

SCIENCE, INNOVATION & TECHNOLOGY

BRIEFING FOR INCOMING MINISTERS 2023

FROM THE INDEPENDENT RESEARCH ASSOCIATION OF NEW ZEALAND (IRANZ) REPRESENTING NEW ZEALAND'S INDEPENDENT RESEARCH ORGANISATIONS (IROS).



Independent Research Organisations (IROs) of New Zealand are highly capable contributors to the economy. They carry intellectual, material, and cultural capability, using science and related activities to develop and commercialise innovative technologies and solutions. New Zealand's IROs have impact across the spectrum from local communities to global markets, with ownership and governance independent of Government. IRANZ also provides an independent voice for Māori research organisations.

IRANZ members and associates employ over 1250 staff and have a combined turnover of around \$170 million p.a., with approximately \$75 million of research investment from Government and \$35 million from independent stakeholders - playing a key role in business expenditure on research and development (BERD) in New Zealand. The total IRO science infrastructure is approximately equivalent to two CRIs.

KEY POINTS

1. IROs are a vital part of the science, innovation, and technology (SIT) ecosystem and have a variety of community, philanthropic, and industry ownership models. They provide important targeted research and expertise in specific economic, environmental, and social areas not adequately covered by CRIs and universities. IROs can play a key role in the government's objectives in the SIT sector.
2. IROs are frequently part of "the best teams" required for important research programmes, either as lead organisations or as subcontractors for CRIs or university research programmes.
3. IRANZ was formed from The Research Associations Coordinating Committee, which had provided a forum for research organisations outside the DSIR including the Research Associations, Cawthron in Nelson (New Zealand's oldest research institute), The Ministry of Works Central Laboratory (now WSP Research and Innovation) and the NZ Institute of Agricultural Engineering (now Lincoln Agritech Limited).
4. Most IRANZ members are Public Research Organisations according to OECD and the (UK) Royal Society List of Public and Non-profit Research Organisations categories. The government should consider widening its definition of Public Research Organisations from its current restrictive categorisation which only includes Crown-owned organisations.



PromethION genome sequencer at the Bragato Research Institute.

5. Strategic investment in SIT capability and infrastructure should be available where appropriate to all research organisations, with baseline funding for organisations who are providing resources, knowledge, and supervision of PhD and post-doc researchers.
6. IROs have strategic capabilities that are unique in New Zealand, such as:
 - » Fire testing facilities and a structures laboratory capable of testing the resilience of up to three-story structures at BRANZ;
 - » Equipment for developing sustainable, alternate roading materials, bespoke monitoring equipment to aid resilience and disaster recovery, and a wind tunnel servicing international clients at WSP Research Laboratories;
 - » Cawthron's Shellfish Aquaculture and Seafood Safety Platforms working with MPI and industry to sustainability grow the sector and determine appropriate responses through research to ensure safety;
 - » Capability in wet fibre spinning at Lincoln Agritech. This enables the creation of textile quality fibres at small pilot scale for developing sustainable fibre technologies;
 - » Medical imaging using a high-tech GE 3-Tesla MRI machine and advanced software, at the Mātai Institute of Medical Research, based in Gisborne-Tairāwhiti, with research supporting kaupapa Māori and regional development;
 - » New Zealand's only licensed cell therapy manufacturing suite at the Malaghan Institute of Medical Research;
 - » Cutting-edge genomic sequencing technologies and analytical methods at the Marlborough-based Bragato Research Institute which are used not only in grapevine improvement, but for genomic sequencing for many other research organisations; and
 - » HERA's Fab4.0Lab, which is the leading industry4.0 fabrication research and training facility in Aotearoa.
7. Health IROs are playing a vital role in New Zealand's COVID-19 response. Malaghan Institute as a lead player in the Vaccine Alliance Aotearoa New Zealand and RNA Development Platform, and the Medical Research Institute of New Zealand (MRINZ) with clinical trials and public health initiatives, and by providing a regular report on the latest therapeutics for MBIE.



Preparing a subject for a detailed whole-of-body MRI scan to help scientists better understand child development and build models based on advanced imaging. Photo: Mātai Medical Research Institute.

8. Our Māori-led member organisations include Te Tira Whakamātaki, with a research focus on the environment, particularly biosecurity, pest management, and climate-related disasters; Takarangi Research, which is integrating SIT into vulnerable marae communities, rebuilding economic, environmental, and social resilience to climate impacts; and Taiuru Associates, which is addressing Māori ethics and Māori Data Sovereignty with regards to data, robotics, and AI.

9. SIT is an essential driver for New Zealand's future economic prosperity, the Government plays a vital role in investing in and promoting scientific research. The Government's SIT strategies, policies, and investment portfolios should consider impact across the entire research, science, innovation, and technology ecosystem, including IROs. This will be particularly important in the context of initiatives and changes arising from the government's SIT objectives.

1. INDEPENDENT RESEARCH ORGANISATIONS

Independent Research Organisations (IROs) of New Zealand are highly capable contributors to the economy with the ability to commercialise excellent research. The IROs listed below are independently owned and governed. They carry intellectual, material and cultural capability, engaging science and related activities in the ongoing development of innovative technology and solutions for our nation. New Zealand's IROs have impact across the spectrum, from local communities to global markets. IRANZ also provides an independent voice for Māori research organisations.

IRANZ members and associates employ over 1250 staff and have a combined turnover of around \$170 million p.a., with approximately \$75 million of research investment from Government and \$35 million from independent stakeholders - playing a key role in business expenditure on research and development (BERD) in New Zealand. The total IRO science infrastructure is approximately equivalent to two CRIs.

