

Climate Change And Greenhouse Gas Inventory

Soil data are an essential input into calculating the country's national greenhouse gas emissions. Accurate estimates of soil carbon inventories and nitrous oxide emissions all depend on quality soil data across NZ's complex landscape and land-use patterns. Predicting and adapting to climate change over the coming decades will also require high-quality soil information to understand the impacts on key issues, such as erosion rates, sustainable land-use options, and the frequency and intensity of droughts.

Sustainable Productive Land Use

About half of NZ's land is used for primary production, generating export value estimated at \$45.6 billion in 2019. Soil information is critical for investment and decisions about land use: to understand not only the ability to produce food and fibre, but also how production should be managed to reduce impacts on the wider environment and communities. High-quality soil information is essential for assessing the value of land and the associated risks to investment. It underpins regional economic development, through decisions on the best areas for appropriate intensification and diversification for potential gains in product yield, quality, and value. Soil information is also key to good irrigation system design and management.

Farm Environment Plans

Farm Environment Plans are an essential tool for farmers and regional councils to manage land and water resources sustainably. Soil maps at an appropriate scale are essential to underpin Farm Environment Plans. Consistent, reliable, high-quality data and information on how to manage soil assets will help councils, industry and farmers to agree on best practice at a local scale. Innovation in the collection and management of higher-resolution soils data will add further value for farm-scale applications.

OVERSEER® Model

OVERSEER® is highly sensitive to the quality of soil information to optimise production and manage nutrient losses within catchment water quality limits. S-map provides more accurate information about soil properties, which improves the accuracy of OVERSEER® results. As more farmers rely on OVERSEER® for critical farm management decisions, demand for S-map for all agricultural land will increase.

Natural Capital Accounts And Environmental Reporting

Authoritative soils information is required to enable reporting on the state and trends of the impact of land use on our natural resources. Soil natural capital will be included in future national accounts and well-being indicators. S-map will provide a consistent and updated view of the state of New Zealand's soil natural capital.

Highly Productive Land (HPL) Is Limited

Only 14% of New Zealand is classified as 'highly productive' and can be used for many types of food production. This flat and rolling land contains our best soils, with access to freshwater and the right climatic conditions for farming and horticulture. The proposed NPS for HPL will require accurate classification and mapping of land-use capability to inform decisions about its best use. Soils are key to this classification and S-map underpins land-use capability. Better soils information will enable policy and planning to protect the most valuable soils.

Soil Erosion

Soil erosion is a significant challenge for the primary sector, and for maintaining healthy water bodies. The economic cost of soil erosion and landslides was estimated at \$250–\$300 million a year in 2015. Soil attributes inform the erosion susceptibility classification needed for the National Environmental Standards for Plantation Forestry 2017.

New Zealand Soils Are Very Diverse

We need to know what soils we have, where they are and how to manage and protect them. A comprehensive soils map which provides high-quality soil information is essential to ensure we use our land wisely. S-map covers 34% of New Zealand (as of Sept 2019) and over 5,000 soil types spread over 15,000 distinct landscape map units. 66% of New Zealand remains to be mapped.

Maintaining Healthy Water Bodies

The National Policy Statement for Freshwater Management 2017 (NPSFM) relies on soil data to understand and manage land-use impact on water quality and quantity. Regional councils use soil information together with other spatial datasets to:

- quantify and monitor contaminant losses from current land uses
- evaluate different ways of allocating nutrient loads
- identify the most cost-effective combination of measures to reduce catchment sediment losses
- assess the likely effects of land-use change on water quality and quantity, and the consequences of different policy options to reduce contaminant losses to water.

Success In These Key National Outcomes Can Only Be Achieved With High-Quality Soil Information

Demand For High-Quality Soil Information Is Increasing

S-map is a public resource that is delivered to users by a variety of methods, with the S-map Online website and OVERSEER® tool as the main access points. Soil factsheets provide detailed information relevant to the management of each soil type.

The number of individuals and organisations using S-map Online is increasing annually. Since 2012 there have been 300,000 visits to the S-map website. Although S-map only covers 34% of New Zealand, currently there are over 14,000 registered users, who last year downloaded over 33,000 soil factsheets, which provide targeted, relevant soil information. A further 93,000 data requests came from OVERSEER® model users.

S-map users span the private sector (64%), research organisations and academia (22%), and central and local government (8%).

Delivering A High-Quality Soil Information System – What Will It Take?

A comprehensive national map/database does not give us better soils, but it ensures we protect our soil resources and we use our land wisely.

The vision for the future of soil – a more detailed national soil map

Completing national coverage of S-map would require a one-off investment of around \$5 million per year for 7 years, plus an ongoing \$1.2 million per year to support the delivery and ongoing maintenance of the S-map infrastructure. This will ensure that S-map can rapidly meet the evolving needs of its many users.

We will deliver:

- a complete national stocktake of a core natural asset that underpins NZ's economy and societal well-being
- a soil information system that meets the strong demand for high-quality soil information across multiple significant national issues
- a flexible soil information system that is easy to access, and provides the right soil information to the right person at the right time
- a national asset that will continue to be used by future generations.