Te Uru Kahika
Regional and Unitary Councils Aotearoa

Land Managers Group (LMG) and Land Monitoring Forum (LMF)

A Research Roadmap for Land and Soil - 2026-2036

Research Roadmap Purpose

A council-led research roadmap for land and soil (2026-2036) was developed to guide research investment, prioritisation, and implementation. The roadmap supports sustainable land use, water quality improvement, climate resilience, healthy soils, and biodiversity outcomes across Aotearoa.

Bioeconomy Science Institute
Mātāngi Taiao

Research roadmap – land and soil 2026–2036

Envirolink Grant: 2534-MLDC17B

June 2026

Jo Cavanagh, Flo van Noppen
Bioeconomy Science Institute Mātāngi Taiao

Contract Report registration number: 2526-0146

Prepared for: Marlborough District Council on behalf of the Regional Council Land Monitoring Forum and Land Managers Group.

Disclaimer

This report was prepared by the New Zealand Institute for Bioeconomy Science Limited for Marlborough District Council. It is based on information provided by Marlborough District Council and other parties. It does not constitute advice or representation by or on behalf of the New Zealand Institute for Bioeconomy Science Limited.

© New Zealand Institute for Bioeconomy Science Ltd and Marlborough District Council 2026

This material may be copied and distributed to users without limitation, provided the New Zealand Institute for Bioeconomy Science Ltd and Marlborough District Council are acknowledged as the source of the material. This material may not be reproduced for any other purpose or in any other form without prior permission of the New Zealand Institute for Bioeconomy Science Ltd and Marlborough District Council.

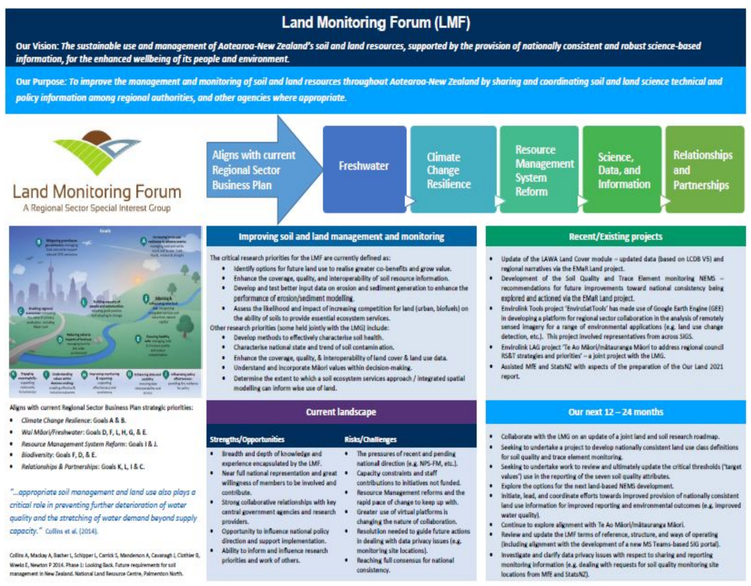
Reviewed by:
Andrew Hodson-Williams
Bioeconomy Science Institute

Approved for release by:
Sam Carrick
Principal Under
Bioeconomy Science Institute

Roadmap Summary

The roadmap makes several recommendations with a particular emphasis on implementation to achieve outcomes:

- Adopt and follow the activity roadmap
- Advocate for even greater co-ordination across SIGs to maximise the value of research in areas of joint interest
- Develop an implementation strategy
- Review this roadmap in 2029.


Land Monitoring Forum (LMF)

Our Vision: The sustainable use and management of Aotearoa-New Zealand's soil and land resources, supported by the provision of nationally consistent and robust science-based information, for the enhanced wellbeing of its people and environment.

Our Purpose: To improve the management and monitoring of soil and land resources throughout Aotearoa-New Zealand by sharing and coordinating soil and land science technical and policy information among regional authorities, and other agencies where appropriate.

Land Monitoring Forum
A Regional Sector Special Interest Group

Aligns with current Regional Sector Business Plan → Freshwater | Climate Change Resilience | Resource Management System Reform | Science, Data, and Information | Relationships and Partnerships

Aligns with current Regional Sector Business Plan strategic priorities:
- Climate Change Resilience: Goals A & B.
- Wai Māori/Freshwater: Goals D, F, L, H, G, & E.
- Resource Management System Reform: Goals I & J.
- Biodiversity: Goals F, D, & E.
- Relationships & Partnerships: Goals K, L, I & C.

"...appropriate soil management and land use also plays a critical role in preventing further deterioration of water quality and the stretching of water demand beyond supply capacity." Collins et al. (2014).

Collins A, Mackay A, Barber L, Schipper L, Carrick S, Manderson A, Cavanagh J, Clothier B, Wheeler E, Newton P. 2014. Phase 1: Looking Back. Future requirements for soil management in New Zealand. National Land Resource Centre, Palmerston North.

