



Water quality trends in Canterbury – August 2018

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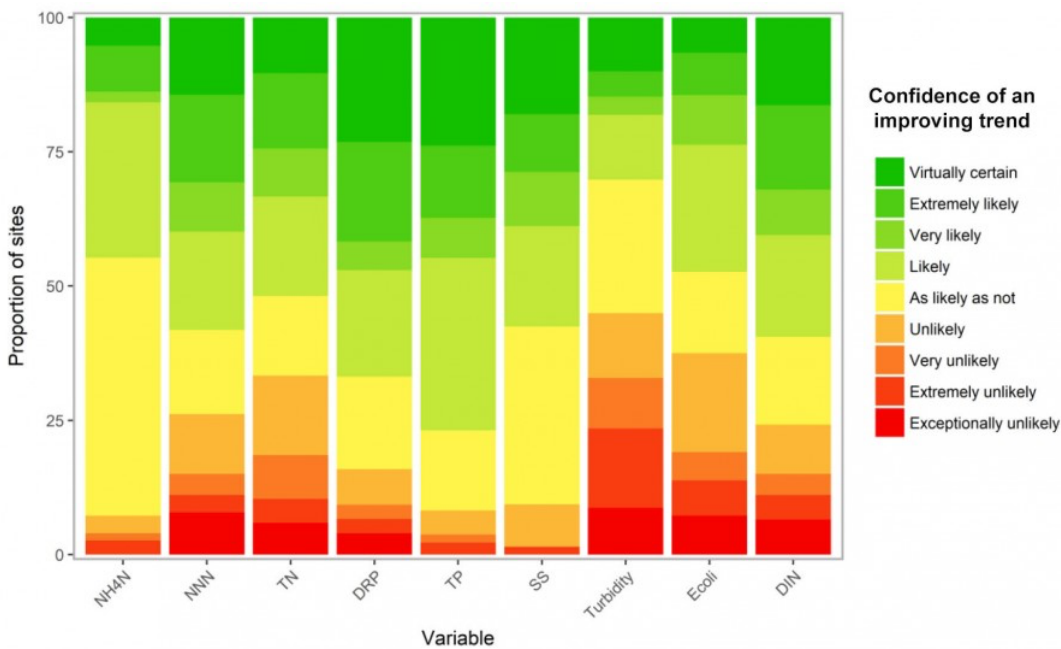
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People have been asking - what evidence do we have that water quality is improving across Canterbury? And over what time frame – are we talking five, 10 or 25 years?

We have plenty of data – in fact, 144,263 measurements taken at 156 Canterbury river monitoring sites over the past 25 years. Careful and independent analysis of this data gives us a good picture of what's going on – and tells us whether water quality is getting better, or worse.

Read the full Surface Water Quality State and Trend Analysis report.

Here is a graph showing the trend in water quality over the past 10 years across nine attributes. Green colours indicate improving sites and red-orange colours indicate degrading sites.



This analysis shows there are more sites in Canterbury that have improving trends than declining trends. At the national level there is a similar pattern of more improvements in trend than declines.

All but one water quality attribute showed more Canterbury sites were improving than degrading over the past 10 years (with a probability of 67% or greater). The attributes are:

• NH ₄ N (ammonia toxicity)	45% of sites improving, 7% degrading
• NNN (nitrate-nitrite-nitrogen)	58% of sites improving, 26% degrading
• DIN – dissolved inorganic nitrogen	59% of sites improving, 24% degrading
• Total nitrogen	52% of sites improving, 33% degrading
• DRP – dissolved reactive phosphorus	67% of sites improving, 16% degrading
• TP – total phosphorus	77% of sites improving, 8% degrading
• SS – suspended sediment	58% of sites improving, 9% degrading
• Turbidity	30% of sites improving, 45% degrading
• E-coli	47% of sites improving, 38% degrading

While it is encouraging to see an overall pattern of improving fresh water quality, and we still have work to do, there is plenty going on to protect and improve fresh water quality.

This includes stricter and more targeted planning rules, more planting and fencing of streams, better effluent management, improved irrigation practices, millions spent on biodiversity restoration projects, smarter technology and investment in on-farm systems, better on-farm training, improved compliance and monitoring, as well as the programme of industry-agreed Good Management Practices and the introduction of audited Farm Environmental Plans for most farmers in Canterbury.

How do we measure water quality?

The columns in the graph show the nine things we use to assess fresh water quality, and fall under three main areas:

Bacterial contamination

Escherichia coli are bacteria found in the digestive system of warm blooded animals and birds (e.g., cows, humans, dogs and ducks). E. coli indicates the presence of excrement and the risk of more harmful bacteria being present that can make people sick. Sources of E. coli include stock in waterways, water birds, run off from land and septic tank leaks.

Nutrients

Nutrients

Nitrogen (nitrates & nitrites)

Too much nitrogen can cause unwanted plant and algae growth in waterways. This can smother stream beds and destroy habitat, as well as reducing the amount of oxygen or affecting the pH of the water. Soluble nitrogen compounds come from the leaching of urine patches or fertiliser on pasture, from the runoff or leaching of effluent, or directly from sewage and stock in waterways.

Phosphorus (Dissolved Reactive Phosphorus)

This form of phosphorus – DRP – is soluble and easily absorbed by plants and algae. The amount of phosphorus in natural systems is low – but concentrations increase as a result of soil erosion, runoff containing fertiliser, animal or plant matter, or the direct discharge of sewage.

Sediment (cloudiness)

Turbidity is the technical term for how clear water is – high turbidity is caused by lots of small particles (clay, silt or sand) suspended in the water. When this happens light cannot pass through the water – this affects plant growth, as well as smothering fish and invertebrates. People also like clear water for swimming and playing in.

In Canterbury, many of our spring-fed waterways are crystal clear when they emerge from the ground. As they flow towards the coast they can be contaminated with sediment from river works, bank erosion, stock crossings, runoff from land, as well as the removal of riverside vegetation.