

# Research results in effective and efficient groundwater irrigation

Hew Dalrymple, part owner of a 2,750 hectare farm in Rangitikei, extracts water for valuable irrigation. He holds one of the 463 consents for groundwater takes in the Horizons Region.

Hew is also the manager of Te Hou farms, formally known as Flockhouse, which is run in conjunction with Ngati Apa and Atihau iwi. These two properties combined equal a 4,000 hectare farming operation that includes dairy, sheep and beef, cropping and horticulture – all of which benefit from irrigation.

Hew's irrigation system includes 14 bores, the largest of which primarily supplies water for the dairy branch of the farm, and has a water take consent total of 7,430cu/m a day. A firm believer in doing something right the first time, Hew has invested a lot of time and money in establishing his water take operation.

"Prior to applying for our water take consent we hired a consultant to survey all bores in the area to ensure our abstraction would have minimal effect on the environment and neighbouring bores. The research indicated our take wouldn't have a negative impact on groundwater supply. We have also

installed water meters to monitor our take 24/7 and ensure we are only taking what we have been allocated. The last thing we want is a resource that isn't sustainable. For this reason, I'm really comfortable with tracking our water use. The monitoring work undertaken by Horizons Regional Council to date continues to advance our knowledge of groundwater. We will also review the consents after three years to see how the bores are tracking and consider changes if required."

The farm is currently in year two of its consent and Hew believes farmers shouldn't be afraid of using water as allocated during the consent timeframe.

"I've learnt that nature indicates when it's under pressure and it's not like the consent is for a hundred years, we have the ability to reassess along the way. I think we've got some good safety triggers built in as we're not high users, and we've got monitoring that's getting better and better. I think we're heading in the right direction."

While installing a water meter was a condition of his consent, Hew took an extra

step of installing Variable Rate Irrigation (VRI). This is an irrigation system controlled by soil moisture probes so that only the water that's required is applied. Combined with analysis to determine the water holding capacity of his soil, Hew is constantly aiming for optimal water use efficiency.

"We range from heavy silts to light sands so soil mapping to determine how much water is required for each section of land is really important – not only for sustainable water use but also for profit. We spend hundreds of thousands of dollars on electricity and diesel to operate the irrigators so knowing where they may not need to operate saves us money and is better for the environment. Also, why would we want to over water a section of land that will result in nutrients that we've paid for being washed away? Logically it doesn't make any sense."

Hew says the process for getting a water take consent was relatively simple and Horizons water quantity staff have been helpful.

With increasing demand for water around the coastal area of the Manawatu and Rangitikei, Horizons has increased groundwater monitoring and is carrying out targeted research to better understand water resource availability. Horizons offers a free hour of advice for anyone considering a groundwater take; it's a good idea to talk to us early on. We also recommend new and current consent holders use consultants to help assess the effects of their water take, as well as determine what their actual water needs are as often this can be less than they think. Using both Horizons and consultant advice can often speed up the application process.

Technology has come a long way, soil moisture monitoring such as Hew's is a great example of how you can save time, money and water use.



# Catchment news and water allocation map

One of the key functions of a regional council is to allocate water within resource limits and monitor and report its use.

This is a requirement not only by Horizons' own plans and policy statements, but also by central government policy. Surface water allocation limits for the Horizons Region are set out in the One Plan – Horizons' Combined Regional Policy Statement and Regional Plan.

Numeric limits for each Water Management Zone (WMZ) sub-zone are set out for ease of reference and transparency for potential water users. The limits were carefully determined by considering ecological, economic and intrinsic values in the context of the specific physical and hydrological characteristics of each WMZ.

In some parts of the Region, the limits are exceeded by the existing levels of allocation. Aside from the potential environmental effects on rivers and streams, the surety of supply for users can be compromised with the potentially increased frequency and duration of low flow events, limiting access to water for irrigation and other non-essential uses.

Currently, there is water available for allocation in 110 out of 124 sub-zones, with two at full allocation and 12 that are over-allocated. This is a decrease in over-allocated sub-zones from 17 in 2015. Of the sub-zones with water available, 29 are nearing full allocation. Figure 1 is a map showing the relative allocation status of all Horizons' sub-zones and can also be viewed on the Groundwater page on Horizons' website.

Horizons has been working with consent holders in these over-allocated areas to look at increased efficiencies and reductions in take volumes through the consenting process to bring the allocation levels back into line with the One Plan framework. This is also a requirement of central government under the National Policy Statement on Fresh Water.

Changing consented limits and altering water use practices sometimes requires significant investment by the consent holders. Horizons recognises this and seeks to provide clear technical advice – and tools like telemetry and river flow information, where necessary, to assist with the process.