PRIMARY PROCESSING, FOOD SAFETY, AND THE ENVIRONMENT - KAI ME TE TAIAO

1. Aqualinc Research Limited
2. Bragato Research Institute
3. Cawthron Institute
4. International Global Change Institute (IGCI)
5. LASRA - The New Zealand Leather & Shoe Research Association
6. Lincoln Agritech Ltd
7. Digilab
8. Manawatū Agrifood Digital Lab Limited
9. Stoneleigh Consulting
10. Te Tira Whakamātaki

INFRASTRUCTURE, SOCIETY, AND THE ECONOMY - HANGANGA ME TE WHAKAHAERENGA

11. BRANZ - Building Research Association of New Zealand
12. Dragonfly Data Science
13. HERA - Heavy Engineering Research Association
14. ME Research
15. Motu Economic and Public Policy Research
16. Scarlatti - Evaluation Analytics and Insights
17. WSP Research and Innovation Centre
18. Xerra Earth Observation Institute
19. Mackie Research
20. Taiuru & Associates Ltd
21. Takarangi Research Group

HEALTH AND MEDICINE - HAUORA ME TE RONGOĀ

22. Malaghan Institute of Medical Research
23. MRINZ - Medical Research Institute of New Zealand
24. New Zealand Brain Research Institute
25. Gillies McIndoe Research Institute
26. Mātai Medical Research Institute - Te Mata Mātai Hura

Further information on each IRO is given in the Appendix.

IRANZ, PO Box 24390, Wellington 6142
T: 027 292 1050 // E: information@iranz.org.nz // www.iranz.org.nz

2. THE INDEPENDENT RESEARCH ASSOCIATION OF NEW ZEALAND

The Independent Research Association of New Zealand (IRANZ) represents the collective interests of these Independent Research Organisations in New Zealand.

IROs are a vital and unique part of the New Zealand Science ecosystem, IROs include the oldest (Cawthron) and newest (Te Tira Whakamātaki) research institutes in New Zealand.

IRANZ was formed from The Research Associations Coordinating Committee which had provided a forum for research organisations outside DISR including the Research Associations, Cawthron (New Zealand's oldest research institute), The Ministry of Works Central Laboratory and the NZ Institute of Agricultural Engineering at Lincoln.

Cawthron Institute was established in 1919 by the last will and testament of Nelson philanthropist Thomas Cawthron who had a vision – that science could contribute to the growth of a young New Zealand. Today their science is strongly focused on protecting marine and freshwater environments and supporting sustainable development of the seafood and aquaculture sectors. They are proud of the positive difference their research has made to the Tasman region and New Zealand's environment and economy since their establishment.

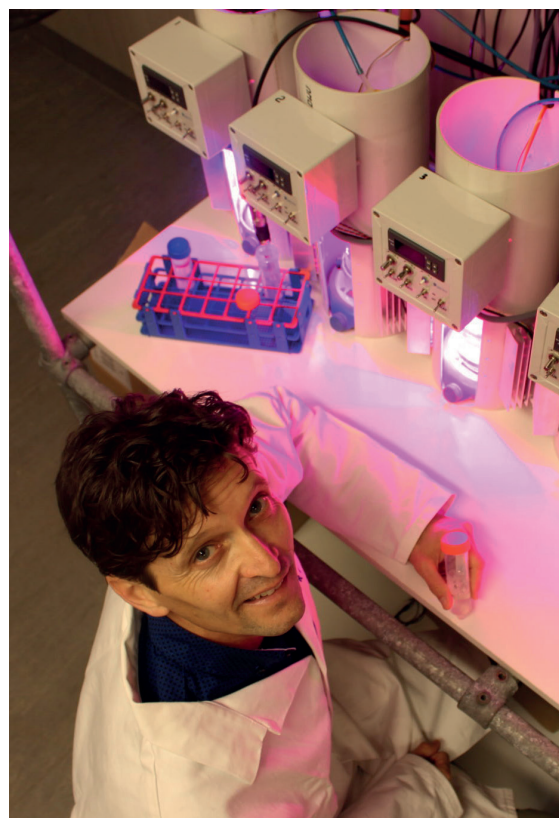
WSP history dates back 151 years as the Public Works Department later Ministry of Works, evolving into Opus, WSP Opus, and now WSP. WSP Research and Innovation Centre, based in Petone, is the largest research group in WSP - reaching out internationally through WSP's 66,000 global experts in 550 offices in 44 countries.

Lincoln Agritech was founded in 1964. Then known as the New Zealand Agricultural Engineering Institute (NZAEI), it was formed to undertake applied research to accelerate agricultural engineering innovation by New Zealand's primary sector. Lincoln Agritech has expanded to become a leading innovator for the agricultural, industrial, and environmental sectors. Many technology innovations developed at Lincoln Agritech have been adopted by the primary sector in New Zealand and internationally.

BRANZ, our largest Research Association, was set up in 1970 building upon the information resources of the Building Research Bureau and supported by the Building Research Levy. BRANZ now funds a multimillion-dollar research programme supported by the Building Research Levy in its own laboratories and through universities and other research organisation. It is also the home of the Building Better Homes, Towns & Cities National Science Challenge.

In recent years, IRANZ has welcomed several health research organisations. The Malaghan Institute provides high impact research into cancer treatments, covid vaccines, and the immune system. The Medical Research Institute of New Zealand has internationally recognised research programmes in numerous fields including asthma, cardiothoracic surgery, intensive care, medicinal cannabis, oxygen therapy, and stroke. Mātai Medical Research Institute, based in Gisborne-Tairāwhiti, is focused on medical imaging using new and advanced software, post-processing, and artificial intelligence. Gillies McIndoe's research team focuses on the treatment of many diseases, including vascular birthmarks, fibrotic conditions, and cancer. New Zealand Brain Research Institute specialises in neurodegenerative disorders (Parkinson's, Alzheimer's, Huntington's, and dementias) with both investigator-initiated research, particularly longitudinal research, clinical trials, and outpatient clinics conducted onsite.

IRANZ Māori-led member organisations include Te Tira Whakamātaki, with a research focus on the environment, particularly biosecurity, pest management and climate-related disasters; Takarangi Research, which is integrating SIT into vulnerable marae communities, rebuilding economic, environmental, and social resilience to climate impacts; and Taiuru Associates, which is addressing Māori ethics and Māori Data Sovereignty with regards to data, robotics, and AI.



