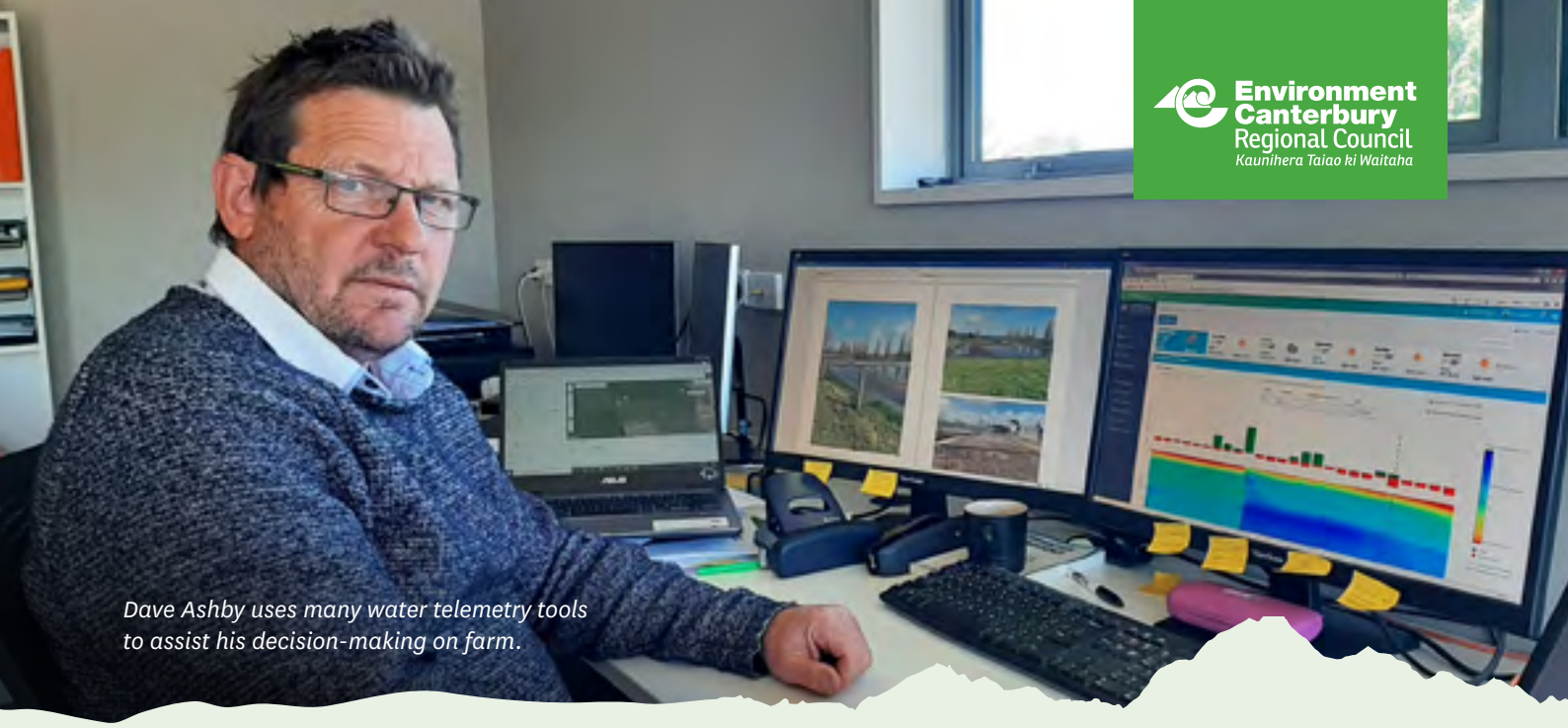


Dave Ashby uses many water telemetry tools to assist his decision-making on farm.

New gadgets the way forward in farming

Utilising the latest water telemetry technology ensures Waimakariri dairy farmer Dave Ashby's operation is a smooth one.

His operation uses many tools of the trade and he says that means he can be more efficient the limited water available.

The data comes directly to his phone or laptop which informs him on whether or not to action on-farm decisions.

"It's worth its weight in gold actually. If I didn't have (the tools), for a visual cue I'd have to dig a hole otherwise to find that information out," he said.

"We have two soil moisture monitoring sites actually on the farm, plus we're part of a NIWA irrigation justification scheme. The soil water budget shows when I can irrigate, how much I can put on and when I can put on effluent, which is really helpful.

