to better manage water quality reflects positively on the value of their advice to central government stakeholders.



Rural Professionals Fund

The Rural Professionals Fund enables farmers/entrepreneurs and rural professionals to team up with researchers to test innovative ideas. Participants in funded projects are required to use their networks to grow awareness and implementation of their findings among the wider rural profession and farming community.

A second round of the Rural Professionals Fund projects closed in August 2021, with 12 projects funded from 47 applications. This time, investment has been increased up to \$75,000 per project over a longer timeframe of 9 months, with projects ranging from composting shelters as cow housing facilities to satellite technology to monitor kiwifruit canopy water content.

Most of the 9-month projects ended in mid-2022, with the research results to be distributed in December 2022 through the NZ Institute of Primary Industry Managers' (NZIPIM's) journal as well as via the usual Our Land and Water outreach mechanisms. NZIPIM is a partner in this initiative, which attracted even greater interest in the 2022–23 RPF contestable funding round.

Public outreach activities from RPF projects in 2021–22 included: a farm field day at Wainono Dairy Farm, a presentation at the eResearch NZ 2022 Conference highlighting collaboration to better manage water resources, a presentation on adaptive strategies at the Farmed Landscapes Research Centre conference as well as presentations to agri-professionals in the Ashburton District, an NZIPIM training day about waterway assessment, and an online presentation to over 150 at the Australasia Pacific Extension Network International conference.

From RPF round 1 projects 2020-21, 27 media articles were published about the RPF projects. 15 completed RPF projects had plain language articles commissioned by Our Land and Water for a new magazine titled *New Ground*. This was distributed in print to NZIPIM members and shared in Our Land and Water's e-news as a PDF. The individual RPF articles were also made available under Creative Commons license to media and industry bodies to republish, to increase the reach of the projects' results. Articles were republished 12 times across a range of mainstream and industry media outlets.

Countdown decision to test regenerative principles shaped by Our Land and Water white paper



Countdown is working with one of its biggest produce suppliers, LeaderBrand Produce, to trial regenerative agriculture principles and practices defined in a white paper funded by Our Land and Water. The commercial-scale, three-year pilot will be run out of LeaderBrand's Gisborne operation. The trial started in June 2022.

LeaderBrand grows produce including buttercup squash, broccoli, sweetcorn, tomatoes, and salad crops, on approximately 3500ha of farms located across Aotearoa. LeaderBrand is co-funding the trial with Countdown, and Plant & Food Research is involved as a partner.

Countdown is a major food retailer in Aotearoa, with 181 supermarkets serving more than 2.5 million customers a week. It has a strong interest in issues relating to food supply, climate and food security. Countdown made over 40 sustainability commitments to be met by 2025, including looking at what regenerative agriculture meant for Countdown and its fresh food supply chain.

This joint initiative from two significant organisations in the New Zealand food system will add to the body of knowledge on using regenerative practices for annual vegetable production in New Zealand. Countdown plans to share the results of the pilot with the thousands of growers and farmers that supply its supermarket in New Zealand. If positive environmental results are demonstrated, this will potentially encourage faster adoption of practices that contributed to the desired outcomes, contributing to the Our Land and Water objective to improve water quality while enhancing the production of New Zealand's primary sector.

The trial involves exploring 11 principles of regenerative agriculture defined in the white paper 'Regenerative Agriculture in Aotearoa New Zealand – Research Pathways to Build Science-Based Evidence and National Narratives', a key output from a Regenerative Agriculture research project funded by Our Land and Water and led by Dr Gwen Grelet, senior scientist at Manaaki Whenua – Landcare Research.

The research was initiated in response to increasing numbers of farmers transitioning to regenerative agriculture in New Zealand, and multinational food companies (including McCain, PepsiCo, Nestlé, Unilever, General Mills and Danone) promoting its uptake globally. The white paper set out 17 priority research topics identified by representatives of New Zealand's agri-food system, and introduced 11 principles for regenerative farming in New Zealand.

“We have used the white paper as a basis for our thinking, as well as drawing on international and New Zealand research,” says Kiri Hannifin, Countdown's Director of Sustainability. “The white paper pulled everything in the New Zealand context together nicely and gave us a strong platform for continuing our conversations in the regenerative agriculture space.”

Represented by Ally Orr (Communications Advisor, Countdown) and Sharleen Gargiulo (Sustainability Manager – Human rights and food systems, Countdown), Countdown participated in three of four agricultural sector working groups that shaped the research priorities defined in the white paper. “It was great being part of the working group to hear perspectives from different parts of the industry, and different contexts. A lot of honesty comes where there is no commercial relationship,” says Ms Orr.

Due to the independent, cross-institute nature of the National Science Challenges, as funder of this research Our Land and Water had a unique convening power that encouraged the participation of a wide and diverse range of people across the agri-food and fibre system in these working groups.

After gathering information from the working groups, white paper, and undertaking its own literature-based research, Countdown decided the best pathway

forward was to test regenerative farming principles on the ground and worked with LeaderBrand and Plant & Food Research to put together a programme of work for a pilot trial.

A demonstration trial site will be established to evaluate the impacts of using compost and cover crops across two crop rotations: winter salads and a main summer crop. The trial site will run alongside a control site operating under current management practices. Both sites will measure soil chemistry, physics and biology, to evaluate the effects of regenerative management practices on production, soil health outcomes, and environmental risks such as nitrate leaching.

Key focus areas for the pilot include looking at the use of compost as a supplementary nutrient source and soil conditioner to improve soil health; the strategic use of cover crops to improve soil health and recycle nutrients; and the role of perennial planting in the farmscape to facilitate ecosystem restoration. The project will also look at how implementing these regenerative practices and principles affect local communities, iwi, and workers on farm, and will integrate feedback from those stakeholders.