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IRANZ Māori Caucus is convened by the IRANZ Kaitohutohu Mātauranga and comprises four IRANZ Māori members and Kaiārahi Māori from other members. IRANZ aims, through the Māori Caucus and the Ngā Mahi Ngātahi Project, to promote Equity, Diversity, and Inclusion and enhance understanding and approach to kaupapa Māori.

Motu Economic and Public Policy Research with IRANZ members Dragonfly, ME Research, Scarlatti, MAF Digilab and the International Global Change Institute help Kiwi decision-makers grapple with complex social and environmental issues, promoting well-informed debate on public policy issues. While IROs are all different, they are each structured in a way that enables New Zealand to benefit from high-impact research across business, the economy, the environment, and the community. IROs consistently provide quality science outputs that provide high-impact results for their stakeholders and New Zealand.

ECONOMIC IMPACT

IRANZ members and associates employ over 1250 staff and have a combined turnover of approximately \$170 million p.a., which includes \$40 million of research investment from Government and \$30 million of stakeholder investment. The total IRO science infrastructure is equivalent to two CRIs, with a stakeholder investment exceeding the Government's Strategic Science Infrastructure Fund (SSIF) investment in CRIs.

PLACE IN THE RESEARCH SECTOR

IROs are a key part of a thriving independent research sector that is a major pillar of the New Zealand science system, and a key to New Zealand achieving the goal of increasing business expenditure on research and development.

Many, but not all, IROs started with government support, normally backed by an industry group. This includes BRANZ and HERA, who both administer industry research levies, as well as the recently established Regional Research Institutes, such as Bragato and Xerra.

Other IROs have been established completely independently of Government support by researchers who have identified specific needs for high impact research, these include Motu, Aqualinc, M.E Research, and Te Tira Whakamātaki.

IROs often have excellent links to philanthropic funding, including Cawthron, the Malaghan Institute of Medical Research, the Medical Research Institute of New Zealand, Gillies McIndoe Research Institute and Motu Economic and Public Policy Research.

IROs play an important role in collaborative research programmes with universities and CRIs, where they provide important industry and sector linkages to the programme. Some 25% of the research undertaken at IROs is as subcontracts to CRIs or university programmes, with around 10% of the research led by IROs being contracted to other organisations. IRO Contribution to Strategic Science Infrastructures.

STRATEGIC SCIENCE INFRASTRUCTURES

The Strategic Science Investment Fund (SSIF) supports longer-term programmes of mission-led science and science infrastructure of enduring importance to New Zealand. Many IROs maintain such research and infrastructures, often without government support.

- » WSP Research is the only group in New Zealand undertaking international quality research and development into road materials. At their Lower Hutt Laboratory their Wind Tunnels tests have been used to evaluate everything from buildings and cars to airplanes and spaceships.
- » BRANZ fire research laboratory offers a full range of fire-resistance and reaction-to-fire tests for the building, construction, and other industries. When complete, a new laboratory will be able to burn whole houses and 3-story facades for research purposes. The recently commissioned Structures Laboratory is capable of research and testing of complex structures such as 3-storey high buildings or heavy-duty connections. Outdoor exposure sites across Aotearoa are used to prove durability and weathering aspects required for materials to be used in New Zealand buildings.
- » Cawthron's Aquaculture Park is the national centre of excellence for shellfish aquaculture research, development, and production. This world-class facility is home to seafood companies, education and training programmes, and New Zealand's largest mussel and oyster hatchery operations as well as the Shellfish Aquaculture Platform led by the Cawthron Institute in partnership with other researchers, MPI, and industry.
- » The Bragato Research Institute in Blenheim trials world-first technologies, conducts commercial trials, and undertakes research winemaking at a scale and degree of experimental control not possible before in New Zealand. Their cutting-edge genomic sequencing technologies and analytical methods are used not only in grapevine improvement, but for genomic sequencing for many other research organisations.

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- » The Malaghan Institute of Medical Research contains New Zealand's only licensed cell therapy manufacturing suite. This unit is Medsafe approved to manufacture cutting edge cell and gene therapies to support clinical trials. The Institute is also home to a world-class cytometry and imaging facility and biomedical research unit with more than 100 biological disease models to support their immunology and immune therapy research activities.
- » HERA is undertaking world leading construction industry research with their four-year Endeavour-funded research programme to develop Construction 4.0 - the uptake of smart technologies and data transformation of Aotearoa's construction sector and the incorporation of Mātauranga Māori. They continue their manufacturing and construction sectoral research leadership in developing low-carbon design guidance for low-storey building typologies. HERA is also one of only two international partners in Australian's ten-year Advanced Composite Manufacturing CRC, with projects relating to circular design, AI in fabrication, and composite connections.
- » Lincoln Agritech has established a unique in New Zealand capability in wet fibre spinning. This enables the creation of textile quality fibres at small pilot scale for the development of sustainable fibre technologies and first market evaluation of textiles made from novel fibres. This is currently used for research projects on regenerated biopolymer fibres from wool and cellulose and could be used on a wide range of fibre technologies. Wet spinning is being examined extensively internationally for the development of sustainable fibre alternatives to the environmentally problematic synthetic fibres that dominate the fashion and textile industry.

These nationally unique resources only exist because the IROs that maintain them are strong and financially viable. It is important to check that new policy initiatives will not undermine this viability.

IRO CONTRIBUTION TO REGIONAL DEVELOPMENT

A report by the New Zealand Institute of Economic Research (NZIER), *Impact of the Cawthron Institute: Economic contribution to Nelson and New Zealand*, showed that the Cawthron Institute has created a unique business model, adding value to the Tasman/Nelson region and national economies. It represents 25% of the Nelson business service sector's exports, contributes \$14m in added value to the local economy, and indirectly creates an additional 91 jobs. It has national and global reach, and its future successes could further boost New Zealand's GDP by \$200 million and create over 500 jobs.

