



Manaaki Whenua
Landcare Research

Manaaki Whenua - Landcare Research is a research organisation of dedicated scientists, researchers and experts committed to helping New Zealanders understand and live well with our land.

We want to ensure all New Zealanders have the knowledge and tools to live productively with our land and preserve it sustainably for future generations.

Soil erosion resulting in transfer of sediment into water is an important environmental problem in New Zealand. It significantly reduces long-term land productivity and compromises the water quality, ecological health and values of our rivers, lakes and estuaries.

We work with stakeholders across New Zealand, including national, regional and local government, Māori, the primary production sector, the science and research sector and the general public to achieve meaningful impact for our science.

Our data collection and modelling tools enable policy-makers to develop and apply robust policy instruments to solve environmental management issues. Effective modelling can be linked to economic analysis to get a full view of the wider benefits of an erosion control strategy and be able to predict outcomes for different catchments.

Recently, for example, we have contributed to development and assessment of the implications of proposed draft attributes for sediment in the National Objectives Framework (NOF) as part of The National Policy Statement for Freshwater Management (NPS-FM) for MfE.

Building research capability in sediment and erosion control



SednetNZ

SedNetNZ is a modelling tool developed by scientists at Manaaki Whenua - Landcare Research that constructs mean annual sediment budgets for regional-scale river networks. It also assists effective targeting of catchment and river management actions at a regional scale to improve water quality and riverine habitat.

SedNetNZ is continually being refined and updated to provide underpinning data about sediment load for application in land and river management.

Sediment fingerprinting

If we know where sediment comes from in a catchment, then erosion and sediment mitigations can be more effectively targeted. Manaaki Whenua - Landcare Research is involved in research developing and applying sediment fingerprinting techniques as a means of directly determining sediment sources via their geochemical and radioisotopic properties. Sediment fingerprinting also provides data for independent comparison with results from catchment erosion and sediment yield models.

Smarter Targeting of Erosion Control (STEC)

This five-year (2018-2023) MBIE-funded programme is exploring cost-effective ways of targeting land-based erosion control in the hope of slowing erosion damage and improving water quality.

The programme is led by Manaaki Whenua - Landcare Research in collaboration with NIWA, Massey University, Waikato University and international researchers together with programme partners Whanganui iwi (Tamaūpoko Community group) and Rangitāne o Manawatū as well as several Regional Councils.

Current erosion modelling tools can only model annual average sediment loads over entire catchments. STEC will improve on this through better measurements to enable prediction of erosion and sediment delivery from a single storm on a single farm, which is much more useful for planning and mitigation.

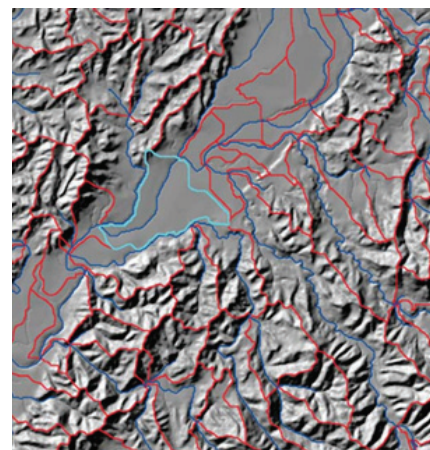
We work closely with regional councils and central government, which currently invest significant funds in regional erosion control, to give them confidence and certainty they can identify and use the best erosion management practices to meet national targets. New data-capture tools developed by STEC will enable regional councils to better prioritise where to apply cost-effective erosion control to best meet national and regional water quality objectives.

We have started sampling at four river catchment sites across New Zealand to collect these new data. The Manawatu - for new and continuing data collection; the Whanganui - to investigate impacts from the 2018 storm and legacy sediments; and the Oreti in Southland and Wairoa near Auckland - to research bank erosion and sediment fingerprinting methods in collaboration with NIWA's Managing Mud programme.

At a smaller scale, erosion mitigation research will also be conducted on farms to learn more about how effective erosion techniques are, and to further develop our sediment modelling capabilities.

Other areas of research interest

- Estimating the risk of landslides and debris flows on slopes in forestry plantations and following extreme rainfall events.
- Understanding the contribution of climate change to future sediment and erosion patterns.
- Assessing the impacts of policy implementation on the ground – can targets for sediment control be met? What does increased risk due to climate change mean for communities?



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