Contact:

[Dr Gwen Grelet, Manaaki Whenua Landcare Research](#)

Scientific Quality

OLW is performing well according to standard metrics used to assess science quality.

22 journal articles were published since our previous annual report. 18 were published in 2021-22, and a further 4 publications related to the previous financial year.

49 other science outputs were delivered, including 13 presentations by OLW researchers at conferences.

Our Land and Water researchers were invited to give 2 keynote presentations at domestic conferences (face-to-face international conference participation was severely curtailed in 2021-22).

We invested in 19 new research programmes and projects, and 12 Rural Professionals Fund special projects. This included the launch of the final major research programme for OLW, Revitalise Te Taiao: A place-based approach to support purposeful change and resilience (\$7.4m).

Best Research Teams

Choosing the best research teams is the first step to ensuring research excellence. Our Land and Water research teams bring people together from a range of disciplines, from across universities, all of the CRIs, businesses, industry bodies, Māori, government and non-government organisations, private citizens and regional councils.

Stakeholders are collaborators and co-innovators in all our research design and implementation, either in advisory or research roles. Including stakeholders in research teams helps to break scientists out of their routine ways of thinking and working, promotes cross-fertilisation of perspectives with respect to both problem definition and study design. Stakeholders can also provide strategic insights for achieving higher impact to the research and help identify capability gaps.

Our Land and Water recently completed the final iteration of the Research Landscape Map (RLM). The RLM is designed to determine level of alignment towards Our Land and Water's mission, but also collects other metrics including data on collaboration. See page 17.

For the 90 research programmes most aligned to Our Land and Water's mission, the mean number of collaborators was 4.8, compared to 3.7 in those (88) research programmes which were not aligned. Those programmes receiving Our Land and Water investment have consistently maintained a higher level of collaboration than aligned or non-aligned programmes. This reflects the wide diversity of research being undertaken, our use of co-innovation and co-design which includes stakeholders in research teams and our strategy to invite participation in Our Land and Water research from a broad range of providers.

Māori-led and Kaupapa Māori research funding was **51%** of OLW's total research investment in 2021/22, increasing almost **6%** on previous year.

44% of journal publications were co-authored with stakeholders over 2021-22, ensuring Our Land and Water science is relevant and applicable.

82% of publications in the top 25% of journals involved authors from different institutes or organisations in New Zealand.

57% of the OLW Governance Group members are Māori, maintaining the commitment that at least 50% of members must have depth of experience in te ao Māori at any given time. Leadership by Māori within the OLW Directorate including Senior Leadership and Theme Leaders remains the same as 2021-22 at **35%** (of total FTE).

Quarterly meetings are held with Ministry for Primary Industries, the Ministry for the Environment and DOC to discuss research capability needs, particularly about the anticipated development of policy affecting land and water management.

100% of new research programmes, Working Groups and Think Pieces were co-designed with stakeholders in 2021-22.

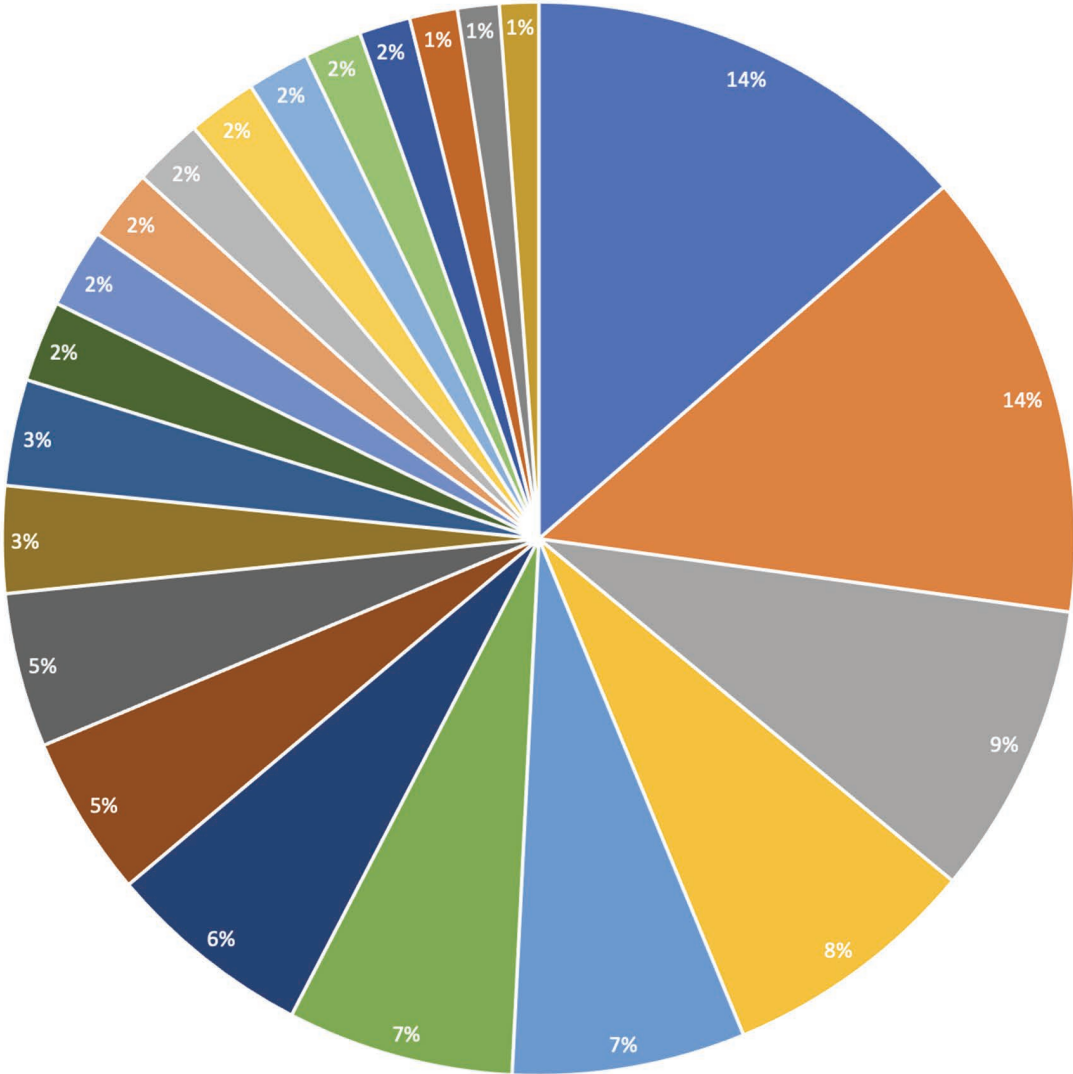
In 2021-22, of the **8** large (>\$1million investment) research programmes underway, **5** (63%) were either led or co-led by Māori.

