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Research Landscape Map for the National Science Challenge: Our Land and Water (4th Edition, 2022)



Report for OLW | Rich McDowell, Helen Percy, Bill Kaye-Blake, Susie McKeague, Selai Letica, Tony Petch

Research Landscape Map for the National Science Challenge: Our Land and Water Totiū te Whenua, Toiora te Wai (4th Edition 2022)

July 2022

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Table of Contents

Summary	1
1. Introduction	3
2. Methodology	4
3. Outputs	7
3.1 Metrics	8
3.1.1 Investment	8
3.1.2 Collaboration	11
3.1.3 Use of enabling themes	12
3.2 Relevance assessments	15
4. Discussion	18
5. References	20
Appendix I	21

Summary

The development of a fourth edition of the Research Landscape Map (RLM) for the Our Land and Water National Science Challenge, Toitū te Whenua, Toiora Te Wai (the Challenge) has delivered a rich understanding of the current research landscape, particularly work that has the potential for medium to high impact to help achieve the Challenge mission.

Research providers, funders and stakeholders were asked to supply briefs of all research programmes (live as of July 2021), larger than \$50K per annum, which delivered outcomes complementary to the original Challenge strategy. Independent assessors assessed the projects according to their likely contribution to the mission of the Challenge. Outputs from the mapping exercise are available to all.

The fourth edition of the RLM has an inventory of 178 research programmes. Compared to previous editions of the RLM several factors were noted:

- Of the total annual investment (\$106M) most (\$102M) was from Government (MBIE or Other) or Crown Research Institute Strategic Science Investment Funding (SSIF). This represents a 37% increase since the last RLM. Of the MBIE contribution, the Challenge accounted for \$14.8M. The majority of 'Govt – other' funding was sourced from the Ministry for Primary Industries associated with Climate Change research. Increases in CRI SSIF funds between the second and third RLM were maintained in the fourth edition. These funds are used strategically by the CRIs in support of, for example, industries affected by Government policy. Increases therefore occurred before competitive funding sources (e.g., Govt - MBIE).
- The distribution of funds within the Future Landscapes theme has changed considerably with increased research investment in Climate and Climate Change Effects in response to the Government's carbon targets. 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 that land use change may be necessary.
- The number of programmes that identified one or more collaborators were 50%, 73% and 30% for the three Challenge themes: Future Landscapes, Incentives for Change and Pathways to Transition, respectively. This was unchanged from the 3rd edition of the RLM for Future Landscapes, but higher for Incentives for Change (50%) and lower ($P < 0.05$) for Pathways to Transition (43%).
- The mean scores for the enablers of impact that were identified in the first research mapping exercise in 2016 (big data, building capacity, connecting with society, knowledge into action, and Vision Mātauranga) were like the third RLM for the Future Landscapes theme but decreased for the Incentives for Change theme (except for building capacity) and for Pathways to Transition theme (except for big data and connecting with society).

- Compared to the 2019 edition of the RLM, the number of programmes and level of investment that scored moderate to very high in likely contribution to the impact of the Challenge mission, increased for Future Landscapes and Incentives for Change themes, but was lower overall for programmes in the Pathways to Transition theme.
- The greatest funding source of high to very highly scored projects across all themes was SSIF. Govt-MBIE funding (Endeavour and Smart Ideas) accounts for the largest proportion of programmes that scored moderate or lower against the alignment to the Challenge mission. This is consistent with the second and third edition of the RLM, but contrasts with the first edition of the RLM which identified most of the investment in low to very low scored programmes as sourced from SSIF funds. This continues to indicate a strategic shift in CRI investment towards the Challenge mission, and a potential lack of alignment to the Challenge amongst MBIE-funded research.

1. Introduction

The Our Land and Water National Science Challenge (OLW-NSC, Toitū te Whenua Toiora te Wai) maintains a research landscape map (RLM) of existing research of relevance to the Challenge strategy¹. The Challenge has a statutory mission to **improve production and productivity of the primary sectors while maintaining and improving the state of our land and water resources for future generations**. We capture this mission in a vision which looks to a future where catchments contain mosaics of land uses that are more resilient, healthy, and prosperous than today. This is a future in which all New Zealanders can be proud of the state of our land and water and share the economic, environmental, social, and cultural value derived from te Taiao. Te Taiao is the environment that contains and surrounds us. It has four major components, Whenua (land), Wai (water), Āhuarangi (climate) and Kōiora (all living communities). It encourages us to aspire to a future where humanity and the natural world sustain each other in an interconnected relationship of respect.

To achieve our mission and vision the Challenge works under three interconnected themes with the following strategic areas:

Future landscapes

1. Be able to see what diversity is possible, and match land use to what it is suitable for.
2. Understand and model the management of land and water quality.
3. Provide the novel production systems that use healthy land and water to generate high-value products.

