WEST COAST CATCHMENT GROUP 14 OCTOBER 2024

Water Quality Update

University of Otago | University of Canterbury

Expanded Water Quality Sampling

As of 2024 we are sampling more locations – including tributaries above, within, and below farms

The high rainfall and farming practices on the Coast combine to produce some of the highest water quality across New Zealand. The water quality of the large rivers in south Westland is 'near' pristine with nutrient levels that are mostly consistent with that of rivers draining native forest. The median nitrate-nitrogen concentrations are 22 μg/L and well within 'Band A' of the National Objectives Framework (<1000 μg/L). Median phosphorus was 2 μg/L and well within all regulatory limits (< 8 μg/L).

1

NITRATE

Not of concern

2

E. COLI

Some localised 'hot spots' of E. coli in tributaries

3

PHOSPHORUS

Not of concern

Monthly Sampling

From October we will do monthly sampling for N and P.

Quarterly Sampling

For E. coli, visual clarity, suspended sediment. Next visit is December.

Annual Sampling

Microbial tracing and eDNA. Next visit is December.

Bacterial Contamination of Waterways

Concentrations of animals can lead to increased amounts of bacteria in water and can lead to illness if ingested.

In April 2024 we sampled the main rivers between Jacksons Bay and Fox, and some smaller tributaries that flow over farms and into the main catchments. Recent rain (about 40 mm) affected the initial samples collected so that the first samples had higher concentrations of E. coli compared to two days later. This effect is known as a "first flush" and it is expected that E. coli is higher with rain. For example, the Haast at the SH6 bridge was 63 colonies per 100 mL. Within 2 days concentrations had returned to baseline levels (2 colonies per 100 mL at Haast); so we will report on those baseline levels.

E. coli is tricky to measure on the Coast as samples need to be incubated within 24 hours of collection – so we bought our lab to Haast. Most rivers (even the pristine forested catchments) have some E. coli, often from feral animals and bird populations. We found that the pristine

rivers had very low E. coli, usually <2 CFU/100 mL and many where it wasn't detected at all.

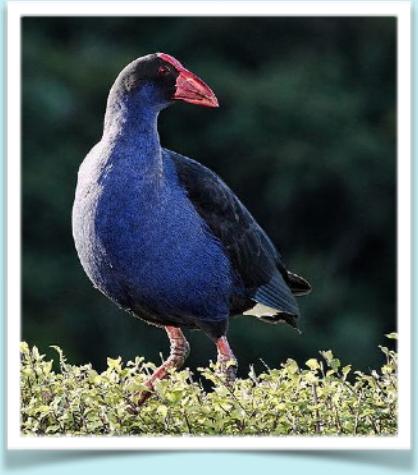
"Almost all sites met the wadeable water standard for E. coli"

The smaller tributaries on farms certainly had higher E. coli and 3 locations exceeded the New Zealand Health Standard for 'wadeable' rivers (> 550 colonies per 100 mL). Most rivers met the swimmable standard (> 125 and < 550 colonies per 100 mL). At one location the source was obvious – a decomposing carcass that had been deposited into a waterway. Keep an eye out for illegal carcass dumping, as it is detectable in the water!

BIOHERITAGE OF THE HAAST RIVER

The plants and animals of New Zealand are quite distinctive and are iconic to the wildness of the West Coast. We are teaming up with WilderLabs and ESR to identify what is living in and around the Coast rivers. The technique uses fragments of DNA that are conveyed down the rivers (known as environmental DNA, or eDNA for short) and it can provide details on fish, fungi, bacteria, plants, animals, and birds that live within or around the river.

The best time of year to sample for eDNA is summer, so we will be out in the rivers then collecting more samples to tell us about what's in the Haast River, and how it might vary along the river corridor.



A Decade of Monitoring

We have also been working on reporting our findings to local organisations (Department of Conservation) and preparing a paper for international publication. These reports help establish the quality and reliability of the collaboration between the West Coast Catchment Group and the University of Otago and University of Canterbury. Our paper is still being reviewed – but here is our main finding on the nitrate nitrogen concentrations on the West Coast, based off sampling of these rivers since 2012. Fundamentally the water quality is near pristine, and has not significantly changed over the past decade.