4 dedicated leads are required in large research programmes, accountable for: science excellence, te ao Māori, implementation of the research, and project management. We expect 0.25FTE to be dedicated to each role.

Funding Distribution

OLW collaborated with significantly more organisations in 2020–21 than in previous years. Funding is being distributed more widely, beyond large research institutions.

Organisations funded over \$100k



- AgResearch
- Manaaki Whenua Landcare Research
- Lincoln University
- Plant & Food Research
- Aquanet
- AgriSea NZ Seaweed (Rere ki Uta Rere ki Tai)
- WAI Wānaka (Knowledge into Action)
- SCION
- Cawthron Institute
- Land Water People
- National Institute of Water and Atmospheric Research (NIWA)
- JD Reid Ltd
- Ngāti Tāwhirikura Hapū Charitable Trust (Te Kāhui Rau)
- Land and Water Science
- Dairy NZ
- IT Effect
- Poipoia Ltd
- Te Pōtiki National Trust
- Massey University
- Nukuroa Consulting
- Happen Consulting
- ESR

Aligned Funding

Our Land and Water (Our Land and Water) collects and analyses data for all research of relevance to the Our Land and Water mission every two years, via a Research Landscape Map report. This report provides a snapshot of recent and current research aligning to each of the Challenge's themes, identifies current level and sources of investment, determines the potential contribution of each research programme to the Challenge's mission within 10 years, and informs the process of identifying and filling research gaps through alignment and investment.

Data from our 2021–22 edition (the fourth) of the Research Landscape Map identifies \$60 million/yr invested in research that makes a high contribution to the Challenge mission, out of a total of \$106 million invested in the 178 research programmes of relevance to land and freshwater management. Of the \$60 million invested in research most aligned to the Challenge, the alignment is greatest with our Future Landscapes theme (\$53 million/yr) with \$5 million/yr and \$2 million/yr aligned to our Incentives for Change and Pathways to Transition themes, respectively.

As a matter of consistency, Our Land and Water compared investments in the Future Landscapes theme by sub-topic from previous editions of the Map. Investments have increased in 'Climate and Climate Change Effects' in response to the Government's carbon targets (Climate Change Commission 2021). Investment in 'Water Quality Limits and Mitigations' has decreased as more work is directed towards 'Farm Systems', perhaps in recognition that mitigations alone will be unlikely to meet water quality targets under the National Policy Statement for Freshwater Management, and so land use change may be necessary.

We estimate that there was \$59,500,000 of aligned research funding in 2021–22.

Our Land and Water partnership with Pūhoro STEMM Academy is building Māori science capability



Of the 39 Pūhoro STEMM Academy (Pūhoro) student interns sponsored by Our Land and Water in the summer of 2021–22, 22 rangatahi have expressed their commitment to progress into post-graduate study.

Māori are anticipated to make up 30% of the workforce by 2030, but currently represent less than 2% of the scientific workforce. Growing the capability of Māori scientists will support the achievement of Our Land and Water’s objectives, and our national ambitions for freshwater and agriculture. With national freshwater policy now led by the principle of

Te Mana o Te Wai, and te Taiao as a core pillar of MPI’s ‘Fit for a Better World’ roadmap to 2030, increasing Māori science capability will enable the RS&I sector to authentically centre these te ao Māori concepts in research, and effectively co-develop research with iwi, hapū and communities.

The Māori agri-food sector is significant, with \$13 billion in primary sector assets including 30% of all beef and lamb production. This sector also needs the support of Māori scientists to continue to grow value while upholding kaitiaki values, influencing positive change in agribusiness throughout Aotearoa.

Since 2017, Our Land and Water has been a primary funder of Pūhoro, a nationwide programme that supports rangatahi Māori by uplifting their achievement in STEMM (science, technology, engineering, mathematics and mātauranga Māori). Pūhoro works to demystify tertiary education for its secondary students, with a full-day wānanga each term providing access to university laboratories and teaching, showing that university study is achievable.

Our Land and Water provides base funding for Pūhoro of \$150,000 per annum, additional sponsorship of \$50,000 per annum for the internship programme, and funds two scholarship opportunities for Master's students for \$40,000. Our Land and Water investment has supported the expansion of the Pūhoro programme from 97 rangatahi in 2016, to 1503 in 2022. These rangatahi are actively exploring STEMM education and career pathways from secondary school (year 11–13) into tertiary education and the workforce.

Pūhoro has seen significant success, with students in the programme achieving at or above the national achievement rate of non-Māori students in STEMM subjects. Pūhoro rangatahi are five times more likely to transition to tertiary study in STEMM.

A cost-benefit analysis by Matatihi for ESR in August 2021 found the potential economic benefits of Pūhoro outweigh the economic costs by a factor of more than 14 for secondary students, and 16 for tertiary students. The net benefit for the high school program is greater than \$60 million, and \$32 million for the tertiary program.