Incentives for change

4. Capture and share with the producers more of the value consumers associate with our products
5. Increase and share value based on mechanisms that reward sustainable land use and high-value products
6. Enable communities to identify and adopt sustainable land use practices

Pathways to transition

7. Increase our social capital so that we can have well informed debate about alternative futures

¹ <https://ourlandandwater.nz/about-us/our-strategy>

8. Act as kaitiaki, being responsible for our actions within enterprises, in a catchment and beyond
9. Manage pressures and remove the barriers to a transition

The specific aims of the RLM were:

- Obtain a snapshot of recent/current projects in each of the Challenge's themes
- Identify current level and sources of investment (2021 onwards)
- Determine relevance of each project assessed as the likelihood of impact aligned with the Challenge mission within 5-10 years.
- Track metrics to measure success and inform Challenge key performance indicators.
- Inform the process of identifying and filling research gaps through alignment and investment (first to third RLMs only).

2. Methodology

The 2022 Research Landscape Map followed the same methodology used in previous mapping exercises, completed by the Challenge in 2015, 2017, and 2019, to enable direct comparison between the data throughout the life of the Challenge. However, this acknowledges that there have been changes within the Challenge since 2015, including a revised strategy for the Second Tranche of the Challenge (2019 – 2024), and an underpinning mental model of Te Taiao (2020) to guide holistic research investment.

A total of 54 industry, government, NGOs, and research providers were contacted by email from the Challenge theme leaders and Chief Scientist in March 2022 and asked to complete a spreadsheet with the inputs listed below. Follow up emails and phone calls were used to prompt responses. Those organisations from which data was provided or were identified as research providers by others, are listed below. Several organisations responded to say that there were neither funding nor involved in research directly aligned to the Challenge mission, or that their research was led by a different provider who would respond.

Participants were asked to provide information on the following for each project that aligned with one or more of the three Challenge themes (Future Landscapes, Incentives for Change, Pathways to Transition):

1. Identifiers (name of research provider, project title, project leader, funding sources, collaborator details, and size of annual and total investment).
2. Timeline (start and end dates).
3. Objectives.
4. Achievements
5. A project's use (1 = very low, 5 = very high) of the enablers associated with the Challenge: Big Data, Building Capacity, Connecting with Society, Turning Knowledge into Action, and Vision Mātauranga (see Appendix I for more detail). Note that these enablers were introduced during the development of the Challenge's strategy for phase 1 and while not used in that or subsequent strategies, data on their importance have been maintained as some of them are still core to Government science policy (e.g., Vision Mātauranga).
6. The organisation's assessment of impact aligned with Challenge mission (1 = very low, 5 = very high).

Table 1. List of organisations from which data inputs were supplied.

Government	Industry	NGO	Provider
Department Of Conservation (DOC)	Agrilink	Waikato River Authority	AgResearch
Ministry for Primary Industries (MPI)	Ravensdown		ESR
Ministry For Environment	Synlait		GNS
Envirolink	Horticulture New Zealand		Lincoln Agritech
			Lincoln University
			Manaaki Whenua Landcare Research
			Massey University
			Land, Water, People
			NIWA
			Plant and Food Research
			Scion
			University of Otago
			University of Waikato
			Victoria University
			Land and Water Science
			Cawthron Institute

Additional notes to guide organisations in the input of data included:

- Projects were included in the mapping exercise if live during the 2021/22 financial year.
- Projects were not considered for inclusion if they were of lesser value than \$50k per annum.
- The magnitude of funding was calculated as total value for the project (and per annum). For on-going Strategic Science Investment Fund (SSIF)-funded projects, the end date was assumed to be June 30th, 2022. Funding sources were divided into: Government – via the Ministry for Business, Innovation and Employment (MBIE) and including Challenge funds; Government – via other sources including MPI's and Regional Council funds; Industry related funds such as the Foundation for Arable Research or the Fertiliser Association of New Zealand; Non-Governmental Organisations such as Forest and Bird; Commercial companies; University funds such as the Performance Based Research Fund; and other.
- If more than one theme was targeted, organisations were asked to concentrate funding into the most relevant theme.

Once collated, an additional assessment of potential programme impact aligned to the Challenge mission was made by the 5 members of the OLW Science Leadership team plus an independent assessor. The independent assessor filled a gap in expertise and had a strong working knowledge of the Challenge as a member of the Science Advisory Panel

Scores were analysed using the software product R with analysis dependent upon the question being asked below:

Is there evidence that the mean score for the enablers differ within and between themes?

- Analysed using ANOVA with the main effects as enablers and theme and their interactions. Pairwise differences interpreted as significant at the 5% level using the 'predictmeans' package.

Do the assessors average score differ to the provider score? Do the assessors scores differ based on the provider? and Do the assessors favour a theme?

- Analysed using linear mixed effects model (from the lme4 package) with the main effects being assessor, theme and provider, and their interactions as the fixed effects and project as the random effect. Pairwise differences interpreted as significant at the 5% level using the 'predictmeans' package.