The Bragato Research Institute (BRI) commissioned the NZIER to estimate the impact of research and development (R&D) in the wine sector, and the impact of Bragato Research Institute activities on the Marlborough region, the national winegrowing industry, and the wider economy. They found that BRI's contribution to the national economy is approximately \$8 million per annum, including the economic benefits from 30 new jobs created for the New Zealand economy. As part of that \$8 million, the creation of Bragato has boosted Marlborough's economy by \$2.2 million. Each year, wine R&D leads to an increase in exports by \$41 million, an increase in the size of the national economy by \$64.5 million, a boost in household consumption by \$37.2 million, and 258 new jobs for the economy.



The Grapevine Improvement team at the Bragato Research Institute is working on identifying epigenetic markers of environmental stress in grapevines – such as which genes react when the grapevine is in drought conditions or very cold weather. Photo: Bragato Research Institute.

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Mātai Medical Research Institute is a world-leading medical imaging research and education centre based in Tairāwhiti, Gisborne. In 2019, Mātai secured a \$6 million grant from Kānoa – RDU's Provincial Growth Fund (PGF), to purchase a state-of-the-art magnetic resonance imaging (MRI) scanner. In 2022, Kānoa – RDU awarded Mātai a further \$1.5 million grant and \$1.5 million loan through the Regional Strategic Partnership Fund to help co-fund the expansion of Mātai Medical Research Institute. Mātai has become a prominent force in medical imaging, using a high-tech GE 3-Tesla MRI machine, surrounded by a team of experts and collaborations with academic and industrial partners. Mātai is positioned as a leader in the field of medical research, driving innovation, and making a lasting impact on healthcare, education, and economic outcomes. Partnerships with the community are enabling advances in community health and the development of local talent and inspiring Aotearoa's tamariki and rangatahi. Plans are underway for the development of a campus of research and education excellence.

HEALTH RESEARCH IROS

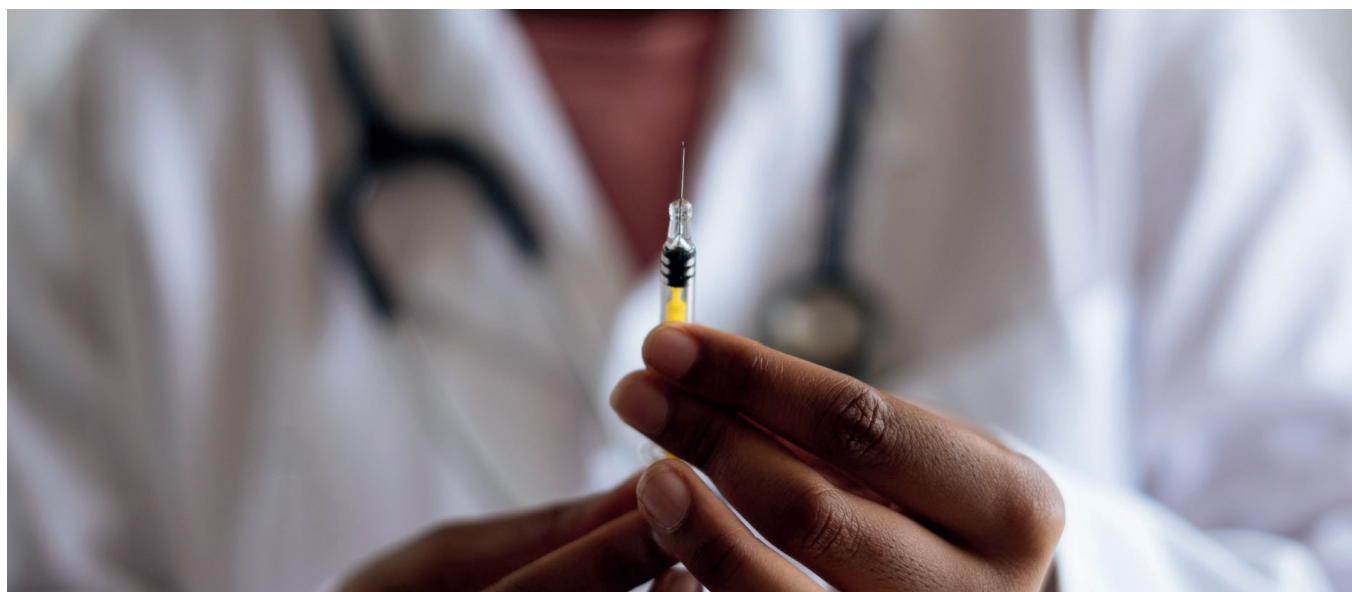
Health focused IROs include the Malaghan Institute, the Medical Research Institute of New Zealand, Mātai Medical Research Institute, Gillies McIndoe Research Institute, and the NZ Brain Research Institute. These IROs are dedicated to investigating the causes of important public health problems, including cancer and asthma, in New Zealand and internationally. They have led the way in New Zealand research for COVID-19 vaccines and treatments. They use their knowledge to support the prevention and treatment of a number of diseases and provide a base for specialist training in medical research. This research is partially supported by the Health Research Council. Other research includes new drugs, drug repurposing, or medical appliances that could be developed by New Zealand firms and provide economic and other health benefits for New Zealand.

In 2020, Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo (VAANZ) was established as part of the Government's COVID-19 vaccine strategy, led by the Malaghan Institute of Medical Research, in collaboration with the University of Otago, Victoria University of Wellington, and a number of local and international collaborators. In two years, VAANZ has designed and manufactured a novel COVID-19 vaccine candidate – Kiwi Vax – that is safe and effective in preclinical models and was developed at a fraction of the cost of commercially-developed vaccines.

A study conducted by the Medical Research Institute of New Zealand (MRINZ) examined the long-term symptoms of COVID-19 cases in the Greater Wellington region of New Zealand. The study focused on a cohort of 2020 alpha/beta variant community COVID-19 cases and looked at both the physical and mental health of the participants almost two years after their illness.

The Gillies McIndoe Research Institute's ground-breaking research in strawberry birthmarks has potentially enormous implications for the treatment of other tumours, including cancer.

Mātai's strong performance has attracted significant interest from New Zealand's wider research community, as well as international research entities. This has resulted in numerous additional research projects and programmes collaborating with Mātai, including drug addiction, prostate cancer, and ADHD.