Over the last ten years Horizons has also committed significant investment to providing, installing and maintaining telemetry units for larger water takes and takes in high-demand areas. We now collect water use data from more than 330 individual sites and make that data available back to users via the WaterMatters section on our website. The data can be viewed or downloaded for use in day-to-day management and longer-term on-farm planning, as well as management and monitoring compliance with consent limits. The data is also valuable for Horizons in supporting resource management decision making and resource use monitoring.

## THINKING OF APPLYING FOR A WATER CONSENT?

Phone us anytime on 0508 800 800 for information and advice. **The first hour of our time is free** to you.

- The Science and Innovation team can answer your queries around water availability in your area, what information you will need to provide, and what information we have that will help you.
- The Regulatory team can walk you through the consent application process and help you fill out the forms if necessary. They can also explain the sorts of consent conditions you might expect and what they mean for you.
- The Catchment Data team have loads of practical advice regarding water meters, telemetry and pumping systems and can help ensure you get what you need from your industry providers.

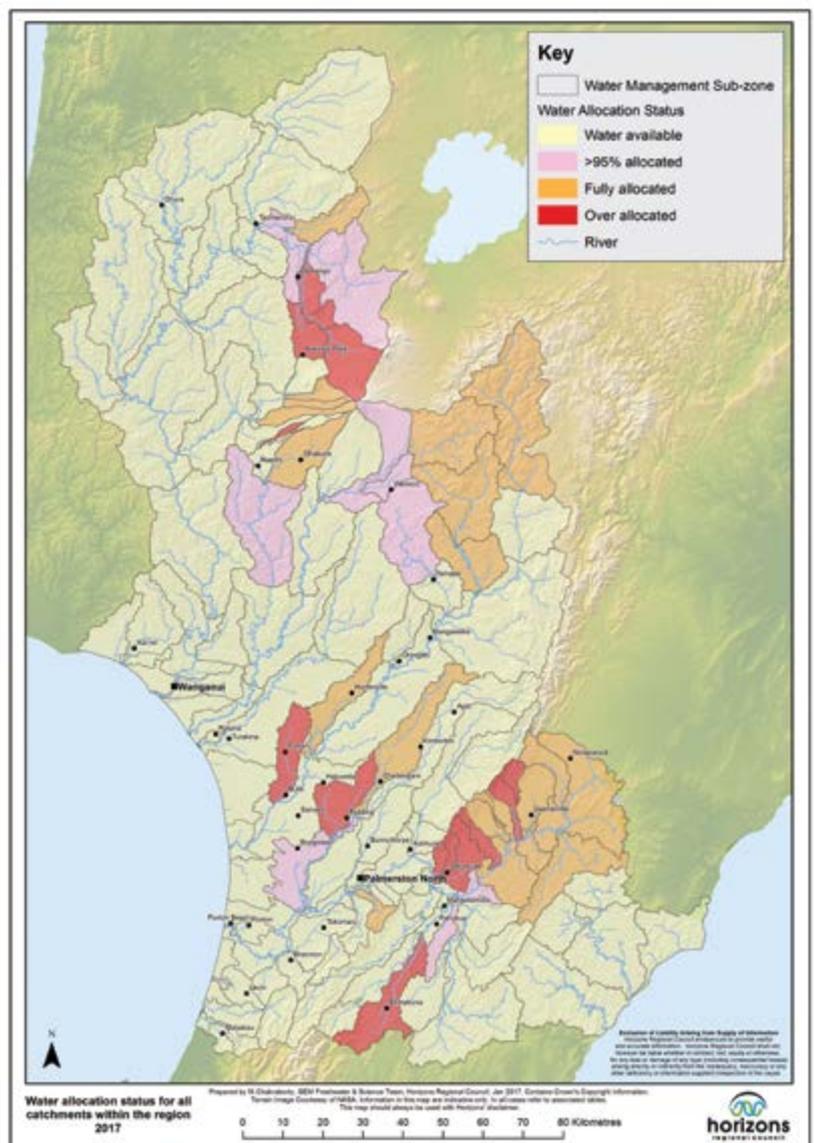


Figure 1. Water allocation status for all catchments within the region, 2017.



## Hill country stock water reticulation benefits presented

Sustainable water use also extends to considering where stock water comes from; a seminar earlier this year provided some useful advice.

The benefits of hill country stock water reticulation were presented in March during the New Zealand Agrifood Investment Week, at the Central Districts Field Days in Feilding.

The seminars were the result of a recent study carried out by AgFirst, funded by the Ministry for Primary Industries and Beef + Lamb New Zealand, and supported by Accelerate25. The study involved 11 case study farmers from across New Zealand, focusing on farmers who had installed systems in the last decade and that had been running for at least 18 months. Reticulation systems involve the installation of water tanks, pumps, pipes and troughs on hill country to replace streams and dams for stock water.