The outputs from these analyses were used to ensure that the assessment of programme impact towards the Challenge mission and vision was consistent amongst assessors and adjust impact score if it was not. However, we recognise that the assessment is still subject to several caveats including the quality and level of the information supplied (i.e., was there enough to judge impact).

Information is presented at the theme level to allow comparisons with previous Research Landscape maps. Due to the large size of the Future Landscapes theme, programmes were also mapped (in the accompanying spreadsheet) into one of 10 categories: 1) Plants for production; 2) Animals for production; 3) Water allocation and irrigation efficiency and production benefits; 4) Climate and climate change effects; 5) Precision Agriculture and Horticulture; 6) Soil quality and erosion; 7) Water quality, limits and mitigations; 8) Farm systems; 9) Catchment systems and attenuation; and 10) Aquatic biodiversity and cultural values. Some additional programmes relevant to Soil quality and erosion and Water quality, limits and mitigations were coded into the Incentives for change theme. Impact to these categories was not assessed, but have been used by other stakeholders in the assessment of research strategies (McDowell et al., 2016).

Direct comparisons between the different editions of the RLM were made using a non-parametric Kruskal-Wallis test (due to skewed data) for the comparison of medians and a one-way ANOVA for the comparison of proportions.

3. Outputs

Table 1 shows the participants in the 2022 RLM. Although there were few responses from NGOs and industry/ sector organisations, a number did respond to the request to acknowledge that either they were not involved in aligned research, or else programmes they were involved in were led by another organisation/ research provider.

There was a high level of response from science providers, including two new providers from the last RLM (Aqualinc and Land, Water, People), providing confidence that we have captured the research being undertaken. The total number of programmes were 128, 30 and 20 for each respective theme. This compares with 119, 14 and 16 in 2019, 172, 22 and 32 for 2017, and 243, 51 and 66 in 2015.

Feedback from some participants suggested that they had difficulty in aligning some programmes to any theme and may have defaulted to Theme 1 (Future Landscapes) if in doubt.

3.1 Metrics

Generalised thematic-based metrics were derived for:

1. The magnitude of investment by source (e.g., industry vs government – MBIE vs CRI SSIF funds).
2. The degree of collaboration within a project to other groups.
3. The frequency and degree of assistance (scored 1 = very low to 5 very high by providers) that the enablers (Big Data, Building Capacity, Connecting with Society, Turning Knowledge into Action, and Vision Mātauranga) significantly contributed to the outcomes of a programme.
4. The likelihood that a programme has impact aligned with Challenge mission (scored 1 = very low to 5 very high by providers) as determined by the provider and independent assessors.

These metrics, set in 2015 and 2017 were intended to be used to indicate changes during the lifetime of the Challenge and assessed every two to three years.

The hypotheses were that over time, the degree of collaboration and use of Challenge enablers would increase, and that the magnitude and distribution of investment sources would change and become more aligned with the Challenge themes.

3.1.1 Investment

The total annual investment (\$106M) along with the relevant funding sources are given in Figure 1 apportioned by theme. In all themes the major source of funding was from MBIE (\$48M). Challenge funding as of December 2019 (counted as subset of MBIE funds) accounted for 7.8, 3.3 and 3.8M for themes 1 to 3, respectively. Crown Research Institute SSIF and other Government funding were also a significant source of investment in the Future Landscapes theme. When broken-down further, the majority of 'Govt – other' funding was sourced from the Ministry for Primary Industries associated with Climate Change research – largely carbon or nitrous oxide emissions from land to air. The study of these greenhouse gasses (GHG) is not within the scope of the Challenge, although adapting to climate change is.

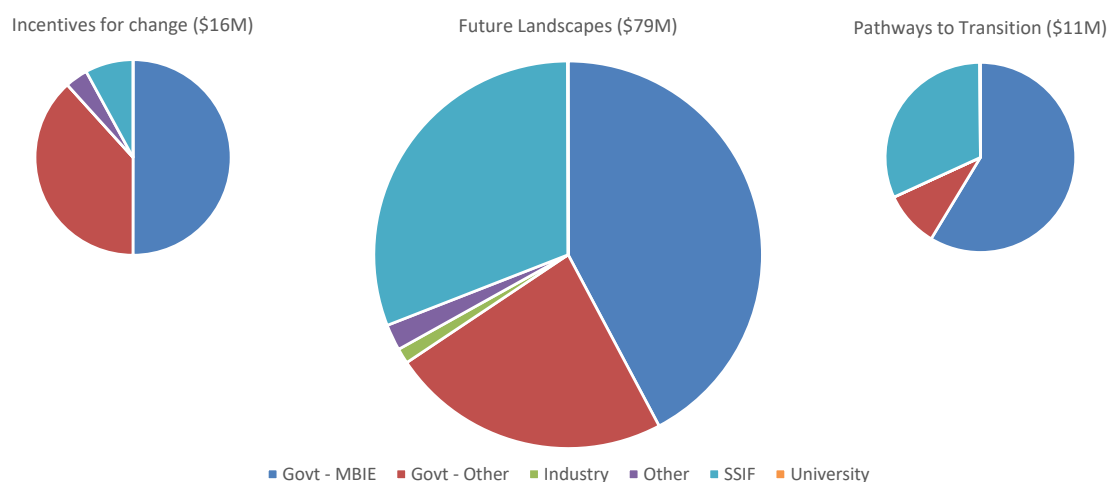


Figure 1. Total annual investment and funding sources apportioned to each theme. The size of the pie chart is indicative of the magnitude of annual investment.