A preclinical study evaluating a Kiwi-made Covid-19 vaccine – Kiwi Vax – has shown its unique formulation induces a safe and highly effective immune response to SARS-CoV-2 variants of concern, making it a promising booster vaccine candidate.

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IRO ENGAGEMENT WITH NATIONAL RESEARCH PRIORITIES

The eleven National Science Challenges (NSCs) were designed to focus New Zealand's research on large and complex issues by drawing scientists together from different institutions and across disciplines to achieve a common goal through collaboration.

The Building Better Homes, Towns and Cities NSC was hosted by an IRANZ member, BRANZ, with Motu and WSP Research involved in research projects. IRANZ members were also involved in several other NSCs, including Cawthron Institute researchers playing an active part in Sustainable Seas, Land & Water, Biological Heritage, Science for Technological Innovation, and High Value Nutrition NSCs, Lincoln Agritech was involved in the Deep South NSC, Mackie Research was involved in the Healthier Lives NSC, and WSP Research was also involved in the Resilience to Nature's Challenges NSC.

As the NSCs are in the process of winding down, IRANZ assumes the funding from these activities will be returned to the Science and Innovation Vote for distribution using the existing mechanisms.

IRANZ is pleased to see Climate Change (mitigation and adaptation) and Disaster Resilience being developed as a multi-institutional Research Hub. If the Government considers similar methods for national research priorities in the future, Big Data is another subject that could warrant attention. There are IROs well placed to take an active role in both Climate Change and Disaster Resilience, as well as Big Data.

OTHER ACTIVITIES OF IRANZ

IRANZ represents the collective interests of its members by undertaking activities to create a positive operating environment for the Independent Research Organisations in New Zealand. These activities include:

- » Providing a forum for IROs to discuss matters of common interest;
- » Providing an IRO point-of-contact for Ministers, MBIE, and other governmental science investment agencies;
- » Raising the profile of IRANZ and its members with the Government (and their advisors) and the research community (partners);
- » Developing IRANZ policy positions on key issues, and advocating to Government on issues that are important and where there is a clear collective requirement;
- » Sponsoring the Royal Society Speaker's Science Forum and other activities to promote science in the community; and
- » Disseminating news and success stories from IROs that demonstrate the wide impact of our members' work by means of our email newsletter *Connections* (published six times per annum) and our website.



Researchers at Aqualinc have been considering how the multi-layered impacts of climate change may require variations to future water allocation, as well as how long-term water management strategies can minimise the impact on the New Zealand economy while protecting its water and land quality. Photo: Aqualinc Research.

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3. GOVERNMENT POLICY AND MBIE ENGAGEMENT

As SIT is an essential driver for future economic prosperity, **the Government plays a vital role in investing in and promoting scientific research**. History, both here and in other countries, has shown that SIT will be supplied below the socially optimum level if left to market forces.

STRATEGY FOR RESEARCH, SCIENCE, AND INNOVATION

The draft *Strategy for Research, Science and Innovation*, outlines how New Zealand's research, science, and innovation system consists of a combination of people, institutions (including research organisations and businesses), and infrastructure. Independent Research Organisations are a vital and significant part of that system. IROs have been established to support areas in the system that are not adequately served by universities and CRIs.

The IRO diversity of organisational structures, governance arrangements, research foci, and access to funding, e.g., philanthropy, community, and industry, enhances the current and future role of the RST&I system.

It is important that the Government's research investment portfolio recognises this, and the impact of science policies on IROs is assessed during their development. Although IROs are not Crown owned, many are community owned and are just as vital to the New Zealand research infrastructure. New RSI strategies, initiatives, and policies should take into consideration impact across the entire research, science, and innovation ecosystem including IROs. This will be particularly important with any changes arising from Te Pae Kahurangi (CRI Review), and any new Research, Science and Innovation Strategy.

The current focus of the White Paper on Crown Owned Entities (CRIs and Callaghan Innovation) will constrain the contribution of IROs to the Government's vision of Te Ara Paerangi. Many IRANZ members are Public Research Organisations according to OECD and the (UK) Royal Society List of Public and Non-profit Research Organisations categorises and the government should consider **widening its definition of Public Research Organisations from its current narrow categorisation which only includes Crown-owned organisations**.

STRATEGIC SCIENCE INVESTMENT FUND

The Strategic Science Investment Fund (SSIF) programmes are structured around science platforms. A science platform is a combination of people, facilities, information, and knowledge that provide a particular, ongoing science and innovation capability for New Zealand. While Cawthron, LASRA, the Malaghan Institute, and the Medical Research Institute of New Zealand receive SSIF investment, all IRANZ members are keen to be part of contributing to a larger-scale research infrastructure that supports enduring priorities and a high-performing science system. The SSIF platforms should be provider agnostic and focus on best teams' capabilities.



WSP Research is assessing holey temporary traffic signs to improve their resilience in strong winds. The theory being tested is that wind will pass through the holes – meaning the signs will experience less wind load and be less likely to blow over. Apart from school patrol lollipops, perforated signs aren't used in New Zealand. Photo: WSP Research.

ENDEAVOUR FUND

Contestable research is a fundamental part of the New Zealand research, science and technology environment, but over the years this investment has been eroded by new initiatives (e.g. Strategic Science Investment Fund and National Science Challenges). The renaming of contestable funding to the Endeavour Fund, the focus on impact as well as research excellence, and the broader strategic direction are all welcomed initiatives for contestable funding. The focus on impact is increasingly important, and the fund also needs to take a broad, rather than an academic, view of Research Excellence.

Current success rates of around 15% on Endeavour and other contestable research funding are very low and a lot of valuable research effort is wasted and career precarity for research professionals is increased. **It is time for a major review of the contestable funding processes.**

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T: 027 292 1050 // E: information@iranz.org.nz // www.iranz.org.nz

As noted, contestable funding was eroded by mapping monies to Strategic Research and National Science Challenges, this caused a rapid increase in competition for this investment. Available funding was then further eroded by the COVID-19 crisis. The impact on IROs, particularly those that do not receive Strategic Funding, was severe. **IRANZ looks forward to monies mapped to the NSCs being returned to the Endeavour Fund.**

New Zealand can only gain from increasing its investment in the Endeavour Fund for high-impact and excellent research. New Zealand must do this if it wants to achieve a high-performing economy, world-leading social well-being, protection for the environment, and an efficient 21st century infrastructure.

