

# Empowering New Zealand's farmers and growers

NIWA's research and development helps farmers and growers lift productivity and profitability, and comply with environmental legislation



# Operational decisions made easier

The National Institute of Water and Atmospheric Research (NIWA) is New Zealand's leading supplier of atmospheric, freshwater, environmental and marine science services. We collect, store and manage data on New Zealand's weather, climate, marine, freshwater resources and other important environmental parameters, and deliver it using a range of tools and services that help Kiwis manage their interactions with the environment, and its resources, more sustainably and productively.

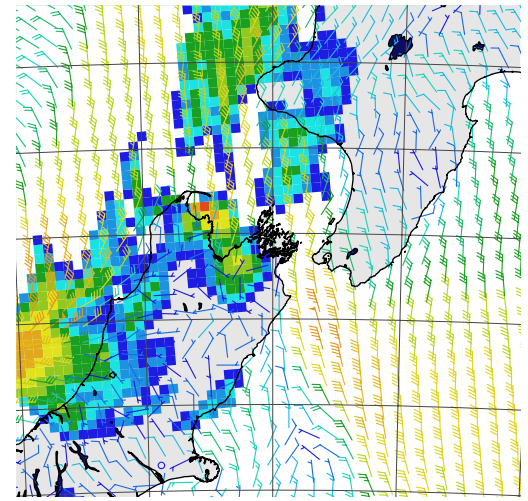
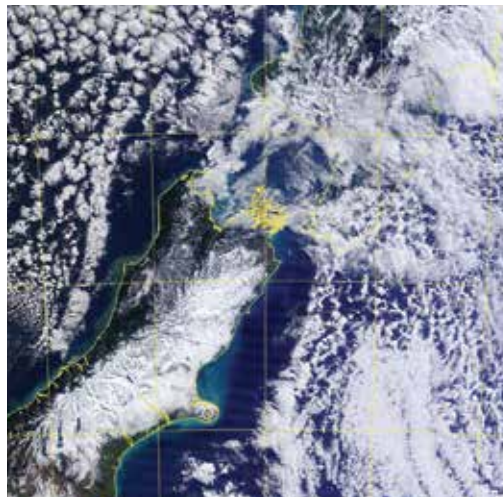
Our services to the primary sector are designed to help farmers and growers make confident and informed operational decisions, such as when and where to irrigate, fertilise, spray, harvest and move stock. We understand that maintaining a productive and profitable operation that complies with environmental legislation, amid often temperamental weather, is a complex and never-ending challenge – and we're here to help.

This brochure outlines the range of tools and services available from NIWA to support your business. We can also tailor services to your specific needs.

Most of our products are delivered over the Internet and use standard technologies, meaning you can access them from anywhere, at any time, without the need for additional hardware.

Please contact us (see back) for more information or to discuss how our services can be customised to your needs.





# Taking the environmental pulse

## Collecting data

All of the products and services we offer to the primary sector rely on high-quality data we draw directly from the environments in which farmers and growers operate.

We maintain a network of over 250 weather stations and 500 stations monitoring other environmental parameters, such as soil moisture, water flow, water quality, and snow and ice extent. Our instrument specialists are continually developing new technologies that make data collection more accurate, reliable and cost-effective.

## Managing data

The way we store and maintain the data we collect is equally important. We are specialists in this field, and we are responsible for a number of nationally significant databases:

- The National Climate Database.
- The National Water Resources Archive.
- The National Water Quality Archive.
- The National Freshwater Biodata Information System.

## Delivering data

We are also continually developing innovative ways of delivering data and information so they are as useful as possible to you. Our data delivery system is built on 'four Rs': right data, right format, right time and right details. Delivery methods include forecasting tools that help you make operational decisions, and systems that monitor water flow in real time and enable you to control irrigation remotely (see inside).

Our products utilise the very latest Internet, smartphone and app technology, so you have complete control over when and where your decisions can be made.





# Advanced science-based tools and services

## Forecasting your windows of opportunity and periods of risk

NIWA's powerful, web-based subscription forecasting and information service, powered by technology called EcoConnect, is designed to help you identify windows of opportunity to carry out key weather-dependent operations, such as fertilising, spraying and harvesting. It also helps you weigh up risk and take preventative measures like moving stock, irrigating and protecting against frost, snow, heavy rain or high winds.