Changes in funding across the four editions of the RLM are given in Table 2. Overall, while the quantum of funds decreased in the second and third RLM compared to the first; funds in the fourth RLM have rebounded. The greatest magnitude increase was evident in the funds from MBIE, while the greatest percentage increase was in the Government – Other (largely MPI) and Industry categories. Changes in the Govt-MBIE – probably reflect that these funds are not mission led and hence prone to fluctuations associated with competitive bidding. Decreases were noted in the Govt-Other and Industry categories between the second and third RLM which were expected as MPI’s Primary Growth Partnerships finished and transitioned to the newly established Sustainable Food and Fibres Future Fund. Substantial increases were noted in CRI SSIF funds between the second and third RLM. These funds are used strategically by the CRIs and largely directed to the changes likely under Government policy such as the National Policy Statement for Freshwater Management, which matured greatly in the 2017 update of the policy (Ministry for the Environment, 2020). Govt – Other funds have also been directed towards exploring these changes but have moved at a slower rate than SSIF funds, increasing between the third and fourth RLM

Table 2. Changes in major funding sources in each theme.

Theme / Funding source	First RLM 2015	Second RLM 2017	Third RLM 2019	Fourth RLM 2022	Percent change from Third RLM ¹
Incentives for change					
Govt - MBIE	\$3,811,755	\$6,664,399	\$2,995,000	\$7,880,299	163
Govt - Other	\$2,248,564	\$300,000	\$498,374	\$6,033,649	1111
SSIF	\$4,150,787	\$1,627,000	\$2,767,000	\$1,250,092	-55
Future landscapes					
Commercial	\$3,725,935	\$386,437	\$185,000	-	-
Govt - MBIE	\$25,481,363	\$36,721,719	\$37,159,106	\$33,408,489	-10
Govt - Other	\$14,301,246	\$11,379,226	\$5,683,827	\$18,473,430	225
Industry	\$11,392,523	\$14,121,711	\$1,496,904	\$10,126,664	577
SSIF	\$24,418,856	\$17,012,453	\$24,636,139	\$24,433,971	-1
Pathways to transition					
Govt - MBIE	\$5,064,322	\$5,179,418	\$5,539,603	\$6,438,369	16
Govt - Other	\$3,525,496	\$1,183,000	\$289,031	\$1,042,784	261
SSIF	\$2,483,374	\$1,172,198	\$1,510,000	\$3,483,900	131
Total	\$100,604,221	\$95,747,561	\$82,759,984	\$103457648²	31%

¹ Positive number indicates an increase in funding relative to the third RLM.

² Sum does not total to 106M as this includes funds outside of Govt and SSIF.

As a matter of consistency, we compared investments in the Future Landscapes theme by sub-topic from previous RLMs in Table 3. Shifts have occurred towards *Climate and Climate Change Effects* in response to the Government's carbon targets (Climate Change Commission, 2021). Other notable increases include *Soil Quality and Erosion* commensurate with efforts to better understand our soil resources, attributable to an increased interest in carbon dynamics and Government signals for regulating highly productive land (Ministry for Primary Industries and Ministry for the Environment, 2019). 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 that land use change may be necessary (McDowell et al., 2020).

Table 3. Sub-categorisation of the Future Landscapes theme for the four editions of the Research Landscape Map. Values in parentheses refer to research conducted in the Incentives for Change theme relevant to the sub-categories.

Theme 2 (sub-categorisation)	First RLM	Second RLM	Third RLM	Fourth RLM
1. Plants for production	13,238,035	9,354,915	4,198,935	3,346,806
2. Animals for production	6,769,818	730,049	358,818	3,733,000
3. Water allocation and irrigation efficiency and production benefits	11,601,115	6,800,908	4,716,844	4,639,638
4. Climate and climate change effects	5,691,937	3,808,890	3,023,664	9,503,105
5. Precision Agriculture and Horticulture	4,092,754	15,124,695	5,465,333	3,857,497
6. Soil quality and erosion	9,279,587	6,856,140	4,246,917	7,880,349 (9,062,840)
7. Water quality, limits and mitigations	8,396,896	17,305,828	20,203,671	10,396,919 (12,923,207)
8. Farm systems	10,310,954	6,061,566	2,713,321	16,350,755
9. Catchment systems and attenuation	6,295,175	9,827,131	12,089,890	10,870,752
10. Aquatic biodiversity and cultural values	5,550,984	4,168,515	13,316,334	8,503,610

