

Securing a freshwater future

By Ian Morton, Bay of Plenty Regional Council Water Programme Manager.

From restoring wetlands and processing water use consents to maintaining stop banks, the Bay of Plenty Regional Council invests more than \$24 million each year into caring for the region's water resources so that local businesses, communities and wildlife can enjoy the wide-ranging benefits of sustainable land and water use.

The Bay of Plenty region's water quality and supply is generally good but it's under increasing pressure and needs improvement in some locations.

Council's scientists take regular water samples from 700 monitoring sites throughout the region and run more than 25,000 water quality tests each year. That's just part of the research work Council is leading to better understand surface and groundwater interactions, availability and water contamination sources.

Live data on river, lake and groundwater levels, water temperature and rainfall is available at www.boprc.govt.nz/livemonitoring. Recent water quality sampling and trend information is regularly updated at www.lawa.org.nz.

Regional Council staff work on the ground with local landowners, businesses and the wider community, to reduce run-off and pollution into local waterways and maintain good water levels. This work includes



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pollution audits, aquatic pest management, restoration projects and the provision of practical advice and funding grants to assist landowners in taking better care of their waterways and steep land.

Demand for water in the Bay of Plenty has increased and this is likely to continue. At last count in 2015, Council had 1294 water allocation consents for groundwater and surface water takes on its books. Collectively those consents allocate a total water volume of approximately 1.94 million m³ per day. That's equivalent to 22,500 litres per second, similar to typical summer flows in the Tarawera River.

Regional Council's water management efforts are directed by the Resource Management Act and central government policies, like the Ministry for the Environment-led National Policy Statement for Freshwater.

Following informal consultation work last year, new region-wide rules for improving allocation and measurement are currently being



Regional Council Environmental Scientist, Alastair Suren, taking a flow measurement from a small stream in Te Puke.



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developed. Irrigators will have an opportunity to make formal submissions on the resulting new rules when a proposed change to the Regional Water and Land Plan is publicly notified later this year.

Discussions with community representatives from the Kaituna Maketu, Pongakawa Waitahanui and Rangitāiki catchments are also underway, to inform the development of localised objectives for managing water quality and quantity. Similar community discussions will roll-out to other Bay of Plenty catchments from 2018.

The community discussions will inform future water management decisions and the development of new Regional Water and Land Plan rules that everyone will be able to comment and submit on through plan change processes. Find out more at www.boprc.govt.nz/freshwaterfutures

Visit www.boprc.govt.nz





Research has included the use of rain exclusion shelters around avocado trees in Katikati.

How much water does an avocado tree need?

From New Zealand Avocado.

Recent research conducted in Katikati, by Dr Mike Clearwater and Teruko Kaneko from the University of Waikato, has provided valuable insight into the importance of sufficient water supply for productive avocado orchards. They found that mild or moderate drought stress is not always visible in avocado trees but can have dramatic impact on fruit growth and yield.

Good soil moisture management is essential for a healthy and productive avocado orchard. Soil moisture levels that are too high can lead to asphyxiation and encourage phytophthora, but soil moisture levels that are too low can also cause stress to avocado trees.

Avocado tree water usage is being measured by monitoring sap flow in trees of different sizes. This information is being compared to standard moisture loss rates (evapotranspiration) for pasture-covered ground estimated from factors including local weather data. Comparing the water use of avocado trees to a standard will allow the development of a crop factor that will enable other avocado growers to estimate their own water use based on their local climate.

Preliminary results obtained in the Katikati region showed that, in summer, mature trees lose moisture through transpiration at a rate of approximately half the evapotranspiration rate estimated for pasture. Smaller trees

use less water in summer than larger trees; around one quarter of estimated pasture evapotranspiration. Water use rates varied according to tree size and total leaf area relative to ground area.

Rainfall exclusion experiments were also carried out to mimic drought stress on avocado trees. The dryer conditions showed no detectable impact on flowering and fruit set.