The Pūhoro internship programme began in 2018, with Our Land and Water as one of the first sponsors. The internship programme enables Pūhoro tertiary (and where possible) Year 13 students to gain exposure to career opportunities in STEMM, and work in science environments while being mentored by people committed to building Māori science capability.

Over four years, Pūhoro has created over 100 paid internships for rangatahi through a diverse network of partners, many in response to calls for internships from Our Land and Water. For the upcoming summer (2022–23) over 65 rangatahi have expressed an interest in participating in the internship programme. Often intern hosts will invite the same Pūhoro intern to return to them, which has created strong multi-year relationships, and further fostered the opportunity and desire for rangatahi to pursue post-graduate study.

“Our partnership with Our Land and Water has opened up these pathways for our rangatahi,” says Kemp Reweti, COO, Pūhoro Charitable Trust. “They have been able to bring into these diverse spaces their unique Māori worldview and perspectives, which has enhanced the activities being undertaken.”

Pūhoro has identified a clear connection between the early and continued investment into the programme by Our Land and Water and the increased appetite of other partners and funders to invest in the Pūhoro kaupapa. Initially hosted by Massey University, Pūhoro is now an independent charitable trust operating by Māori, for Māori and with Māori. The Pūhoro Charitable Trust now receives funding from the Ministry of Education, ESR, and other committed partners.

“Pūhoro has always felt acutely the strength of support and tautoko from Our Land and Water throughout the early formative years of Pūhoro, through to today,” says Reweti. “Our Land and Water has championed our vision, and supported our initiatives and programme unequivocally, from wānanga each term through to career exposure. Having the backing of Our Land and Water had the flow-on effect of solidifying other avenues of support and funding for the Pūhoro kaupapa. It also provided a positive example for other National Science Challenges to explore Pūhoro and understand our mission and objectives.”

Contact: Kemp Reweti, Pūhoro STEMM Academy

Commitment to Te Ao Māori

Last year Our Land and Water focussed on building trusted relationships with Māori researchers, practitioners and entities who could contribute to the delivery of Our Land and Water aspirations.

In the last year we have increased the number of mātauranga Māori experts contributing directly to Our Land and Water research to 65 (an increase of 26%). This figure does not include extended teams within Māori case study partners, which would likely increase this figure by 3–4 times.

Fifteen of these people are working across multiple Our Land and Water research programmes (an increase of 60%).

The increase of capacity and capability across Our Land and Water programmes, coupled with an increase of researchers working across multiple programmes supports the ability of programmes to more effectively partner with Māori and further advance the development of mātauranga Māori.

A Vision Mātauranga assessment tool *Te Ara Hourua* developed by Our Land and Water is a tool for assessing the maturity of programmes in their approach to empowering Māori knowledge, empowering Māori resources, and empowering Māori people. It is also for building capability by articulating what that can look like in practice. The rollout of the tool across all large Our Land and Water funded programmes (over \$1m) was also shared with other stakeholders and partners, including CPG.

In 2021–22, three new Our Land and Water-funded research initiatives were developed that support both partnership, and leadership in Māori knowledge systems including:

Revitalising Te Taiao research programme (\$7.4m) has three place-based pilots, geographically spread across Aotearoa. These provide specific evidence-based examples of how agribusinesses and communities can progress land uses, management, value chains and markets to revitalise te Taiao.

Ngā Tohu o Tai-o-Rongo is a participatory action-based kaupapa Māori research programme that draws on kōrero tuku iho and its application within Māori agribusiness and iwi environmental units. The research programme was designed in 2021–22 by a working group and aims to reconnect kaimahi (workers) and uri (descendants) to revitalise te Taiao through three customary knowledge spheres (Ngā Tai o Te Rangi, Ngā Tai o Te Nuku, and Ngā Tai ā-Tangata). The programme aims to build capacity and capability within Māori agribusiness and iwi environmental advocacy, and put Māori ancestral knowledge systems at the centre of Māori agribusiness design.

Tāwharautia te Wahapū o Waihi seeks to combine mātauranga ā iwi and estuarine science to restore mahinga kai and tohu connectivity in Waihi estuary. Part of the broader Estuarine Health/Ki Uta Ki Tai research collaboration between Our Land and Water, Sustainable Seas and MfE, this particular element is led by Te Rūnanga o Ngāti Whakahemo. The project aims to address aspirations in halting ecosystem degradation and assist restoration action. The main body of research will be undertaken in 2022–23.

OLW's Māori research partners

Māori stakeholder groups that were involved in OLW research in 2021-22 span the length of Aotearoa and include:

Northland hapū, marae and whānau growing collectives

Oromahoe and Te Tii marae through the Waitangi catchment group

Te Arawa Primary Sector Group

Te Arawa Lakes Trust

Ngāti Rangiwewehi

Miraka

Hikurangi Takiwa Trust

Te Papatipu o Uepohatu Trust

Tātau Tātau o Te Wairoa

Ngāti Raukawa

Te Taiuhu Te Taiao Kaitiaki rōpū (including Ngāti Rārua, Te Ātiawa, Ngāti Apa ki te Rā Tō, Ngāti Koata, Ngāti Tama, Rangitāne, Ngāti Kuia)

Ngāi Tahu Farms

AuOra (Wakatū Incorporation)

Ātīhau Whanganui Incorporation

Ngāti Tawhirikura Te Kāhui Rau

Te Rūnanga o Ngāti Whakahemo

Southland Te Ao Mārama Inc (Ngai Tahu ki Murihiku)

Te Uri o Te Ngahere Trust

Akapatiki A Block Incorporation

Pūrākaunui Incorporation

Of the entities and collectives identified, Ātīhau Whanganui Incorporation, Ngāti Tawhirikura Te Kāhui Rau, Te Rūnanga o Ngāti Whakahemo, Southland Te Ao Mārama Inc (Ngai Tahu ki Murihiku), Te Uri o Te Ngahere Trust, Akapatiki A Block Incorporation and Pūrākaunui Incorporation are new to OLW in the last 12 months.