The study, a priority action identified within the Manawatu-Whanganui Economic Action Plan under the Accelerate25 programme, found benefits of installing stock water reticulation systems ranged from a significant financial return on investment, through to increased stock performance and better animal welfare along with numerous environmental benefits.

One case study farmer, William Morrison, saw not only an improvement to his bottom line, but also the wider environment. “The environmental benefits have been substantial as the pressure on our waterways is reduced, water quality is improved and the impact of drought is lessened,” he says.

AgFirst consultant, Phil Journeaux, was one of the presenters at the seminars and believes the results stack up as “all of these benefits will lead the farmer towards a more sustainable stock water solution.” The seminars covered the planning process around development/ installation of a stock water system, comment from one of the case study farmers, and government assistance for group schemes.

Four further seminars, funded by the Ministry for Primary Industries, will be held around the Manawatu-Whanganui Region during July this year.

*To find out more about these workshops contact [Erica.vanreenen@agfirst.co.nz](mailto:Erica.vanreenen@agfirst.co.nz). For more information about Accelerate25 see the [Regional Growth page on Horizons’ website](#).*

## IN BRIEF

### IRRIGATION TRAINING FOR HORIZONS’ STAFF MEMBERS

In April, twenty staff from across Horizons’ Science, Regulatory and Rural Advice teams attended a Fundamentals of Irrigation course. Designed and delivered by IrrigationNZ specialists, the course provided a good overview for newer staff. In particular it focused on good practice benefits around water efficiency for both the environment and production.

### HORIZONS WELCOMES WHANGANUI RIVER TREATY SETTLEMENT

In March the Whanganui River treaty settlement, the Te Awa Tupua Bill, had its third and final reading in Parliament. This innovative piece of legislation acknowledges a river as its own legal identity and is a first in New Zealand’s history. Amongst other things, the settlement establishes mechanisms for multiple parties in the catchment to work together to produce a whole-of-river strategy that puts the river at its core.

### ENVIRONMENT COURT’S DECISION ON ONE PLAN DECLARATIONS

Horizons recently received the Environment Court’s decision on Wellington Fish & Game and the Environmental Defence Society’s application for declarations. The focus of the declarations was with regard to implementation of the One Plan’s intensive land-use rules. The Court’s declarations have implications for what consent applicants, consultants, and Horizons must demonstrate in order for intensive land-use consents to be granted. A temporary suspension of consents has allowed Horizons to focus on process requirements. We understand that this may cause concern to applicants, and will continue to keep them updated as we work our way through the process. If you have any questions or concerns please check out the FAQs on our website or call our Rural Advice team on 0508 800 800.

# Summer swimming spot monitoring and campaign

Recognising the importance of water quality at our swim spots and keeping people well informed, we expanded our weekly monitoring programme from 17 sites to over 80 this past summer.

Using the Ministry of Health's traffic light system, bacteria level results were available for the public to view on both Horizons and the LAWA websites.

To increase awareness of what is a swimmable river and build understanding of what goes into improving water quality in our Region, two competitions ran alongside the weekly monitoring programme. 'Spruce Up Your Swim Spot' saw communities vote for their favourite site out of 12 selected region-wide. The winning spot, Whanganui River's Mosquito Point, will soon receive a swim spot upgrade by Whanganui District Council and Horizons.

The second competition, #swiminourregion, encouraged entrants to share photos on social media of where they were swimming over the summer. Di Simpson's photo (pictured) will see the school teacher taking her class on a white water rafting adventure down the Rangitikei River later this year.

During the swim spot monitoring and campaign period, Prime Minister, Bill English, and Minister for the Environment, Nick Smith, announced changes to the National Policy Statement – Freshwater Management.

Horizons Regional Council group manager natural resources and partnerships, Dr Roygard, says Horizons' One Plan already exceeds the NPS in many parts, including some of the announced changes.

"Trends from January 2006 to December 2015 show efforts being made by many landowners, organisations, iwi, and councils are making a marked improvement in water quality throughout the Region. This has been done through regulatory and non-regulatory means such as the Sustainable Land Use Initiative, the Manawatu River Leaders' Accord and the Horowhenua Lake Accord.

"Of the 16 sites in the Manawatu catchment that have ten years of data, over 31% show improving trends for E.coli and no sites show a decline.

"Rightly so, there is and will continue to be public commentary around freshwater. Overall, it is pleasing to see our Region's water quality results showing improvement and that our upgraded swim spots monitoring programme has allowed the thousands of our community members who already enjoy our beaches, lakes and rivers every summer to make more informed decisions about when and where to swim."



Winning photo for #swiminourregion.