BUSINESS AND ENTERPRISE RESEARCH AND DEVELOPMENT

The National Science Investment Strategy seeks to grow business and enterprise expenditure on research and development (BERD) to well above 1% of GDP. It sees this as driving a "thriving independent research sector that is a major pillar of the New Zealand science system". IRANZ members are excited to be part at this new growth area for New Zealand's research.

A number of IROs are built around Industry Levies: collective investment by business and enterprise in R&D and other collaborative activities. IRANZ sees IROs as being ideally placed to help increase BERD, whether they are structured as businesses or trusts, and whether or not they are supported by industry levies. It is important that policies are structure and funding neutral.

4. SPECIFIC ENGAGEMENTS WITH MBIE

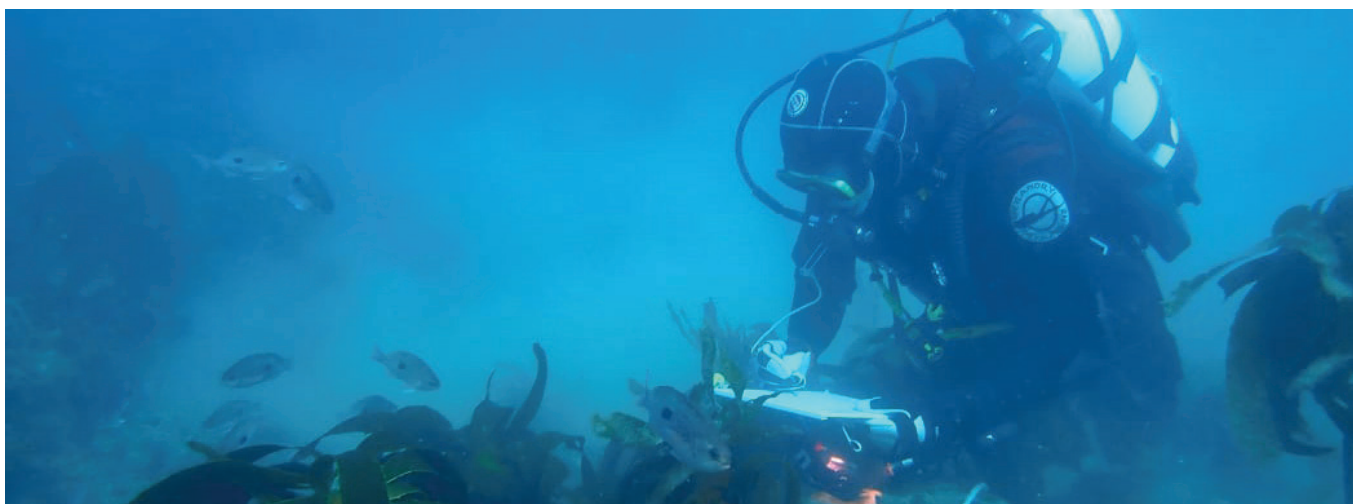
EARLY CAREER RESEARCHERS INITIATIVES

IRANZ appreciates the opportunity to engage with MBIE to support and assist with the development of the Applied PhDs and other initiatives announced in the budget. New Zealand needs to offer more secure job prospects for Early Career Researchers to allow them to develop the skills and knowledge needed to advance this country. Budget 2023 supports research fellowships and more PhD students with the skills needed to advance the New Zealand economy. This is welcomed by IRANZ members, many of whom are currently supporting PhDs both in-house and in universities. Too often research organisations must go offshore to find early career researchers with the skills and experience they need. **It is important that co-supervision is encouraged and that supervision costs are adequately shared between universities and the co-supervising research organisations.**

WELLINGTON SCIENCE CITY AND MULTI-INSTITUTION RESEARCH HUBS

The Wellington-based hub focused on health and pandemic readiness already involves IRANZ members the Malaghan Institute and the Medical Research Institute of New Zealand. The Gillies McIndoe Research Institute is also centrally located in the Newtown - Te Aro - Kelburn Health Research Corridor and could become part of this hub. The creation of the hub and the associated infrastructure focused investments would foster collaboration amongst Wellington Health Researchers.

Independent Research Organisations involved in environmental and infrastructure research such as BRANZ, WSP Research and Innovation, Cawthron Institute, Te Tira Whakamātaki, and Mackie Research look forward to participating in the Climate Change and Disaster Resilience Research Hub.



Cawthron coastal environmental scientist Ross Sneddon surveying Pania Reef. Photo: Scott Edhouse, Cawthron Institute.

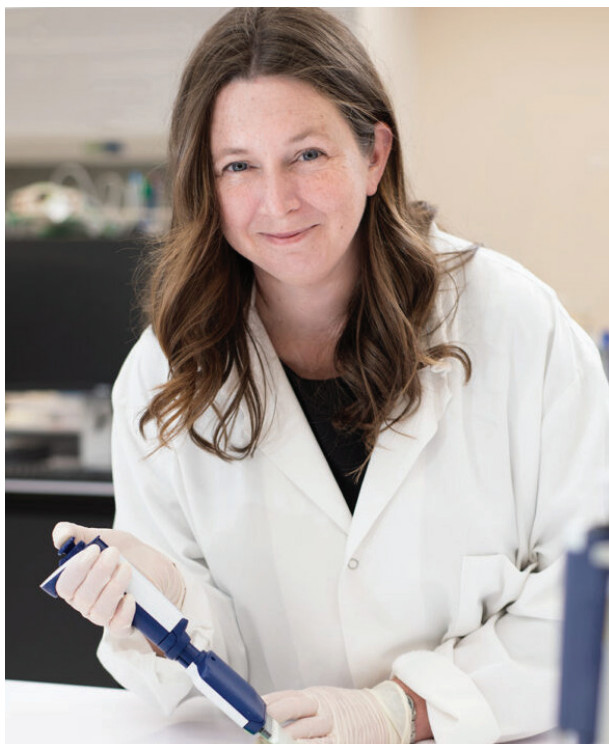
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ABOUT IRANZ



IRANZ, an association of independent research organisations, was formed to promote communication both among member organisations and to wider interest groups on the valuable science and research being undertaken by our member organisations. We actively pursue common interests, especially issues that affect government-research funding and member access to funding. IRANZ was formalised as a non-profit incorporated society in 2009.