Improving soil and land management and monitoring

The critical research priorities for the LMF are currently defined as:
- Identify options for future land use to realise greater co-benefits and grow value.
- Enhance the coverage, quality, and interoperability of soil resource information.
- Develop and test better input data on erosion and sediment generation to enhance the performance of erosion/sediment modelling.
- Assess the likelihood and impact of increasing competition for land (urban, biofuels) on the ability of soils to provide essential ecosystem services.

Other research priorities (some held jointly with the LMG) include:
- Develop methods to effectively characterise soil health.
- Characterise national state and trend of soil contamin ation.
- Enhance the coverage, quality, & interoperability of land cover & land use data.
- Understand and incorporate Māori values within decision-making.
- Determine the extent to which a soil ecosystem services approach / integrated spatial modelling can inform wise use of land.

Current landscape

Strengths/Opportunities	Risks/Challenges
• Breadth and depth of knowledge and experience encapsulated by the LMF. • Near full national representation and great willingness of members to be involved and contribute. • Strong collaborative relationships with key central government agencies and research providers. • Opportunity to influence national policy direction and support implementation. • Ability to inform and influence research priorities and work of others.	• The pressures of recent and pending national direction (e.g. NPS-FM, etc.). • Capacity constraints and staff contributions to initiatives not funded. • Resource Management reforms and the rapid pace of change to keep up with. • Greater use of virtual platforms is changing the nature of collaboration. • Resolution needed to guide future actions in dealing with data privacy issues (e.g. monitoring site locations). • Reaching full consensus for national consistency.

Recent/Existing projects
- Update of the LAWA Land Cover module – updated data (based on LCDB V5) and regional narratives via the EMaR Land project.
- Development of the Soil Quality and Trace Element monitoring NEMS – recommendations for future improvements toward national consistency being explored and actioned via the EMaR Land project.
- Envirolink Tools project 'EnviroSatTools' has made use of Google Earth Engine (GEE) in developing a platform for regional sector collaboration in the analysis of remotely sensed imagery for a range of environmental applications (e.g. land use change detection, etc.). This project involved representatives from across SIGS.
- Envirolink LAG project "Te Ao Māori/mātauranga Māori to address regional council RS&T strategies and priorities" – a joint project with the LMG.
- Assisted MfE and StatsNZ with aspects of the preparation of the Our Land 2021 report.

Our next 12 – 24 months
- Collaborate with the LMG on an update of a joint land and soil research roadmap.
- Seeking to undertake a project to develop nationally consistent land use class definitions for soil quality and trace element monitoring.
- Seeking to undertake work to review and ultimately update the critical thresholds ("target values") use in the reporting of the seven soil quality attributes.
- Explore the options for the next land-based NEMS development.
- Initiate, lead, and coordinate efforts towards improved provision of nationally consistent land use information for improved reporting and environmental outcomes (e.g. improved water quality).
- Continue to explore alignment with Te Ao Māori/mātauranga Māori.
- Review and update the LMF terms of reference, structure, and ways of operating (including alignment with the development of a new MS Teams-based SIG portal).
- Investigate and clarify data privacy issues with respect to sharing and reporting monitoring information (e.g. dealing with requests for soil quality monitoring site locations from MfE and StatsNZ).

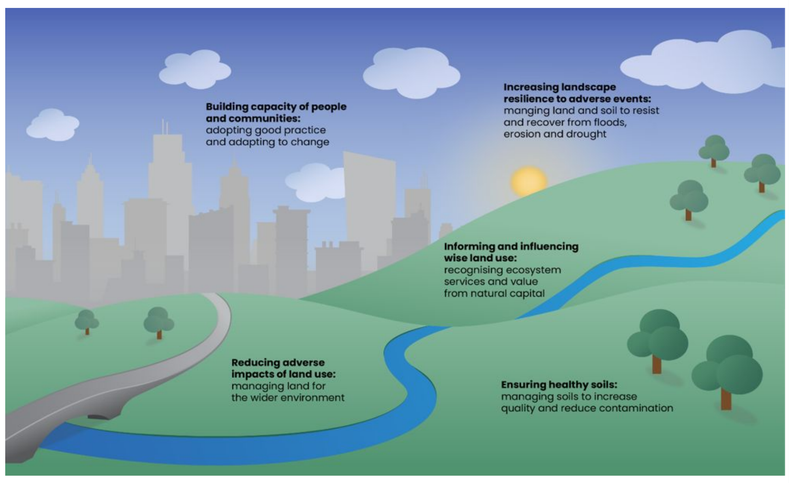
Approach to the roadmap development:

- Evaluated the 2018 roadmap and current LMF and LMG plans.
- Completed a national research stocktake.
- Surveyed councils on priority issues and engaged related SIGs.
- Undertook environmental scanning and futures workshops.
- Identified and tested priority research needs.
- Developed and refined the 10-year roadmap document.

Training workshop to build land management officer capability

The five goals of the roadmap are:

- Increasing landscape resilience to adverse events
- Building capacity of people and communities
- Informing and influencing wise land use
- Reducing adverse impacts of land use
- Ensuring healthy soils



Major Research Priority Themes

The eight research priorities identified by the roadmap are:

- Effecting land-use and management change.
- Mitigation effectiveness and cost-benefit assessment.
- Land-use and resource information.
- Resilience under climate, economic and regulatory change.
- Te ao Māori and mātauranga Māori.
- Soil health and function.
- Emerging contaminants.
- New technologies and AI-enabled monitoring.