Ngā Taonga Tuku Iho

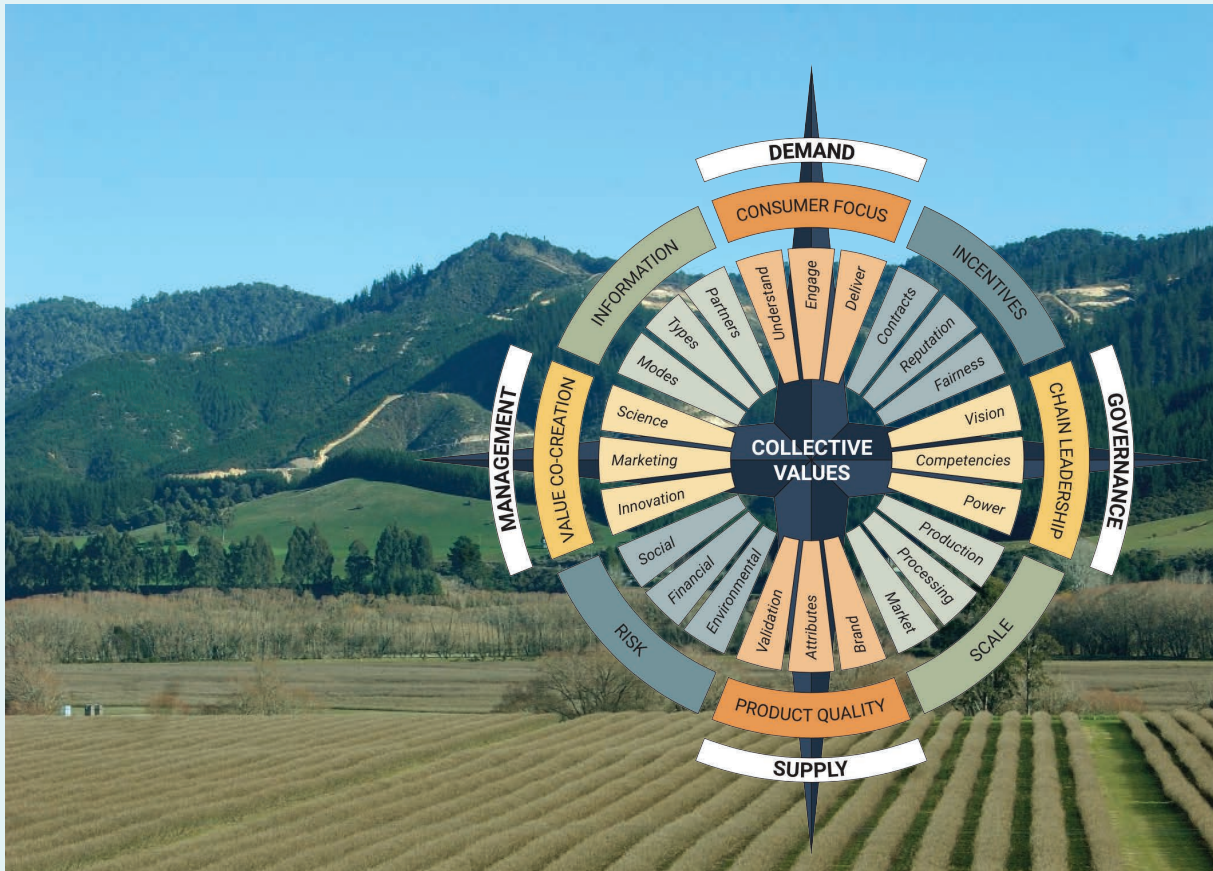
Our Land and Water led and hosted, on behalf of Rauika Māngai, three webinars titled Ngā Taonga Tuku Iho. The webinars were strongly subscribed with 908 individual registrations across the three sessions.

The first session, featuring Aroha Mead and Sheridan Waitai on the history of the Wai 262 claim and what it means for science, had an additional 558 views following the live webinar via the online video.

The webinars are important in building awareness, consciousness and capability in the issues associated with Wai 262, particularly for the research sector.



Sustainability premiums are more widely accepted, supported by evidence



Many New Zealand food exporters now believe consumers in our export markets will pay a premium for sustainable products. Research funded by Our Land and Water has contributed to this change in attitude.

This shift is important, because to achieve Our Land and Water’s objective to increase the value of New Zealand’s primary sector, without impacting further on water quality, agribusinesses must have confidence that sustainability premiums can be achieved before they incentivise on-farm sustainability actions.

Three Our Land and Water research programmes contributed evidence and engaged with stakeholders to support this change: Integrating Value Chains, led by Professor Caroline Saunders, director of the

Agribusiness and Economics Research Unit at Lincoln University (AERU); Rewarding Sustainable Practices, led by Professor Paul Dalziel, deputy director, AERU; and Credence Attributes on Farm, led by Gina Lucci, senior scientist, AgResearch.

Professor Dalziel reports there was widespread scepticism in 2014 about this opportunity. A MBIE Science Board previously turned down a previous research proposal very similar to the Integrating Value Chains programme, noting “the assumption around sustainability premiums on export products in terms of economic advantage, and the likely increase in GDP” was an “untested assumption”.

Our Land and Water funded two AERU-led programmes between 2016 and 2022 to deliver new knowledge on how international consumers value

New Zealand food exports, and on how to create and capture greater value for New Zealand food and fibre exports. Researchers worked alongside nine agribusinesses that were transforming commodity supply chains into premium value chains, to create and validate this new knowledge. The key finding was the identification of nine key characteristics common to value chains that successfully reward food producers for sustainable choices.