IRANZ provides a variety of valuable services to members, including a presence in Wellington and the opportunity to share common concerns with similar organisations across New Zealand. IRANZ has a Wellington-based Executive Officer who works with the IRANZ Executive to keep members abreast of new developments in Government and its agencies; and to educate policymakers about the contributions of independent research organisations to innovation and economic development in this country. As a representative organisation in the science sector, Government ministries and agencies often seek IRANZ engagement and feedback.

IRANZ member organisations make vital contributions to a broad range of scientific fields, and offer an important complement to university-based and Crown Research Institute research. Our members' organisational size and flexibility often provide an environment that is particularly conducive to innovation and end-user engagement.

For membership enquiries, please email: information@iranzt.org.nz

OUR MEMBERS

Primary Processing, Food Safety, and the Environment/ Kai me te Taiao



Aqualinc aids world-class water management through scientific and policy research, technology development and deployment, and water management advisory services. Their research contribution is focused on groundwater (the quantity and quality of water stored and flowing beneath the land-surface), irrigation, and strategic water management. Aqualinc is the leading independent provider of irrigation expertise across the policy-to-practice spectrum of the water sector.



The Bragato Research Institute (BRI) drives innovation for the wine industry - from blue sky research through to the application of science in vineyards, wineries, and supply chain. A subsidiary of New Zealand Winegrowers, the national industry body for growers and wineries, their state-of-the-art research winery at the Nelson Marlborough Institute of Technology partners with industry and other research organisations to research, trial technologies, conduct commercial trials, and connect educators and students.



Based in Nelson, **Cawthron Institute** is New Zealand's largest independent science organisation, offering a broad spectrum of services to help protect the environment and support sustainable development of primary industries. Cawthron is a diverse organisation employing more than 275 scientists, laboratory technicians, researchers and specialist staff, with expertise in aquaculture research, marine and freshwater resource management, food safety and quality, algal technologies, biosecurity, and analytical testing.



The **International Global Change Institute (IGCI)** is a team of climate change and risk assessment experts with projects in over 60 countries, including China, Australia, Africa, the Middle East, and the US. With team members who were part of the 2007 UNFCCC (United Nations Framework Convention on Climate Change) Nobel Peace Prize, solid science underpins IGCI's training and climate and risk assessment data products and software. CLIMsystems, the commercial side of IGCI, is a member of the Climate Technology Centre & Network, the operational arm of the UNFCCC Technology Mechanism.

DigiLab *

Formed in late 2023 from Verum Group's bioacoustics monitoring team, **DigiLab** is an artificial intelligence company focused on bioacoustics and ecology. There is a global need to monitor animal populations and quantify biodiversity. DigiLab is the world's first bioacoustic laboratory working in a similar way to a genetic lab, where an acoustic diversity sample is collected by the user and sent to the laboratory for analysis. This laboratory is currently using New Zealand as a testing ground, with bioacoustic studies of great spotted kiwi/ roroa and other native species. They intend to extend the technology to the rest of the world.



A Māori environmental not-for-profit with a research focus, **Te Tira Whakamātaki** ('the watchful ones') is the voice for Māori communities concerning environmental and conservation issues, and research and policy-making in the biological security sector. They aim to keep Māori informed about biosecurity issues, research, and policy in New Zealand, and to include indigenous knowledge in biosecurity research and responses.



LASRA is the leading research and technology provider to the hide, skin, leather and footwear manufacturing sectors in New Zealand and Australia. They engage in research from the farm to the consumer and provide technical support to exporters. LASRA is the major provider of safety footwear testing services in Australasia. LASRA is a registered Private Training Establishment operating courses in leather manufacturing technology.



The **Manawatu AgriFood (MAF) Digital Lab** is a solution-focussed research centre developing and applying advanced technology within the primary production, agricultural, and food supply chain. The group unites and leverages diverse capability in precision agriculture, primary production science, horticulture supply chains, sensor technology, robotics, AI and data science. From small businesses to innovators, MAF Digital Lab develops agritech solutions to help their clients gain a competitive advantage in the global agri-business landscape.



Stoneleigh Consulting is a research company focussed on agricultural engineering, precision agriculture, remote sensing, AI, and machine learning applied to high-value crop production systems. They undertake research for MBIE Endeavour and MPI Sustainable Food and Fibre Futures Programmes. Stoneleigh holds a number of commercial contracts in data analysis, algorithm development, AI, and machine learning - oriented towards remote sensing, airborne hyperspectral surveys and laboratory-based hyperspectral analysis.



Lincoln Agritech is an independent, multidisciplinary R&D company owned by Lincoln University. Lincoln Agritech has capability in: groundwater research to manage water quality and quantity; precision agriculture for sustainable primary production; new materials science; biotechnologies; smart sensor and measurement technologies utilising microwaves, radar, and machine vision; green tech; and IRRICAD - software for designing pressurised irrigation systems.





The **Building Research Association of New Zealand (BRANZ)** is an independent science-led organisation. They use research, systems knowledge and their broad networks to identify practical solutions that improve New Zealand's building system performance. BRANZ are driven by the knowledge that to thrive as a society, New Zealanders need a built environment that is safe, healthy, and performs well.



Dragonfly Data Science is a growing science consultancy offering tailored data science, machine learning, statistical analysis, and reproducible reporting to clients in Aotearoa New Zealand and globally. Recent work includes digital production of the 2021 RSI system performance report, modelling the Antipodean albatross population, large-scale forest management using satellite imagery and machine learning, and monitoring shellfish populations on northern beaches.