"I can check the soil moisture, deep moisture and soil temperature with actual highlighted target zones in which to hit – all on apps on my phone called Irrimate (NIWA's soil monitoring station) and IrriMet (NIWA's forecasting tool) – which shows me daily updates."

Dave is a former Waimakariri Water Zone Committee chair, and understands the data he sees in telemetry apps directly relates to achieving his Farm Environment Plan and meet Good Managment Practice standards.

And if he does see that trends are changing negatively, that tells Dave there will be leaching of nitrate, which could enter waterways.

"When I see that, I know it'll cost me money and is bad practice. I want a situation where I only apply a little irrigation when I need to.

"It's a real privilege to have the water available, we have beautiful spring water that runs 24/7 and supports a variety of invertebrates and mahinga kai and a range of other things.

"We want clean water and we take a real pride in taking a look at the water coming out of our farm running clean.

"We have riparian planting along the edges of our waterways too. In a lot of cases we just keep the stock out and the plants come back as they would naturally," he said.

A waterway on Dave's property supports a variety of species.

It's not just about getting his cattle right for Dave, it's about the whole package.

"Even things like having the right tools for the job, regular bucket tests to test effluent tanks, old pivots checking them to be replaced correctly.

It's getting those things serviced regularly – and checking all those things are checked monthly, weekly or daily to ensure everything runs smoothly and there are no hidden surprises," he said.

Read on to find out how Environment Canterbury has been working with farmers to manage the region's water better.

Water metering

WHAT'S THE STORY

If you have a water take consent for five litres a second or more, national regulations require you to install a water measuring device and provide annual water use information prior to 31 July each year. Accurate, complete and current water information is a critical building block in establishing a water management system in which water is effectively allocated and efficiently used. Essentially, we cannot manage what we don't measure.

Environment Canterbury is working closely with water consent holders and industry partners to achieve better management of the region's water resources.

Canterbury has the largest number of water takes in New Zealand, at least twice as many as any other region.

I have a water meter, what do I need to do?

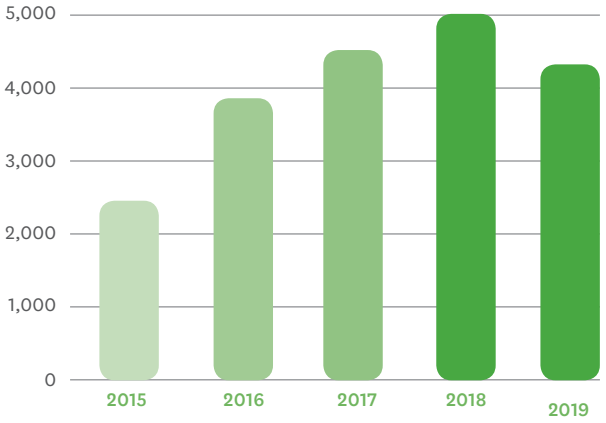
- It's your responsibility as a consent holder to ensure your water measurement system is installed by a qualified installer, who can advise on the best-suited technology.
- For your piped network, ensure your water measurement system is verified after installation (within a year of commissioning, but before 30 June) and reverified every five years.
- Ensure that your water use data for the past 12-month period is provided to your Regional Council prior to 31 July each year, either via telemetry or manually.

Our approach to water metering

As part of our wider compliance strategy, our approach to water metering is to prioritise the consent holders who present the greatest risk to the environment. If we find consent holders have not installed a suitable water metering system, or are not supplying annual usage data when required, we will take compliance action. This is likely to include a site visit at the consent-holder's expense, followed by the appropriate compliance action.

Our top priority is dealing with water users with consented takes of 10 litres per second and more, and we have made good progress, with 90 per cent of meters installed.

Currently 4300 water takes have installed systems that provide real-time monitoring, via telemetry, meaning our consent holders have gone above and beyond the national requirements for water measuring.



The number of water takes with telemetered data.

How are we tracking with water metering?

We are very pleased to have 86% of active takes with an installed meter (6300 metered takes out of 7300 active takes).

This is a significant achievement given the huge number of takes in Canterbury.

When we identify that a consent holder has not complied with their conditions, in this case to install a water meter, we start by checking what the situation is, and then begin our formal compliance procedure:

- The consent holder is sent a letter informing them of their consent conditions and what they need to do, and by when.
- When we identify a non-compliant water take our compliance action could include a formal written warning, an infringement notice (fine), and/or an abatement notice (requiring specific actions within a specified time – this could include a direction to stop taking water).
- Consent-holders are given a limited time to comply and respond to any compliance request from us.