3.1.2 Collaboration

The frequency and number of collaborators as indicated by each theme is given in Figure 2. By difference, the proportion of projects with no indicated collaboration was 50%, 27%, and 70% for Future Landscapes, Incentives for Change and Pathways to Transition, respectively. This was unchanged (Kruskal-Wallis $P > 0.05$) from the 2nd edition of the RLM at 43% for Future landscapes, but lower ($P < 0.05$) for Incentives for change (50%) and higher ($P < 0.05$) for Pathways to Transition (43%). Overall, the number of programmes with no collaboration (48%) was higher than the first edition of the RLM (23%). A greater understanding of the nature and number of collaborations could be

achieved through with more detailed interviews of the participants.

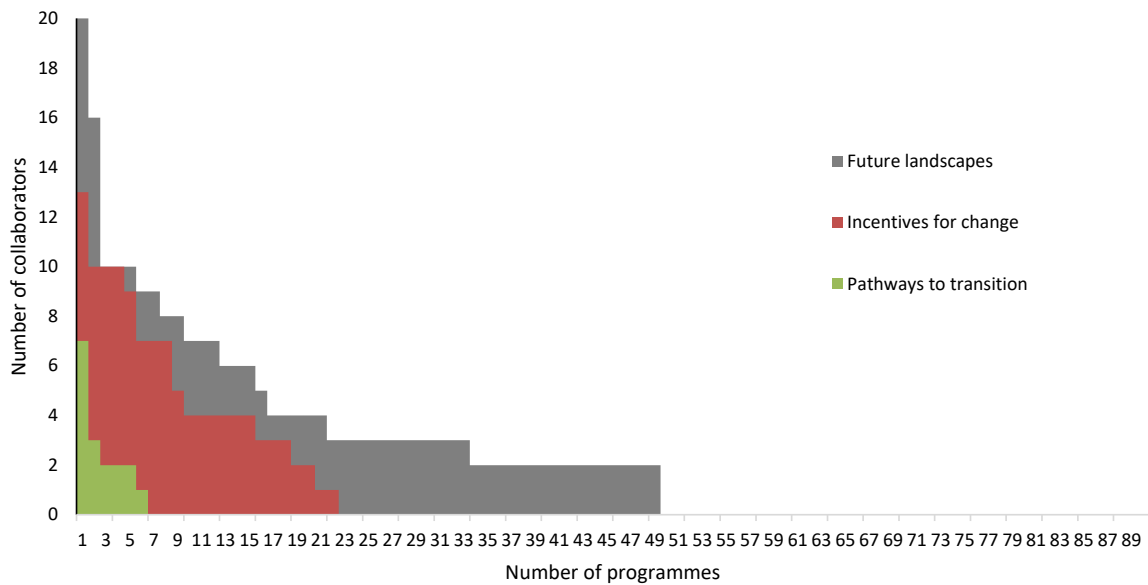


Figure 2. Histogram showing the number of collaborators within projects for each Theme as indicated by organisations.

3.1.3 Use of enabling themes

Providers assessed the relative importance of enablers to deliver outcomes for each research programme. A description of each of the enablers is given in Appendix I. Mean scores for each theme are given in Figure 3. Owing to the paucity of responses to enabling themes for Theme 3 (n = 5), a nonparametric Kruskal-Wallis was used to detect differences between median values for each Theme. A score of 3 (out of 5) is considered of moderate importance. This indicated that

- *Big Data* was ranked as more important in Theme 1 than Themes 2 or 3.
- There was no difference in the rank score for *Building Capacity*.
- *Connecting with Society* was ranked lowest in Theme 1, followed by Them 2 and 3.
- *Knowledge into action* was ranked highest in Theme 2.
- *Vision Mātauranga* was ranked higher in Themes 2 and 3 than Theme 1.

Compared to the previous RLM, mean scores for Future landscapes rarely changed, but decreased for all but *Building capacity* for Incentives for change and for all but *Big data and Connecting with Society* for Pathways to Transition (Table 4).

