

OUR LAND  
AND WATER

Toitū te Whenua,  
Toiora te Wai

# Latest News Update

DECEMBER



Ken Taylor - Director  
**Our Land and Water**

## Our next Challenge

*Kia ora koutou katoa*

The end of the year is often a time of reflection, a time when people look back on what they've achieved and set their goals for the future. Here at the Challenge we've been thinking about the future of what land and water science New Zealand needs us to do and how we can all make it happen.

### Key Dates

Regional Councils Stakeholder  
Workshop: **5 December**

Challenge Parties meeting: **12  
December**

Annual Symposium : **4-5 April 2018** -  
Wellington [RSVP HERE](#)

We're in planning mode for our second stage of funding from MBIE for future Challenge science to take place between 2019-2024. Over the next four months we're going to be reaching out to gain your perspectives on what science you think the Challenge could and should do in the future. We want to hear your ideas and we want you to join us to discuss our future plans at our annual Symposium on 4-5 April 2018 in Wellington. You can [RSVP now](#).

In the last newsletter we talked about the need to target the capability gaps in land and water science directly, and how we can build the future resource of young leaders in the land and water space. We have two new initiatives partnering with the Challenge that is our starting point to help bridge major gaps in future science and leadership capability.

The Challenge is now the proud new key sponsor of the [Puhoro STEM Academy](#) a programme set-up by Massey University the Academy fosters young Māori school pupils from Year 11 on their journey through to university, and ultimately the workforce. A new capability building programme, [Next Generation Influencers](#) has also been funded by the Challenge which will equip people with the potential to be the next generation of leaders and influencers in the land and water area. This aims to build the capacity of society to shape and use the outputs of the Challenge in parallel with building capacity in science.

Before I go I want to pass on all of our congratulations to our Chief Scientist, Professor Rich McDowell, who has been named a Fellow of the Royal Society of New Zealand. A well-deserved distinction for a brilliant and hard-working scientist.

In this issue we give you our Chief Scientist update, we highlight one of our research papers' that was recently published in the *Journal of Environmental Quality* and we share some of the stories that the Challenge has featured in in recent media.

Nga Mihi, Ken.

### Contact Us

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*Chief Scientist's Update*

## Successful Māori science proposals

Our contestable funding process brought in 12 excellent proposals in our recent RfP. We're thrilled to announce that we have selected two successful new Mātauranga Māori programmes to be a part-of the Challenge. Each successful programme was awarded \$250,000 funding.

The first is out of Victoria University called *Communicating Kaitiakitanga: Land, Food and Water Science Storytelling Project* led by Jo Smith. The second is led by John Reid from Canterbury University and is called *Toitu te Whenua, Toitu te Koira, Toitu te Tikanga - Whenua, Life, Values!*

We're looking forward to working with both of our new teams and to keeping you all updated with our research results.

## Future strategy research

In our preparation for our next funding phase we are undertaking several pieces of research and engagement work. We are refreshing our Research Landscape Map which will help guide our plans for our future strategic science work.

We're also undertaking a think-piece with environmental NGO's about what future science research this sector need the Challenge to do that will help to achieve our

mission. We have research underway about what science the Challenge can do to support the UN Sustainable Development Goals.

We have just completed a Strategy Landscape Map which assesses the alignment of strategic goals and activities of Māori, industry, government and NGO stakeholders with the mission and objectives of the Challenge.

## Latest research results

Our Challenge is looking to make indicators currently collected for agricultural productivity and environmental impacts more useful for stakeholders in the primary sector.

PWC on behalf of the Challenge has convened a group of interested parties from central government, the science sector and agricultural industries to cooperate on the good use of indicators. They have just released their [report on the qualities of fit for purpose indicators](#) which can be viewed on our website.

The Resilient Rural Communities (RRC) research team have also just released their [latest report](#) which seeks to support informed decision-making about research in our Collaborative Capacity theme using the RRC framework.

The report recommends a more explicit linkage between the local or regional focus of Collaborative Capacity and the national-scale focus of the Challenge. It also recommends additional research on how strengthening the capacity of institutions can lead to economic and environmental outcomes.