Estimations of water use predict that avocado trees use 15 percent more water when flowering than at other times of year. The research suggests that low rainfall is unlikely to cause visible stress to avocado trees during flowering season under typical New Zealand conditions. However, fruit growth was much lower on the rainfall-excluded trees.

Any drying of soil also reduces nutrient uptake so it's important to consider the relationship between water and nutrition for avocado trees even if fertilisers are applied through irrigation.

In the rainfall exclusion experiments, the excluded trees showed a 25 percent reduction in fruit yield, and a seven percent reduction in fruit dry matter content. Simulated drought stress also made the trees more susceptible to frost damage in winter, possibly due to a reduction in vegetative growth during autumn.

These results illustrate how sensitive fruit growth is to good water supply and nutrition,

and the importance of carefully managing irrigation to ensure that fruit and vegetative growth are not impacted by dry periods. Growers can manage this by taking regular measurements of soil moisture at multiple locations and ensuring they use effective irrigation methods.



Heat pulse probes to measure sap flow on a Katikati avocado tree.



New Zealand
Avocado

NZ Avocado Growers' Assn Inc.
Avocado Industry Council Ltd

Simple rules for saving money, time and water

If you hold a water take consent, there's three things you need to do to keep compliant and avoid extra costs:

1. Have your water meter installed and verified as accurate
2. Record daily water use
3. Supply your water use records to the Regional Council on time.

You can do this via datalogger, post, email, fax or online at www.boprc.govt.nz/watermetering

If your consent pre-dates the 2010 National Water Metering Regulations, your resource consent document may not mention those requirements, but they still apply to you.

The Regulations require records to be submitted at least annually by 30 July each year. Not all resource consents are the same though, some require more regular reporting,

so it's important to check for any different or extra conditions on your particular consent document.

Water takes of 10 litres/second or more were required to be compliant with the 2010 Regulations by November 2014. Water users taking 5–10 litres/second have until November 2016 to get up to speed. Regional Council Pollution Prevention officers will be checking on 5–10 litres/second consent holders in the coming months to make sure they're on track for complying with the Regulations.

Failure to supply water records by the required date (in your consent conditions or under the Regulations), can result in a late submission charge of \$200 (GST exclusive).

Find out more about how you can keep compliant by contacting Paula Hayward or one of the Pollution Prevention team at the Bay of Plenty Regional Council, phone 0800 884 880.



Mechanical water meters like this will help keep water take consent holders compliant.



Early re-application will help business owners to maintain use of water take infrastructure like this frost protection intake system on a Te Puke kiwifruit orchard.

Don't run dry

Do you know when your water take consent expires?

Consent holders need to re-apply at least six months before their consent expiry date if they want to keep taking water. There's no automatic renewal process and delayed applications can result in extra processing costs, time and loss of your existing user status.

The Regional Council helps by sending a reminder letter three months before your re-application is due, but make sure you don't miss out by checking for the expiry date on your consent document and scheduling time to sort your application well ahead of time. Consents granted before 1991 (when the Resource Management Act came into effect) may not show an end date but they'll expire in October 2026.

The Regional Council's consents team always has a duty planner on hand to talk to you about what's involved in completing your application and assessment of environmental effects. Call 0800 884 880 (Monday to Friday, 8.30am–5.00pm) and ask for the Consents Duty Planner. If they don't answer, just leave a message and they will get back to you.

Visit www.boprc.govt.nz



Real world advice for regional policy makers

Since 2014, Bay of Plenty Regional Council staff and councillors have had a sounding board of experts on hand to help them tackle the region's big challenges for water management, through the Regional Water Advisory Panel.

The Panel doesn't replace scientific research or industry, public and iwi consultation processes. Their role is to help Council tease out possible issues and options in the early stages of developing new water policies that will give effect to the National Policy Statement for Freshwater Management.

Panel members come from the Māori, environmental, economic development, energy, forestry, agricultural and tourism sectors. Here's the team:

AL FLEMING, FOREST AND BIRD

Alan Fleming is Central North Island Regional Manager of The Royal Forest and Bird Protection Society of New Zealand.