From 2017 to 2019, the Credence Attributes on Farm project filled an important knowledge gap regarding the costs and benefits of delivering sustainability attributes on-farm. A key finding was a meta-analysis showing, on average, consumers would pay 36% more for organic, 25% more for grass-fed and 24% more for “environmentally friendly” products. The research demonstrated that farmers could maintain or grow profitability under carbon-neutral scenarios, and this could also reduce on-farm nitrogen leaching by up to 40%.

Below are three selected examples of how these findings have supported growing acceptance that people in export markets will pay sustainability premiums.

First, the ‘Trade for All’ Advisory Board published a report in November 2019 that included research from Integrating Value Chains, in a section devoted to credence attributes. Trade for All made recommendations to government to support the development of trade that supports sustainable economic development. It informed the ‘Trade Recovery Strategy’, a Covid response that in June 2020 allocated an additional \$216 million to strengthen NZTE’s services to exporters. This in turn supported initiatives such as the ‘Made with Care’ country-of-origin campaign positioning New Zealand as an ethical and sustainable food producer, which by June 2022 had been utilised by over 750 food and beverage exporters and industry associations.

Second, the potential price premium for sustainable dairy products identified by the Our Land and Water-funded meta-analysis was referenced in the announcement of the Toitū Envirocare carbon zero certification programme for farms in August 2020. This programme aims to demonstrate that pastoral farms can be both carbon-neutral and commercially viable.

Third, AERU researchers were engaged by the Primary Sector Council (PSC) to produce a situational analysis of Aotearoa’s food and fibre sector, which drew heavily on Integrating Value Chains research. This informed MPI’s ‘Fit for a Better World’ strategic roadmap. The PSC’s 2020 report supported an attitude shift towards sustainability premiums: “It’s a mission we must put in front of every person in our sector and every person we work with.... We can stand for supplying distinctive, safe, outstanding, ethically produced, high-value foods and fibres to people who will value them.” The 2022 report from Te Puna Whakaaronui, the post-PSC think tank, reads: “Targeting products to consumers who are willing-and-able to pay a premium will be essential for our overall success.”

Compared to 2016 when Our Land and Water began, today a range of organisations and programmes promote the premiums available through highlighting sustainable attributes. Research funded by Our Land and Water has converged with aligned research financed by the MBIE Endeavour Fund and from private sector consumer insights organisations, to contribute to this broader acceptance of sustainability premiums, by demonstrating there is genuine value to be gained. This increased acceptance will ultimately lead to more New Zealand food exporters undertaking sustainability initiatives to capture higher returns while restoring the health of our land and water.

Contact: Paul Dalziel, AERU

Stakeholder Engagement

For the final two years of Our Land and Water, engagement with land stewards, rural professionals, Māori land trusts and incorporations, and primary sector bodies is particularly critical. In March 2022, a Rural Engagement Advisor was employed to extend the reach of Our Land and Water research into the agrifood and fibre sector. Mark Woods has been connecting with his rural contacts to assess farmers' current needs and understanding of freshwater management, their levers and challenges.

Over half of the **40** Our Land and Water research projects funded in 2021–22 actively engaged with a sector body, agribusiness, iwi, government or regional authorities during the financial year. This included over **16** regional authorities, regional development agencies and cross-council special interest groups, as well as **8** government ministries or agencies. Research projects also directly engaged with **5** primary sector bodies, **6** banks and financial organisations, **4** NGOs, **9** catchment groups, and **10** agribusinesses. The latter included **4** Māori agribusinesses, and over **15** Māori community, whanau, hapu and iwi groups.

Examples of new research being co-created with stakeholders include:

Whitiwhiti Ora/Land Use Opportunities had direct discussions with banks and the Sustainable Agriculture Finance Initiative in 2021–22. The idea to form a bank-user group to work together on common datasets for use in a “pre-commercial” space relating to agricultural investment is being explored.

Rewarding Sustainable Practices continued to collaborate closely with its four agribusiness research partners. Opportunities for future collaboration were discussed with Wakatū Incorporation and Miraka. An online meeting with Kelliher Charitable Trust and a keynote address at a Beef + Lamb NZ field day on the Trust's Glencairn Farm, were followed by the Trust providing an additional case study for the programme. The programme reports every six months to an Advisory Board of 20 agri-food leaders who advise on the research and use the research findings in their work.

Estuarine Health/Ki uta ki tai is a new programme with Sustainable Seas NSC, co-funded by MfE, that has three Healthy Estuaries case studies led by mana whenua. The programme has engaged Manaaki Whenua's Strategic Stakeholder Relationships Manager to connect with Regional Council special interest groups to discuss regional land-use scenario modelling. A short presentation at Horizons' Regional GIS Forum introduced the project to regional and district council staff, central government, academics, and representatives from industry bodies.

Growers from **Pā to Plate** research participated in the Whangarei Growers Market in April 2022, selling fresh and processed kai as well as rongoā and some plants, where sales more than doubled from the previous year. In the past year the project has brought more learner or intermediate growers on board, and the collective now consists of 5 foundation growers and 8 less mature growers. Several growers are now growing winter gardens, which represents a change in the mindset of the wider collective.

Both of Our Land and Water's calls for research proposals issued in 2021–22 required stakeholder involvement. Proposals for the Contestable Funding Round were required to be scoped with stakeholders to accelerate research impact. Proposals for the RPF required the project team to include a rural professional and farmer to ensure the research resulted in practical outcomes and advice.

Public Outreach

Public communication and participation are central to OLV, with effective outreach regarded as a key to success and a critical component of the National Science Challenges. Our intention is to connect science with land stewards, making our knowledge, research outputs and resources accessible to all.