Heavy Engineering Research Association (HERA) is a non-profit association driving research and innovation for the heavy engineering and steel industry across Aotearoa. They're focused on helping their members and wider industry look forward and be prepared for the future. Delivering solutions, developing and maintaining a skilled work force, and connecting and inspiring so industry is supported in technical excellence and knowledge transfer, have the right skills for their needs, and are a community engaged and united.



M.E Research specialises in ecological economics, focusing on the interface between the economy and the environment, and how these systems interact and influence each other. M.E Research work, which is applied at national, regional, and local government levels, includes ecological economics, natural resources, climate change, hazards/disasters, and regulation. Work includes sector specific studies for central and local government, and industry on development impacts or testing regulation effectiveness.



Motu Economic and Public Policy Research is an independent, public-good focused economic and policy research institute. They help Kiwi decision-makers grapple with complex social and environmental issues. It promotes well-informed debate on public policy issues. Areas of research include climate change, environmental regulation, emissions trading, water quality, housing, productivity, labour and population, infrastructure, and evaluation of national wellbeing.



Since 2004, **Scarlatti's** team of specialists have used research, evaluation, analytics, and insights to give clarity to the complex and hard-to-measure. Scarlatti specialises in the primary industries and tertiary sector while also working across a broad range of other contexts. For Scarlatti, it's about turning quantitative and qualitative research into action and working closely with clients to enable them to understand their impact, make sense of the numbers, and make decisions with confidence.



WSP Research and Innovation Centre provides a broad range of high quality research, specialist consultancy and laboratory services to improve the design and performance of infrastructure for commercial and government clients. Their researchers work in multi-disciplinary teams to address challenges as diverse as transportation safety, road performance, and the resilience of communities and businesses to major natural hazards.



Based in Alexandra, **Xerra Earth Observation Institute** is an independent Regional Research Institute focussed on Earth observation (EO) and remote sensing. Xerra's projects tackle complex problems through the application of EO data. Xerra is working closely with its peers, industry, and government to unlock the benefits from satellites passing overhead to monitor our land and sea. Xerra are the developers of Starboard, a maritime domain awareness platform. Starboard is helping governments and organisations tackle critical issues ranging from illegal fishing detection to assessing vessels for Covid-19 and biosecurity risks.

Mackie Research specialises in human systems research and consultancy projects. They have specialist expertise in transport (road safety systems, active transport, schools, user-friendly transport infrastructure and systems, health and transport); human systems and ergonomics (equipment evaluation, workplace systems, urban systems, sport & recreation, biomechanics, high performance sport, technology usability); and evaluations of interventions, programmes and initiatives in the transport, sport & recreation, and health sectors.

Led by Dr Karaitiana Taiuru, **Taiuru & Associates Ltd** is a boutique kaupapa/ mātauranga Māori research and advisory company, with specialist skills in Māori ethics with regards to data, robotics, and AI, and Māori Data Sovereignty (Digital and Genetic) and implementation. They also have expertise with Māori Intellectual Property Rights, cultural safety, Te Tiriti, and governance. With a wide-range of research and government clients, work includes tikanga, mātauranga, and cultural analysis.

Takarangi Research focuses on social science research to support local indigenous communities (tribal marae) and their re-engagement with ancestral resources to improve Māori well-being nationwide. Takarangi is set up under the Te Potiki National Trust. Te Potiki is a not-for-profit trust that has the marae of Aotearoa as its beneficiaries and will respond to individual marae. Te Potiki are connected to Māori Maps, which helps to connect Māori descendants with their marae and ancestral identity.

Health and medicine/ Hauora me te rongoā



The **Malaghan Institute of Medical Research** is New Zealand's world-class independent biomedical research institute with a focus on breakthrough discoveries in immunology and immunotherapy.

Based in Wellington, cutting-edge research and clinical trials are advancing our understanding of the immune system and its relationship to human health. The Malaghan Institute is a registered charity, with more than 130 researchers and support staff working on research programmes across cancer, allergy and inflammation, and infectious disease.



The **Medical Research Institute of New Zealand** (MRINZ), based in Wellington, is an independent medical research organisation with over 60 staff. They investigate the causes of important public health problems, and use this knowledge to improve the prevention and treatment of diseases, and to provide a base for specialist training in medical research. MRINZ has research programmes in numerous fields including asthma, cardiothoracic surgery, intensive care, medicinal cannabis, oxygen therapy, and stroke.



Originally focussing on Parkinson's disease, the **New Zealand Brain Research Institute** has grown to include studies and clinics for other conditions, including Huntington's and multiple sclerosis, and the normal functioning of the brain. The Institute also provides valuable research opportunities for many students and researchers from partner institutions, such as the University of Otago, University of Canterbury, and Te Whatu Ora - Waitaha Canterbury. It also works closely with partner community organisations, such as the Multiple Sclerosis and Parkinson's Society.



The **Gillies McIndoe's** research team focuses on the treatment of numerous diseases, including vascular birthmarks, fibrotic conditions, and cancer. The team is internationally recognised for their ground-breaking work, which spans in vitro methodologies, molecular biology, proteomics, metabolomics, and drug development through to physiology, clinical trials, and novel organoid models. They aspire to turn scientific discovery into therapies and strategies that help people prevent or manage prevalent diseases.



Mātai, based in Gisborne-Tairāwhiti, is focused on medical imaging using new and advanced software, post-processing, and artificial intelligence. They take a collaborative approach, drawing on a network of leading expertise nationally and internationally. Their research supports kaupapa Māori and their community toward a better understanding of a healthy brain, heart, and body with the goal of improving health and social outcomes for Kiwis of all ages. Areas of research interest include mild Traumatic Brain Injury (mTBI) and cardiovascular disease.

FURTHER INFORMATION

For further information about IRANZ or the IROs please feel free to contact the IRANZ Executive Officer, Dr Rob Whitney, on 027 292 1050 or information@iranzt.org.nz.