ANDREW CURTIS, IRRIGATION NEW ZEALAND

Andrew Curtis is Chief Executive of Irrigation New Zealand, the industry body for irrigators and their service industries.

ANNABEL DAVIES, TRUSTPOWER

Annabel Davies is the Regulatory and Environment Manager at Trustpower. She has a strong background in planning for infrastructure provision in the water and wastewater, and renewable energy sectors.

ANTHONY OLSEN, BAY OF CONNECTIONS

Anthony Olsen is Chief Executive of Te Mana o Ngāti Rangitīhi Trust. He has more than 15 years' experience in business and community development, focusing on environmental protection and development.

BEN O'BRIEN, BEEF + LAMB NEW ZEALAND

Ben O'Brien is General Manager, Market Access and Advocacy for Beef + Lamb New Zealand, the industry body representing

New Zealand's 12,500 commercial sheep and beef farmers. He oversees a policy development and advocacy team for the sector that deals with trade, technical and environmental issues. He was a founding member of the Land and Water Forum.

CHRIS KARAMEA INSLEY

Chris was born and raised in the eastern Bay of Plenty community of Omaio with whakapapa connections into Te Whanau a Apanui, Te Whakatohea and Ngāti Porou iwi. He is an Independent Environment Commissioner and seasoned board director with experience on a range of public, private, Māori and not for profit boards and trusts.

CHRIS KEENAN, HORTICULTURE NZ

Chris Keenan is Natural Resources and Environment Manager at Horticulture NZ, providing strategic oversight in developing a response to water quality and quantity issues. Chris works closely with Ross Bawden, a local kiwifruit grower who attends as an observer.

EBEN HERBERT, FISH AND GAME

Eben Herbert is a Rotorua Resource Management/Habitats Officer at Eastern Fish and Game Council. He represents the interests of anglers and hunters in statutory planning processes, and advocates for the Council.

KIT RICHARDS, PF OLSEN

Kit Richards is the Environment Manager for PF Olsen, a fellow of the New Zealand Institute of Forestry, and was New Zealand Forester of the Year in 2008. His work includes environmental management, systems development and implementation, forest ecology, integrated management and commercial forest management.

LEILANI NGAWHIKA, TE ARAWA LAKES TRUST (ALTERNATE FOR ROKU MIHINUI)

Leilani Ngawhika is Executive Manager of Te Arawa Lakes Trust, supporting the Trust's environmental portfolio.

LINDA CONNING, CONSULTANT

Linda Conning is an environmental consultant specialising in planning with experience of regional water planning in both Northland and the Bay of Plenty. She is also a partner in an Eastern Bay of Plenty orchard.

PHILIP MILLICHAMP, WOOD PROCESSING REPRESENTATIVE

Philip Millichamp is National Environmental Manager at Carter Holt Harvey Pulp and Paper, responsible for environment, sustainability and external relationships across the business. He previously worked for the Ministry for the Environment, managing a climate change policy team.

RICK POWDRELL, FEDERATED FARMERS

Rick Powdrell is the Federated Farmers National Meat & Fibre Chair, Board member and Bay of Plenty Provincial President. He is also the Te Puke Veterinary Service Chairman, and farms within the Kaituna Catchment.

ROKU MIHINUI, TE ARAWA LAKES TRUST

Roku Mihinui is the Chief Executive Officer of Te Arawa Lakes Trust, a committee member of the Land and Water Forum, Iwi Leaders Technical Advisory Team, Te Arawa Lakes Technical Advisory Group and groups that assist NIWA, SCION, Rotorua Lakes Council, Ministry of Social Development and a number of trusts.

TANIA BUI, CONSULTANT

Tania is a Trustee of Tourism Bay of Plenty, Chair of the Cycling and Mountain Biking Tourism Marketing Network for the central North Island and CEO of the Rod Dixon KiDSMARATHON.

TONY FRANSEN, DAIRY NZ

Tony is a Developer with the DairyNZ sustainability team, focusing on implementation strategies for environmental regulations and development of the Sustainable Milk Plan programme. His farm experience has been both hands on and strategic level.