Over 2021–22, OLV researchers recorded 30 public outreach or participation activities related to their research. Of these, 16 were connected to Rural Professionals Fund projects and were targeted at farmers and/or their advisors.

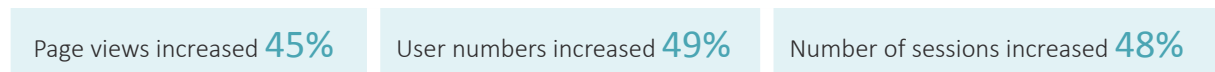
The Rewarding Sustainable Practices research programme is particularly active in public engagement. Professor Caroline Saunders gave two high profile addresses:

- An opening keynote at E Tipu: The Boma Agri Summit with 500 registrations and others attending virtually (covered in five media articles), and at the Primary Industries Summit, attended by 200.
- A workshop at the E Tipu summit was attended by 150 people. The project lead, Professor Paul Dalziel, participated in Our Land and Water’s Regenerative Agriculture webinar series and gave eight public seminars on the connection of wellbeing economics to business enterprise. ‘The Value Project’, is an additional impact initiative connected to this research programme.

Pā to Plate has also engaged regularly with the public with three successful market days and continued outreach to support new marae gardens from Ngāti Manu, and in two in Parakoa and Matawaia. MSD funded six full-day wānanga in March and June 2022, for the researchers and the grower collective to kōrero processing and fermentation methods for fresh kai. Approximately 15 marae community members attended the wānanga.

The website design was refreshed off-line in 2021–22 and is now in the final stages of development, due to launch in spring 2022. This update features a resource search filter to enable direct access to information relevant to the user’s role and interests.

The current OLV website has continued to reach an increasing audience in 2021–22.



Further increase in media coverage, building on the significant increase in 2020–21, saw 108 mentions of OLV (or OLV research) in mainstream, industry, and rural media for the year 2021–22, up from 91 last year.

Audience numbers across all OLV-owned channels also increased in 2021–22: LinkedIn followers by 194%, e-newsletter subscribers by 50.7%, Twitter followers by 5.4%, and Facebook followers by 11.6%. A newly launched Instagram channel in June 2022 gained 79 followers in that first month.





Research in Plain Language

Through 2021-22 Our Land and Water issued 2 Research Findings Briefs to summarise and synthesise published academic findings:

- Designing freshwater monitoring programmes to detect early improvement (August 2021)
- Supporting complex decisions on land-use changes (January 2022)

Feedback on these plain-language outputs has been positive, with rural professionals (e.g., a farm environment plan consultancy) reaching out for more information.

Our Land and Water continues to summarise research findings and outputs as news stories on our website:

- 58 news articles published in 2021-22, up from 38 in 2020-21
- 30 of these included plain language research summaries, including 15 RPF project summaries

Partnership

- Our Land and Water remains an exhibition partner for the Te Taiao exhibition that opened at Te Papa in May 2019, which has been seen by 1,672,059 manuhiri since opening. The exhibition received 352,715 visitors over 2020–21 and was again the most-visited space in Te Papa for the year.
- Our Land and Water partnered with Eat New Zealand this year to sponsor the ‘Kaitaki Collective’, a talented group of 28 young New Zealand influencers aged 16–35, coming from all over the country. They each represent a different aspect of our food system and are committed to championing change. Collectively the Kaitaki Collective has a social media reach and audience of over 145,000+ followers, allowing powerful and authentic communication to our next generation of eaters.
- In early 2022 Our Land and Water partnered with Shepherdess magazine, a contemporary womens’ lifestyle title with good connections into rural Aotearoa, sold in over 500 retail outlets nationwide including 57 Farmlands stores. Each issue has an estimated readership of 18,000+. The autumn issue featured a profile of Our Land and Water researcher Tina Porou, and included key messages from the Implementing Te Mana O Te Wai Working Group. The winter issue featured a profile of Jo Leyland speaking about her catchment collective, supported by key messages from Our Land and Water’s Register of Land Management Actions programme.



The Value Project

The Value Project is an impact initiative from Our Land and Water to expand awareness and understanding of the 9 attributes of successful supply chains, as identified by the Rewarding Sustainable Practices research programme. The campaign launched in May 2022 with a dedicated website (thevalueproject.nz). This had generated

over 1500 website visits and 2500 page views by the end of June 2022, with time-on-page indicating the content is being read in full (just over 4 minutes on average). Social media posts about the project have also been popular, particularly on LinkedIn. The workshop at the E Tipu Summit was also well attended (see page 26).



Regenerative Agriculture

Through October and November 2021, 20 reports produced by the Our Land and Water-funded Regenerative Agriculture Think Piece were released in five 'bundles', each with an associated webinar profiling the range of science and stakeholder expertise being applied to identifying knowledge gaps for regenerative agriculture in a New Zealand context.

Over 350 people registered per webinar, with a total of 482 individuals registering, 290 of which were new contacts for Our Land and Water and less than a third were researchers. The 20 reports and white paper summary were downloaded more than 1360 times.



Eight iwi and three councils built a partnership to respond to Te Mana o Te Wai in Te Taihuhu



Environmental managers from eight Te Taihuhu iwi are co-designing a freshwater management framework with the region's three unitary councils, supported by Our Land and Water Implementing Te Mana o Te Wai research. The Pou Taiao (iwi environmental managers) have built a new platform for partnership, Te Puna Kōrero ki Te Taihuhu, to enable multi-council collaboration to ensure the health of wai in the region is prioritised.

The NPS Freshwater Management (2020) prioritised Te Mana o Te Wai, initiating a policy transformation to grant the first right of water to its own health and vitality, and to thereby protect wai for future generations. The policy is an important lever that, if implemented effectively, will help Our Land and Water achieve its objective to maintain and improve freshwater quality in Aotearoa.