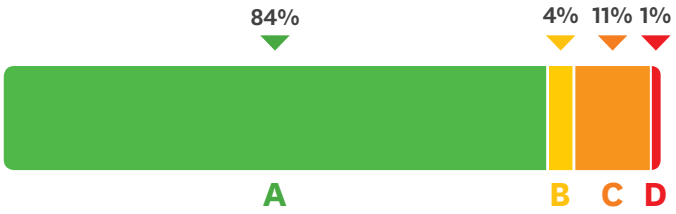
If you have any questions about water meters please call Environment Canterbury on 0800 324 636.

Our approach to compliance

It is our preference to work directly with consent holders and their consultants to resolve any issues so that we can deal with the environmental effects as quickly as possible, and avoid expensive and time-consuming compliance action.

The below graph shows the compliance grades for water use consents in 2018/2019.

1702 consents monitored



What the grades mean

(Full compliance) Full compliance with all relevant consent conditions, plan rules, regulations and national environmental standards

(Low Risk Non-Compliance) Compliance with most of the relevant consent conditions, plan rules, regulations and national environmental standards. Carries a low risk of adverse environmental effects.

(Moderate non-compliance) Non-compliance with some of the relevant consent conditions, plan rules, regulations and national environmental standards. Some environmental consequence.

(Significant non-compliance) Non-compliance with many of the relevant consent conditions, plan rules, regulations and national environmental standards. Significant environmental consequence.

Collaborative Hillslopes Project could lead to more efficient irrigation

By Andrew Livingstone

A study on Canterbury's unique rolling hill topography could yield information that leads to better irrigation and water management for farmers in north and south Canterbury.

The Collaborative Hillslopes Project, a combined effort with input from Environment Canterbury, Plant & Food Research, Lincoln University, NIWA, AgResearch, Manaaki Whenua – Landcare Research and Earth & Environmental Science Ltd is measuring how water from rainfall and irrigation enters the groundwater through loess soils.

As Canterbury's flat plains turn to rolling hills in Timaru, the type of soil changes too. Over many thousands of years, windblown silt from the plains has coated the hills with undulating layers of loess.

How – and how much – water penetrates these layers of loess soil, and where it goes once it infiltrates, is one of the major questions this multi-agency project, supported by the Lower Waitaki Water Zone Committee, aims to answer.

The research site is a dairy farm in Otaio, not far from State Highway 1. On a hillslope used for grazing and watered by a centre pivot, runoff plots measure how much water is flowing across the surface and draining downhill without entering the ground. A weir installed at the valley floor discharge point measures how much surface water exits the catchment.

Not much is visible above ground, but below the soil, a lot more is taking place. A subsurface weir and soil moisture probes are recording how deeply and how much water penetrates the ground, sending data back to scientists.

One of those scientists is Peter Almond from Lincoln University, who notes that water in loess soils moves in unusual ways, as layers tend to be separated by a fragipan – a densely compacted layer of soil that restricts water flow.

"We want to find out how water infiltrates and attenuates into the ground in this catchment," Almond says. "Does most of the water run off or percolate into the loess then move sideways when it hits a fragipan?"

This could potentially answer questions about how much water should be applied on which slopes, and when it should be applied.

For Environment Canterbury's Groundwater Science Team Leader Matt Dodson, the data will help better estimate how much water is infiltrating into underground aquifers, allowing for more sustainable water management.

Dodson says he suspects results will show that less water is penetrating the aquifers than previously thought, and that more water from irrigation and rain is getting to rivers.

This information is invaluable as it has implications for both water quantity and quality. Understanding how and where water and contaminants move in these landscapes will allow us to develop management practises to reduce their impact.

"To be able to give people tools to allow them to determine how and where to irrigate more efficiently would be a great outcome," Dodson says.

"We could be giving a farmer a set of tools to figure out when and how to be applying water."

Almond agrees that results could give farmers more accurate information.

"I'd also like to see some guidelines for irrigators and application of variable rate irrigation and other precision farming techniques to minimise the loss of effluent and nutrients from these landscapes," he says.

Almond adds that the study's findings could also aid better grazing management, providing more knowledge around what slopes are suitable for break feeding and winter grazing, and how best to carry out these practises.

Monitoring of the project will continue until June 2020 when funding ends, providing data from a full irrigation season, but the agencies involved hope to get more funding to extend beyond next year.

Meanwhile, data will be used to model surface and groundwater flows, which will be reported to farmers, researchers and Environment Canterbury staff.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Facilitating sustainable development in the Canterbury region
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