

# Kelvin Nicolle Talk at the River March 2016

## Kelvin Nicolle. Waterwatch.

### Stream Study notes:

Kelvin's speech at the beginning talk about the importance of the way we should talk about sampling and monitoring freshwater streams. He said we should use definitive words like "could"

Mayflies were the dominant species that require oxygen... Is this their habitat? If it is their habitat why are they not here? Algae etc?

Modern farming regime (dairy farming) vs older farming regime (wool and crop farming)

E.coli is used as an indicator for other pathogens in the water and bacteria such as salmonella and norovirus.

Canterbury water systems + the age of the water in different places, you can age water using CFC's.

<http://ecan.govt.nz/publications/reports/r0230.pdf>

Clover was used on the plains before dairy farming – ribosomes fix nitrogen and make nitrate. The nitrate gets washed into the waterways by rain. MAV means: Max allowable value, the MAV is 11.3mg/L (for nitrogen)

<http://ecan.govt.nz/advice/your-water/water-quality/pages/nitrates-water.aspx>

How does oxygen get into the water? Not easily, it takes a lot of effort and time for water to be oxygenated. Wind, rain, sun and movement (cascades, waterfalls) are factors that help oxygenate water. Hot water holds less oxygen. Oxygen level in water is lowest in the early hours of the morning. Due to no sun, not much wind. Maori said: a stream we can hear is a good stream.

Detergents and fertilisers – phosphates

Septic tanks leak into the river – e.coli

High levels encourage plants to grow in the river. This is potentially eutrophic.

Plants flourish > Plants decompose with the help of bacteria which uses oxygen > less oxygen for animals > Plants indicate higher nutrient levels (stream is enriched) > Polluted

Turbidity is very important. Sediment blocks gills (cannot intake oxygen), layers plant in silt (cannot absorb light to perform photosynthesis), heats up water because the sediment attracts the warmth (like a black car) > oxygen levels decrease.

Selwyn River at Whitecliff Overview (by Kelvin).

The significant difference between Selwyn river here and the river at Coes Ford is the local farming regime: range farming, Cattle and sheep on the hills, forestry. This is a primary river that supplies central Canterbury aquifers. There was 1 cubic metre of rain recently. There is still a bacteria count but it is significantly lower than Coes Ford. One of the major problems is Silver stream, which later feeds into the Selwyn River. Down stream there are more dairy farmers spraying effluent on the pasture. The wind can blow the spray into waterways and rain can wash the spray into waterways. Geologically, this area is volcanic. There is igneous and metamorphic rock, volcanic boulders, fault lines etc. Volcano is older than Banks peninsula. Coal seams and fault lines all the way to Mt Somers. Exotic vegetation, bramble, willows etc.