Our forecasting service gives you direct access to a range of environmental information, including weather observations, a range of weather forecasts out to 15 days, seasonal climate outlooks, and added-value analyses such as soil moisture and growing-degree day maps – all tailored to your specific location. Our forecast resolution is 12km – meaning one set of forecasts for you and another for your neighbour 12km down the road.

You can set alerts that deliver an email or text message direct to you whenever conditions pass (or are forecast to pass) specified criteria – instantly identifying windows of opportunity or periods of risk.

You can also look at all our previous forecasts, to review your past decisions and strategies.

The service is backed by one of the most powerful supercomputers of its kind in the Southern Hemisphere.

## Water: managing our most precious resource

Farmers and growers rely on, and affect, the rivers, streams and estuaries around them. We provide resource management guidance, research and technology to help you optimise your water use and minimise the environmental impacts of your business.

### Assessing water resources

We can assess the reliability and availability of water resources on your property, to help you design a suitable irrigation system. Our assessments account for the potential impacts of climate variability and change. We can also advise you on the design and management of water storage dams.

### Monitoring compliance

We can provide tools that allow you to monitor compliance with water-related environmental regulations and achieve your own environmental aspirations.

### Minimising pollutant runoff

We have extensive expertise in the design of riparian strips and other methods for minimising the runoff of agricultural pollutants into waterways. We can also help you improve the quality of water already affected by runoff. We can provide you with technical advice on:

- the design and operation of advanced pond systems for treating dairy farm and other effluent
- the design and operation of constructed wetlands for treatment of tile drainage and dairy farm effluent
- the use of natural wetlands to treat farm runoff and minimise impacts on waterways.

### Assessing land-use impacts on waterways

We have developed a sophisticated computer model that estimates the impact of land use on natural waterways and river networks. The model assesses the relative cost-effectiveness of options for managing runoff.

### Managing aquatic weeds on farms

We can:

- advise you on how to minimise flooding by controlling aquatic plants
- provide methods of clearing nuisance aquatic weeds from waterways
- advise you on managing weeds in farm ponds
- advise you on effective stream fencing and effluent management.



# The irrigation specialists

NIWA designs and maintains a wide range of irrigation instruments and monitoring and control systems tailored for New Zealand conditions. Our store contains over 3000 product lines and spare parts, and we have a range of equipment available for hire.

Among our custom-designed products are:

- **Level encoders:** measuring water level with extreme accuracy (to 1mm)
- **Water level bubblers:** measuring back pressure in an air tube (caused by the weight of water above the tube orifice) and converting the pressure to water level
- **Staff gauges:** providing a coarse visual indication of water level
- **Mechanical and electronic current meters:** gauging current in rivers and channels, which is then used to calculate flow
- **Data loggers:** serving as monitoring and control nodes within irrigation systems
- **Gate control modules:** providing an industrial strength intelligent interface between a data logger and an electrically or hydraulically activated irrigation gate
- **Compact stilling well:** providing a packaged, open channel level/flow monitoring solution
- **Web and mobile irrigation system interrogation and control – at your fingertips:** providing an anytime, anywhere remote monitoring and control option.

We provide installation, support, maintenance and calibration services for all products we design. Contact us (see back) for more information.





## Find out more

For more information on ways NIWA can support the primary sector, please contact:

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### **NIWA's purpose**

NIWA's purpose is to enhance the economic value and sustainable management of New Zealand's aquatic resources and environments, to provide an understanding of climate and the atmosphere and increase resilience to weather and climate hazards to improve the safety and wellbeing of New Zealanders.

These responsibilities are outlined in the company's Statement of Corporate Intent, which is agreed with its shareholding Ministers each year.

NIWA will fulfil its purpose through the provision of research and transfer of technology and knowledge in partnership with key stakeholders, including industry, government and Māori.

To achieve these outcomes, NIWA is the lead Crown Research Institute in:

- aquatic resources and environments
- oceans
- freshwater and marine fisheries
- aquaculture
- climate and atmosphere
- climate and weather hazards
- aquatic and atmosphere-based energy resources
- aquatic biodiversity and biosecurity.