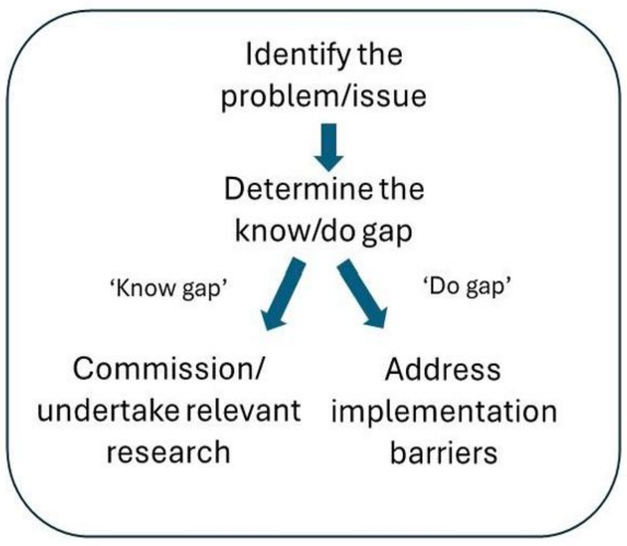
Map showing the distribution of broad land cover classes on LAWA

Activity Roadmap – Next Steps

These steps are designed to help meet the intended outcomes for land, soil, and catchment management:

1. Develop a national land and soil research repository.
2. Establish and implement annual action plans.
3. Review existing research to identify 'know' or 'do' gaps.
4. Identify and define pathways from research to implementation.
5. Better utilise monitoring data or other existing information.
6. Strengthen cross-government collaboration.
7. Develop KPIs and outcome measures to help track delivery.

Maintaining focus on the connection between the research that is undertaken and how it is used will progress toward the roadmap goals.



A simplified knowledge-to-action process for LMF and LMG to follow

Publications Summary

A research stocktake identified substantial work in the land and soil space since 2018, including:

- 154 publications on mātauranga Māori and decision-making,
- 75 publications on land management practices and policy approaches,
- 56 publications on erosion and sediment modelling, and
- 42 publications on soil health and function.

Representing a mix of MBIE, National Science Challenge, Envirolink, and council-funded research.

About the Land Managers Group

LMG annual programme 2026-2027 details

Support the Land Managers Group to strengthen technical leadership, influence science and policy, support implementation of emerging environmental reforms, and maintain a strong national network of land and catchment management professionals.

Goals:

1. Technical expertise and knowledge sharing.
2. Science and policy influence.
3. Stakeholder engagement and behaviour change.
4. Project implementation for catchment outcomes.
5. Strong professional network and collaboration.

Key focus for 2026 2027:

- Strengthen Governance and Strategic Direction
- Implement the Research Roadmap
- Support Freshwater Farm Plan and Policy Implementation
- Build greater understanding of climate adaptation and resilient communities and landscapes
- Build National Capability and Share Good Practice
- Maintain and Strengthen the LMG Network
- Monitor and Influence National Reform

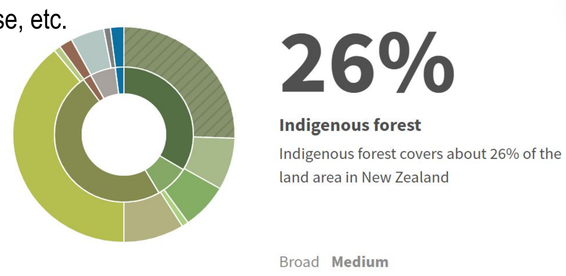
About the Land Monitoring Forum

The purpose of the LMF is to improve the management and monitoring of soil and land resources throughout Aotearoa by sharing and coordinating soil and land science and policy information between regional and unitary councils, and with other agencies where appropriate.

The LMF is focused on the provision of robust science-based information needed to support sustainable soil and land resource management. Council representatives in the LMF are predominantly staff in soil and land science/monitoring roles, or in more applied land management roles.

Our work involves the development, improvement, and reporting of state of the environment indicators, monitoring and modelling approaches, and resource inventory information on (for example):

- soil quality and trace elements,
- highly productive land,
- soil stability/erosion,
- suspended sediment,
- land fragmentation, and
- land cover/use, etc.



Representation of national land cover data on LAWA

Connections

Both the LMF and LMG are primarily connected to the sector priorities or workstreams relating to:

- Science, Data, and Insights and
- Freshwater (via catchment management)

The roadmap identified the following SIGs as being particularly relevant to connect with in support of addressing the research priorities:

- Natural Hazard Risk Management
- River Managers
- Surface Water and Integrated Management
- Geospatial
- Environmental Data

Conveners' details

LMF: Haydon Jones – Waikato Regional Council – Haydon.jones@waikatoregion.govt.nz

LMG: Leanna Birch – Auckland Council – leanna.birch@aucklandcouncil.govt.nz

Simon Stokes – Environment Southland simon.stokes@es.govt.nz