Te Mana o Te Wai signals a significant shift in the role of iwi, in partnership with councils, in the

management of water. However, there are few practical tools and resources to support both iwi and councils to implement this policy priority effectively. Led by Tina Porou (Poipoia Ltd) and funded by Our Land and Water's Implementing Te Mana o Te Wai project, Te Taihuhu iwi co-created a suite of tools, resources, and case studies to support iwi and councils around Aotearoa to build their understanding of what was required to effectively implement the new policy.

Te Taihuhu, the top of Te Waipounamu, was featured as a case study area for this project because the Pou Taiao from the eight iwi were willing to work collaboratively to proactively engage with the three councils.

Te Taihuhu stretches across the boundaries of three unitary councils (Marlborough District Council, Nelson City Council, and Tasman District Council). Within the same landscape there are eight iwi (Ngāti Kuia, Rangitāne, Ngāti Apa ki te Rā Tō, Ngāti Rārua, Ngāti

Tama, Te Ātiawa, Ngāti Koata, and Ngāti Toa) with statutory acknowledgement across the three councils, but different tribal interests and settlement provisions.

Historically, the three councils engaged iwi on environmental matters and regulation changes by inviting the Pou Taiao of individual iwi to meetings to comment on the council's pre-planned approach or changes. The Pou Taiao had not worked as a collective in responding to matters relevant to all three councils.

To implement the NPS-FM (2020), the three councils jointly presented to all the Pou Taiao for the first time. Pou Taiao collectively requested time to consider what had been presented before providing feedback, noting that community consultation on the council freshwater plans (including work to describe community values for water bodies) was already underway. The Pou Taiao had concerns regarding the magnitude of what had been presented, its importance to iwi, and the discomfort of commenting on plans that were well progressed. It was at this point they were invited to collaborate in the Implementing Te Mana o Te Wai research.

Our Land and Water has two qualities that made it uniquely suitable funder: an impact focus that supported the creation of practical tools and processes to support iwi to build a partnership with councils; coupled with a commitment to meaningful partnerships with Māori, which created a space for iwi representatives to co-create these practical tools.

This collaboration identified the need to establish a collective Iwi Working Group and build the partnership platform with council. Project workshops built this group's understanding of the policy reform,

its requirements and implications. Critically, the workshops emphasized the processes and investment required to partner with council effectively for the benefit of wai.

"It changed how we talked to councils about projects, not just Te Mana o te Wai. [We now consider and discuss] everything from the issue itself to the time frames, resourcing, iwi internal capability and capacity" says Rowena Cudby, Pou Taiao, Environmental Manager, te Runanga o Ngāti Rārua.

With this understanding, and using the tools and resources created by the research project, the Iwi Working Group developed a clear plan to re-engage council in a way that shifted iwi from reactive consultation parties, to proactive Treaty partners. The councils have agreed that processes for joint planning and decision making with iwi will need to change for successful policy implementation to occur.

The Iwi Working Group also developed a proposal to action the detailed plan drafted for the case study and, supported by councils, secured an additional \$776K funding for implementation through MfE and \$70K (plus in-kind staff resources) from the councils.

Contact: Tina Porou, Poipoia Ltd

Governance

Governance and management arrangements for Our Land and Water have all remained stable and engaged in constructive support for the Challenge throughout 2021-22. All are now focussed on realising and optimising the impact of Our Land and Water, and where necessary, re-evaluating their role and contribution to ensure they are best able to support this priority for Our Land and Water.

An external review of OLW's governance was completed by EQI Global in June 2021. The review concluded that the Governance Group members, Stakeholder and Science Advisory Panel members and the Challenge host are all strongly engaged with, and contribute to, the OLW vision and purpose.

Governance Group

Governance of Our Land and Water is through a single Governance Group, in which at least 50% of the membership are required to have a deep understanding of te ao Māori perspectives. Following the resignation of 2 long-serving governors in 2021-22, Joanne Davidson, a PAMU Director with food and beverage industry experience was invited to join the Governance Group, to strengthen the connection with primary agribusiness.

Evidence of the OLW Governance Group's attention to strategic leadership includes their commitment to actively guiding the Directorate towards actions that will optimise the impact of OLW research at the end of Phase 2 (June 2024). They have also raised the issue of planning for an uncertain post-2024 future through the NSC Chairs meetings hosted by MBIE.

They actively supported Our Land and Water submission on Te Ara Paerangi/Future Pathways, as well as co-ordinating a submission from the NSC chairs supporting the submission from Rauika Mangai.

Science & Stakeholder Advisory Panel

To shift the emphasis of Phase 2 research towards achieving greater impact with land users and managers, the Science Advisory Panel (SAP) was expanded to include leading scientists with experience of land steward's needs and perspectives, including those of Māori agribusiness. The 8-member group includes 4 research scientists and 4 experts in science implementation, with 4 based in Aotearoa and 4 overseas.

The SSAP met with Our Land and Water to workshop research topics for the Contestable Funding Round, and the Chair of the SSAP, Professor Gill and other SSAP members made a significant contribution to Our Land and Water's submission on Te Ara Paerangi.

Challenge Parties Group

The Challenge Parties Group (CPG) membership remained largely unchanged through 2021-22, with only two parties changing their representatives due to staff departures (Scion and Victoria University).

There was consistently high attendance at CPG quarterly meetings, and constructive discussions. Most recently the Vision Mātauranga assessment tool, developed by Our Land and Water, was provided to the CPG members for their use, in recognition of their role and value to the Challenge.

Researchers from the CPG membership are well, but not exclusively, represented in the active and proposed research programmes of Our Land and Water.

Contact Us

E: ourlandandwater@agresearch.co.nz

Learn More

W: ourlandandwater.nz



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