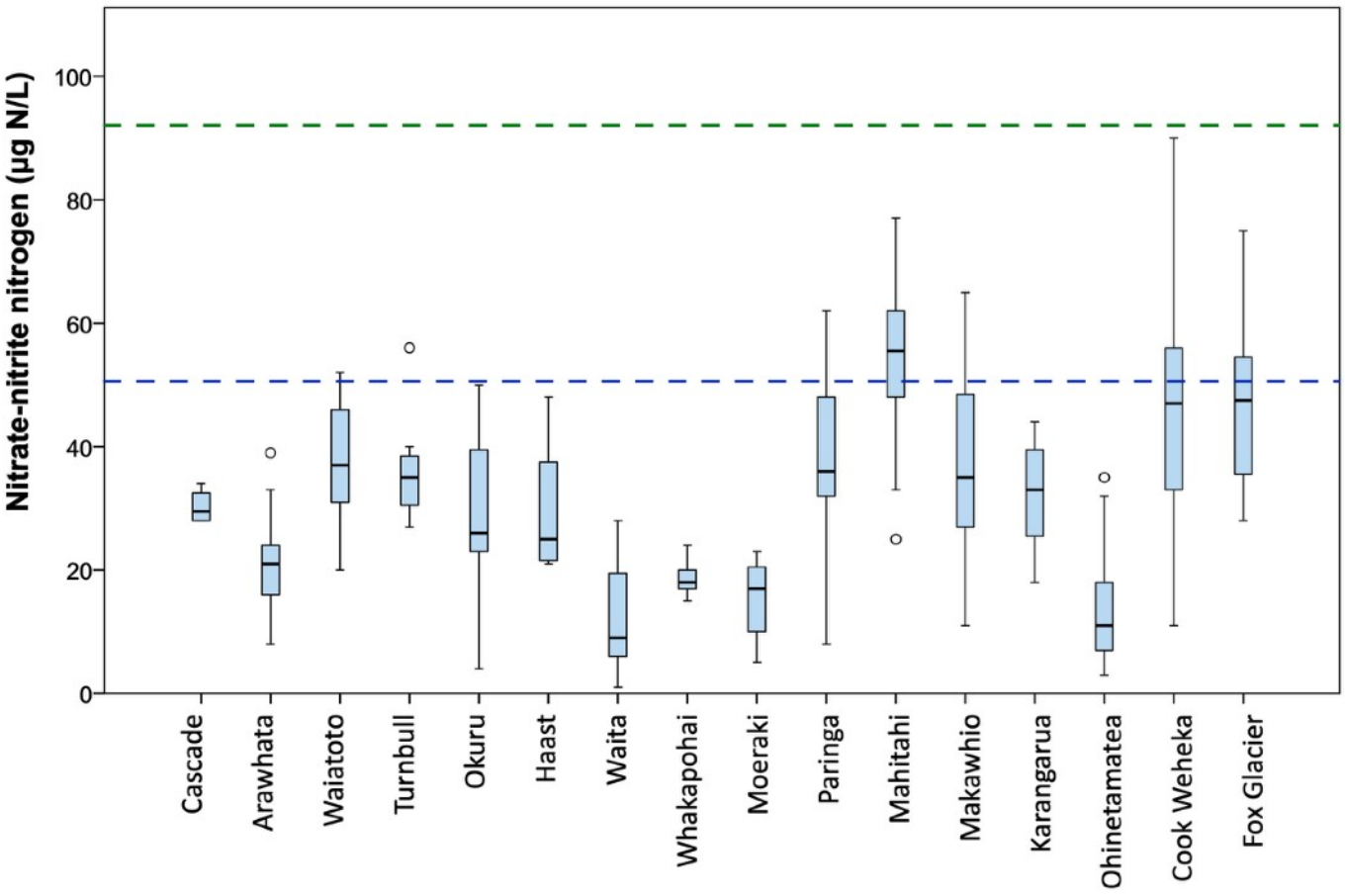


Figure (above) shows the nitrate nitrogen concentrations measured in the main rivers of south Westland as monitored by the University of Otago since January 2012. These data are from 17 visits to the coast over the last decade and show the generally outstanding water quality of these rivers. The dashed line shows the Australian and New Zealand Conservation Council recommended nitrate level for the protection of species, which is 90 µg/L (this threshold is much more stringent than the 1000 µg/L defined in the National Objectives Framework within the National Policy Statement for Freshwater Management (v. 2020).

What about the tributaries quality?

Smaller creeks and streams are more vulnerable to contamination and pressures from farming

We've designed our sampling strategy to compare west coast rivers to west coast rivers. We recognise that the Coast is pretty special and that national comparisons don't work. If we want to see the effect of local farming on local rivers we need to benchmark that to pristine, non-farmed rivers. To do that we sample rivers flowing through native bush – Whakapohai, Moeraki (above the lake), Ohintetamatea at SH6, and the upper parts of the Haast in Mt Aspiring National Park (above the grazing permits); as well as those coming off the highest parts of the Southern Alps/Ka Tiritiri o te Moana (Cook Weheka and Fox). Why bother with the Cook Weheka and Fox? Well it turns out that glaciated catchments also produce more nitrate than non-glaciated catchments, so we need to account for that as well.

The smaller tributaries on farms had some outliers where there was higher nitrate nitrogen, but not at levels of concern. We will continue to monitor to assess whether these locations are consistently elevated, or whether it is natural variability.

Visual clarity tends to be better in the control catchments but these data are affected by recent rain and we will continue to monitor for this variable quarterly.

E. coli is certainly elevated in the tributaries and is detecting the greater presence of animals. Locations with over 550 colonies per 100 mL will be monitored closely as these exceed recreational contact limits for waterways.