## Save the date

National  
**SCIENCE**  
Challenges

Our Land and Water National Science Challenge

### *The Way Forward*

Join us at our annual symposium to discuss what land and water science we should do in the future

Wednesday 4th and Thursday 5th of April 2018  
University of Otago **Wellington** Conference Centre

For any further information visit our website - [www.ourlandandwater.nz](http://www.ourlandandwater.nz)

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### Research Result Update

## Contaminant yields and losses in small streams

A Challenge funded [paper](#), led by our Chief Scientist, Professor Rich McDowell was recently published in the *Journal of Environmental Quality*.

### Method

The research modelled the characteristics of New Zealand's river catchments, and then tested whether proposed regulations for livestock exclusion from large streams would make a big difference on contaminant loads.

***The researchers used a decade of concentration and flow data to work out the loads of pollutants, including nitrogen, phosphorus, suspended sediment and E.coli, at 728 water quality monitoring sites around the country.***



### Results

Currently streams less than a metre wide and 30cm deep, and lying in flat, pasture-dominated pasture, are exempt from the proposed stock exclusion regulations.

***The research team found it was these very bodies that accounted for an average of 77 per cent of the national contaminant load, varying from 73 per cent of total nitrogen to 84 per cent for dissolved reactive phosphorus.***

"The fact that most of the contaminant load comes from areas not requiring stock exclusion reflects the large number and areas occupied by small streams in catchments dominated by agricultural land uses." McDowell said.

### Mitigations

The report notes that to substantially reduce contaminant losses, other mitigations should be investigated in small streams, particularly where fencing of larger streams has low effectiveness.

McDowell says, "We already know where to target our strategies to prevent contaminant loss into the small shallow streams."

It's done by assessing landscapes and coming up with critical source areas, which are areas on the farm that account for a majority of contaminant loss, but only come from small areas.

***Defining critical source areas enables farmers to target their mitigation strategies much more. By doing that there is an increase the cost-effectiveness of those mitigation strategies by about six or seven times over an untargeted approach.***

Farmers are dealing with an increasingly complex farming operation and mitigation techniques need to be as simple as possible.

McDowell says, "A combination of better awareness of the issues and the use of good management practices - including fencing - in the right place is starting to reverse degrading trends in the likes of phosphorus and sediment in the water over the last decade."

***Continues next page***

## What happens now?

Farmers have already invested in a major programme of fencing waterways to the equivalent of nearly 27,000km. McDowell says, "They should continue to do so as it was effective at reducing waterway contamination. Fencing is very effective at reducing contaminant loads to waterways - by 10 to 90 per cent depending on the nature of the contaminants and local issues."

Fencing can work especially well for the likes of *E. coli* or phosphorus contamination that can result from animal waste or stream bank destabilisation. However, McDowell says that, "**fencing all waterways in New Zealand was impractical and in some places other good management practices may be more cost-effective.**"

"The country certainly has challenges with water quality, but there is a lot of work being done. I'm optimistic about our ability to implement strategies and with a bit of foresight, investment and a bit of common sense I think we can get there."

"It is just bringing people along on that journey in a time frame that they find acceptable and this is the hard part. It's not an overnight fix, it's probably going to take five years to a generational timespan to fix this," he said.

## In the media

In October, Challenge Director, Ken Taylor presented to the Forest Growers Research Conference about Social License to Operate. The Stuff News website **published a story** about the presentation.

In early October **Fairfax Media, NZ Herald, Radio NZ and Country TV** ran stories about a Challenge funded research paper published in the *Journal of Environmental Quality* of which our Chief Scientist was lead author. News of our Chief Scientist, Professor Rich McDowell, also becoming a Fellow of the Royal Society was also released last month and was covered by the **Otago Daily Times**.

Remember you can keep in touch with us via e-mail ([ourlandandwater@agresearch.co.nz](mailto:ourlandandwater@agresearch.co.nz)) or by following us on **Facebook** and **Twitter**.