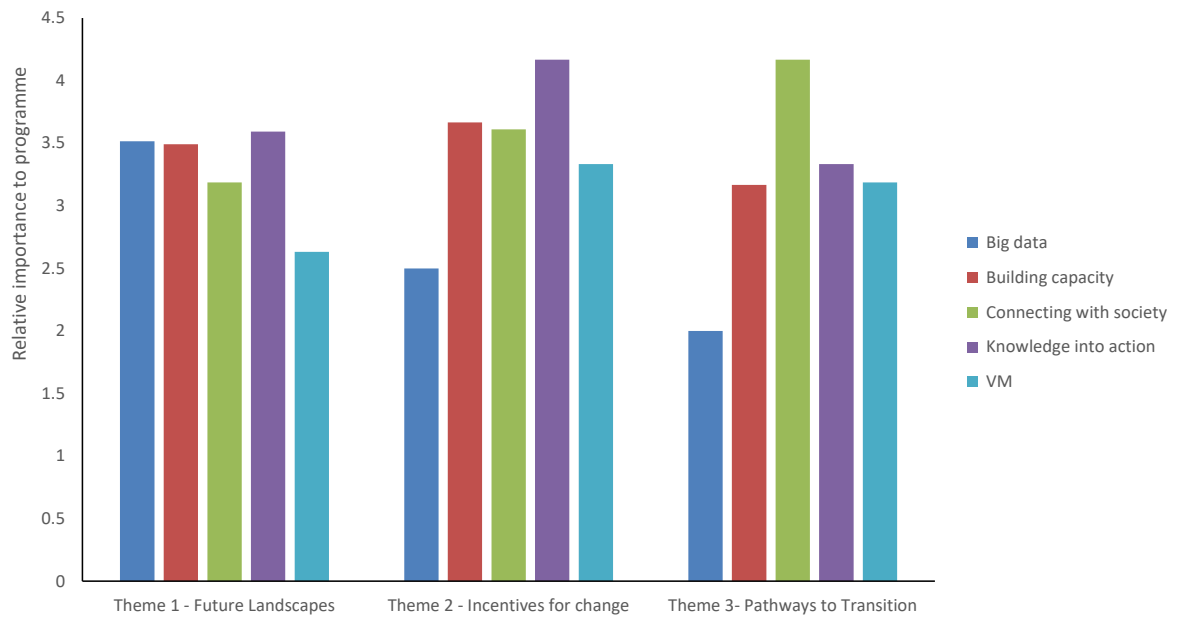


Figure 3. Relative mean importance of enablers to the delivery of outcomes for programmes in each theme.

Table 4. Relative importance, and in parentheses, the proportion of programmes that identified enablers as aiding in the delivery of outcomes in the third (2019) and fourth (2022) editions of the RLM. Significant differences between editions for importance are indicated by *P* values.

Theme	Edition	Proportion of programmes identifying enablers in aiding the delivery of outcomes				
		Big data	Building capacity	Connecting with society	Knowledge into action	Vision mātauranga
Future landscapes	2019	3.0 (53%)	3.5 (54%)	3.1 (53%)	3.8 (53%)	2.9 (50%)
	2022	3.5 (50%)	3.5 (51%)	3.2 (50%)	3.6 (50%)	2.6 (80%)
	Difference	ns	ns	ns	ns	<0.05
Incentives for change	2019	3.9 (54%)	4.0 (54%)	4.1 (54%)	4.6 (54%)	4.6 (54%)
	2022	2.5 (60%)	3.7 (60%)	3.6 (60%)	4.2 (60%)	3.3 (70%)
	Difference	<0.05	ns	<0.05	<0.05	<0.05
Pathways to transition	2019	2.2 (87%)	3.8 (87%)	4.0 (87%)	3.7 (87%)	4.1 (87%)
	2022	2.0 (20%)	3.2 (25%)	4.2 (25%)	3.3 (25%)	3.2 (75%)
	Difference	ns	<0.05	ns	<0.05	<0.05

3.2 Relevance assessments

To assess the likelihood that programmes will have impact aligned with the Challenge mission, scores for impact need to be adjusted for consistent over or under assessment. The collated outputs indicated that for all three Themes the scores provided by participating organisations were different ($P < 0.001$; usually greater) than those given by the independent assessors (Figure 4). Care should be taken in interpreting the results of the scores for individual organisations. Whereas some providers contributed a wide range of projects to the RLM, other providers were narrower in their focus. Where providers were more inclusive there are likely to be a larger number of projects that are less likely to have impact aligned to the Challenge mission, lowering the average score. Hence, a high or low average score should not be taken as a measure of the organisation's ability to deliver impact to the Challenge.

Owing to the bias in scores from providers we used scores from the independent assessors. However, because all assessors scored each programme, we were able to correct scores for any potential bias (Figure 4). Adjusted scores were used to filter programmes that were of moderate or greater likelihood of impact (i.e., scored ≥ 3). By Theme, the numbers of programmes of moderate or greater likelihood were 30, 7 and 8 for the Future Landscapes, Incentives for Change and Pathways to Transition themes, respectively. Data for investments in all projects according to adjusted likelihood is given in Figure 5. The annual level of investment for projects of moderate or greater likelihood was \$71M (out of \$128M), \$14M (out of \$30M), and \$6M for Future Landscapes, Incentives for Change and Pathways to Transition themes, respectively. Therefore, amongst the research programmes provided for this mapping exercise, there are \$37M, \$3M, and \$4M per annum spent on projects that are projected to have a low to very low likelihood of impact in one or more of the Challenge themes (Figure 6). That is not to say that the research is not of relevance, rather it has a lower alignment with the mission of Our Land and Water. The distribution of funding sources for high to very high scored projects differ to that seen in Figure 1 for total annual spend. The greatest funding source of high to very highly scored projects for all themes is SSIF, while Govt-MBIE accounts for the largest proportion of programmes scored moderate or lower. This is consistent with the second and third edition of the RLM, but contrasts with the first edition of the RLM which identified most of the investment in low to very low scored programmes as sourced from SSIF funds. This continues to indicate a strategic shift in CRI funds towards the Challenge mission, and a potential lack of alignment to the Challenge for MBIE-proposals.

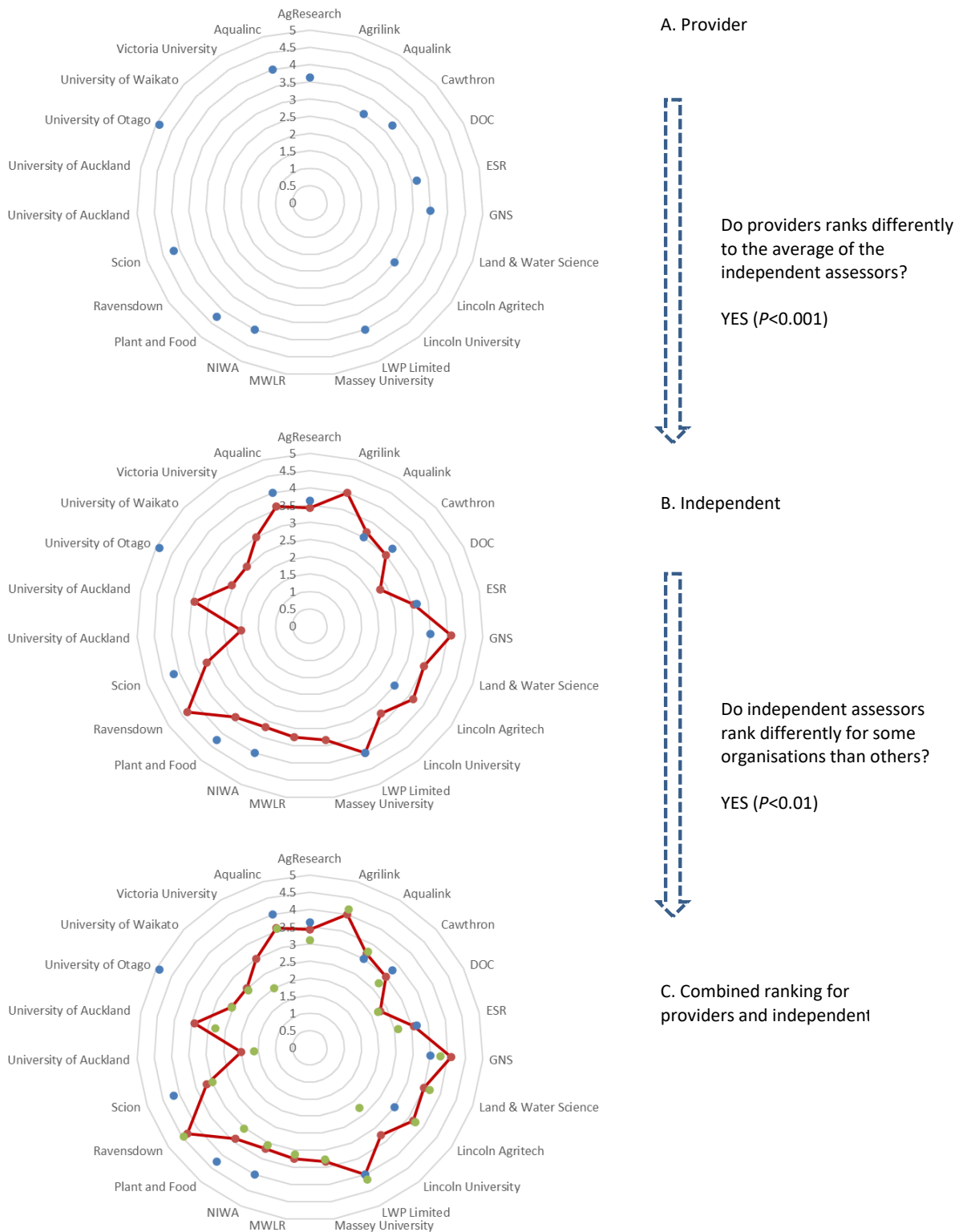


Figure 4. Mean scores for all programmes by organisation as contributed (A) (blue circles), (B) the independent assessors (red circles), and (C) for both after adjustment (green circles).

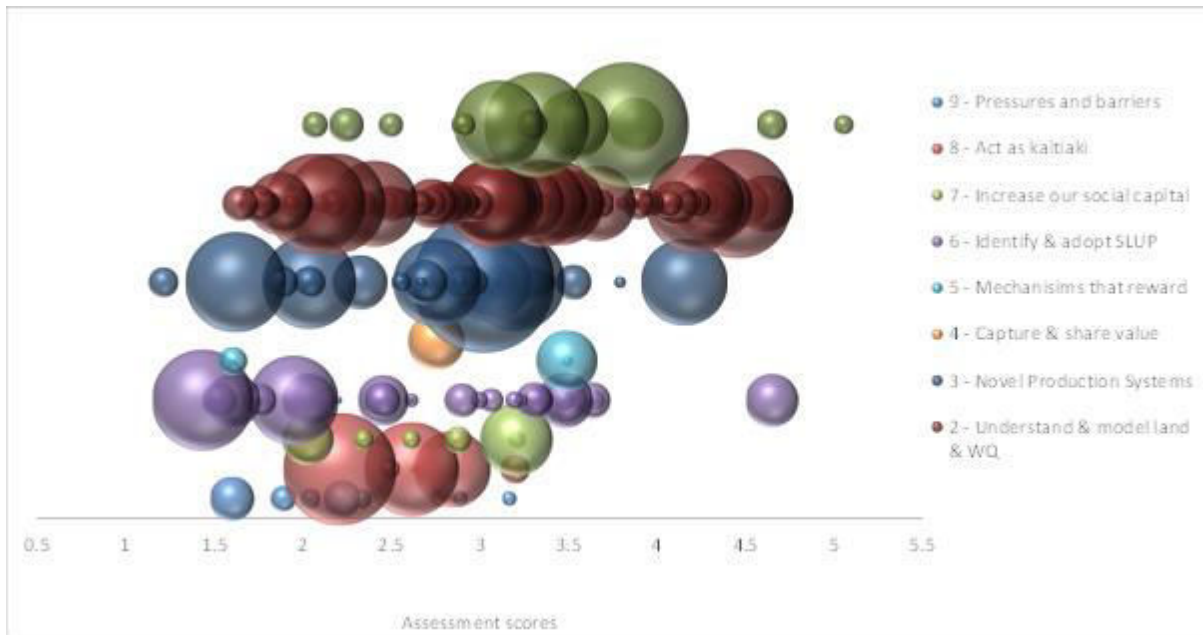


Figure 5. Assessment scores (horizontal axis) and the magnitude of investment for each programme (represented by the size of the bubble) according to their fit to strategic areas in the Challenge.



Figure 6. Mean proportional spend by theme and strategic area for moderate to very-highly scored programmes (top). The difference from the total annual spend gives the proportion spent on low to very low scored programmes for each theme. The high to very highly scored programmes are broken down further by funding source (bottom).

4. Discussion

The fourth and final edition of Our Land and Water National Science Challenge, Toitū te Whenua, Toiora Te Wai Research Landscape map has provided the final opportunity to map the aligned research that contributes to the gazetted OLW mission. Since the first mapping exercise in 2015, there have been shifts within OLW as to how the themes are described and the embedding of the mental model based on Te Taiao in 2020. However, it was considered important to retain the same methodology and questions that were used to assess impact of aligned research with the original Challenge mission to provide comparison over time.

While there are some limitations to the approach, in that the providers of the information are self-assessing to what degree their research contributes to the impact of the Challenge, as well as self-

scoring the identified enablers of that research, this bias has been mitigated through analysis and assessment provided in this report. Additional interviews with key providers or funders of aligned research could help build up a richer picture of shifts in collaborative behaviours, co-innovation approaches, and the contribution to overall outcomes and impacts of Challenge aligned research.

The four editions of the RLM provide a detailed picture of the types of research and funding sources over time that have aligned to and contributed to the overall impact of Our Land and Water.

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Appendix I

Harnessing the power of big data

This looks at the programme's ability to bring together heterogeneous and disparate data generated in science, practice, policy and society, into a dynamic, shared landscape of data that gets more widely used, is easily understood, integrated and analysed. It includes elements of data gaps and interoperability.

Capacity building

Capacity building explores the degree with which New Zealand scientists are participating in trans-disciplinary research teams and collaborative processes, building capability through the supervision of students, mentoring new staff or replacing existing staff.

Connecting with society

Many New Zealanders remain sceptical about the value of science. Connecting with society aims to build trust and raising awareness of the value of science to meet society's aspirations around freshwater quality and the social license to operate. It incorporates aspects such as communication via existing outreach and education programmes, digital tools and social media.

Working together to turn knowledge into action

Effective uptake of research is built on a platform of knowledge (local experiential, indigenous and scientific) exchange and co-development between research and stakeholders throughout the process of generating knowledge itself and not divorced from it. The collaborative approach we propose to take will build on this trust and increase the diversity of relationships we can draw on to turn knowledge into action.

Vision Mātauranga

Māori play an active role in the management of land and water resources across New Zealand. The use of VM recognises Treaty obligations, tribal development aspirations and research that is of clear relevance and impact for Māori.