



# Surface Water Quality - Monitoring 2016

## Key Points

- 35 river sites are monitored on a monthly basis
- The parameters monitored provide information about the suitability of water quality for aquatic life, and recreational uses
- The monitoring results of the last three years were combined into the Water Quality Index
- The Water Quality Indices for most sites indicates good or acceptable water quality, but a number of sites have low Indices, indicative of degraded water quality
- Soluble Inorganic Nitrogen concentrations in a number of rivers in the northern part of the region increased over the last five years, while concentrations in spring-fed rivers in the lower Wairau Plains are decreasing

## Where and how we monitor river water quality

Monthly monitoring is carried out at 35 river sites across the region. The monitoring consists of field measurements and the collection of samples that are analysed for a number of parameters by an independent accredited laboratory.

Sampling sites are generally located at the bottom of catchments. This allows us to pick up significant changes in water quality in any part of the catchment upstream.

In very large catchments, such as the Wairau River, an additional sampling site is located in the upper catchment and large tributaries are monitored as well.

The catchments monitored cover a wide range of climatic factors, geology, hydrology and land uses.

## What we measure

Our rivers are the home of fish and other aquatic animals. A number of the parameters that we monitor allows us to determine if water quality is sufficient to support aquatic life. These parameters include:

- *Water Temperature*
- *Dissolved Oxygen levels*
- *pH*
- *Nitrate concentrations and*
- *Ammonia concentrations*

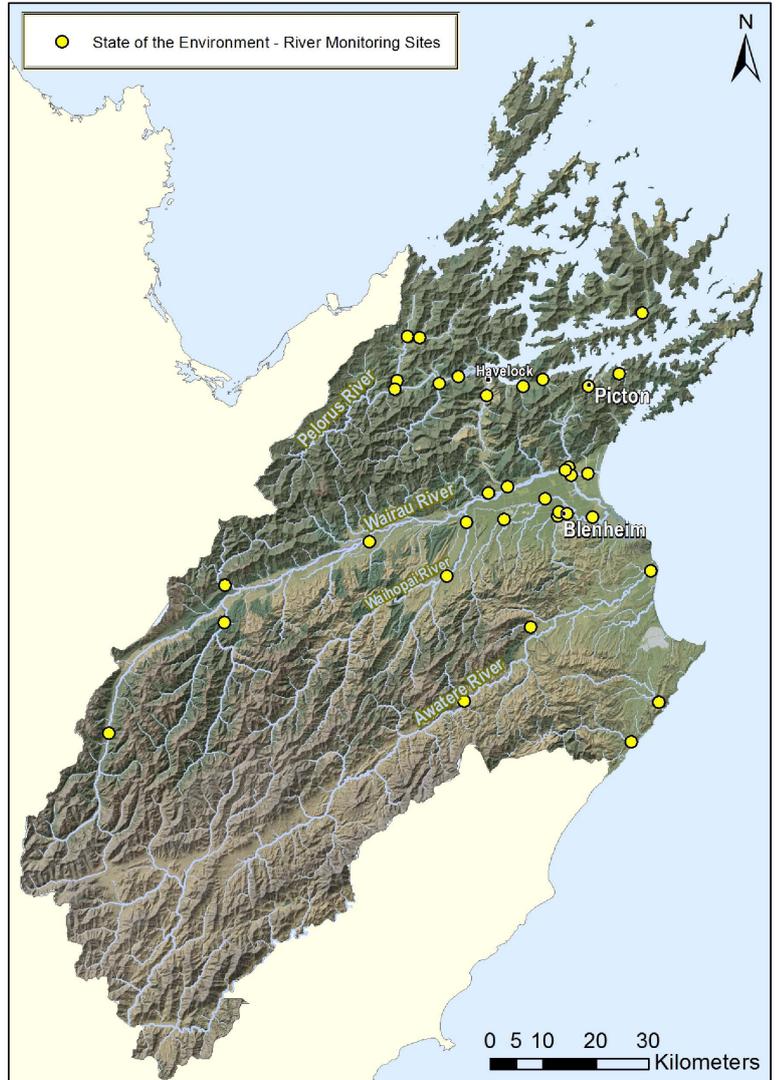


Figure 1: Map of sampling sites in Marlborough

We also monitor the concentrations of

- *Soluble Inorganic Nitrogen* and
- *Dissolved Reactive Phosphorus.*

These are the forms of nitrogen and phosphorus that are easily taken up by plants. High levels of these nutrients cause excessive growth of algae, which is not only unsightly, but also effects the habitat quality for aquatic animals.

Parameters monitored, that are important in regard to recreational use include:

- *E. coli concentrations* and
- *Turbidity.*

# The Water Quality Index

The Water Quality Index combines three years of monthly monitoring data into a single number, which allows easy comparison of water quality in the different streams and rivers. The higher the Index the better the water quality. The dark blue bars in the figure below show the Water Quality Indices for the 35 river sites monitored. The right side of the figure shows the parameters that reduce the Index.

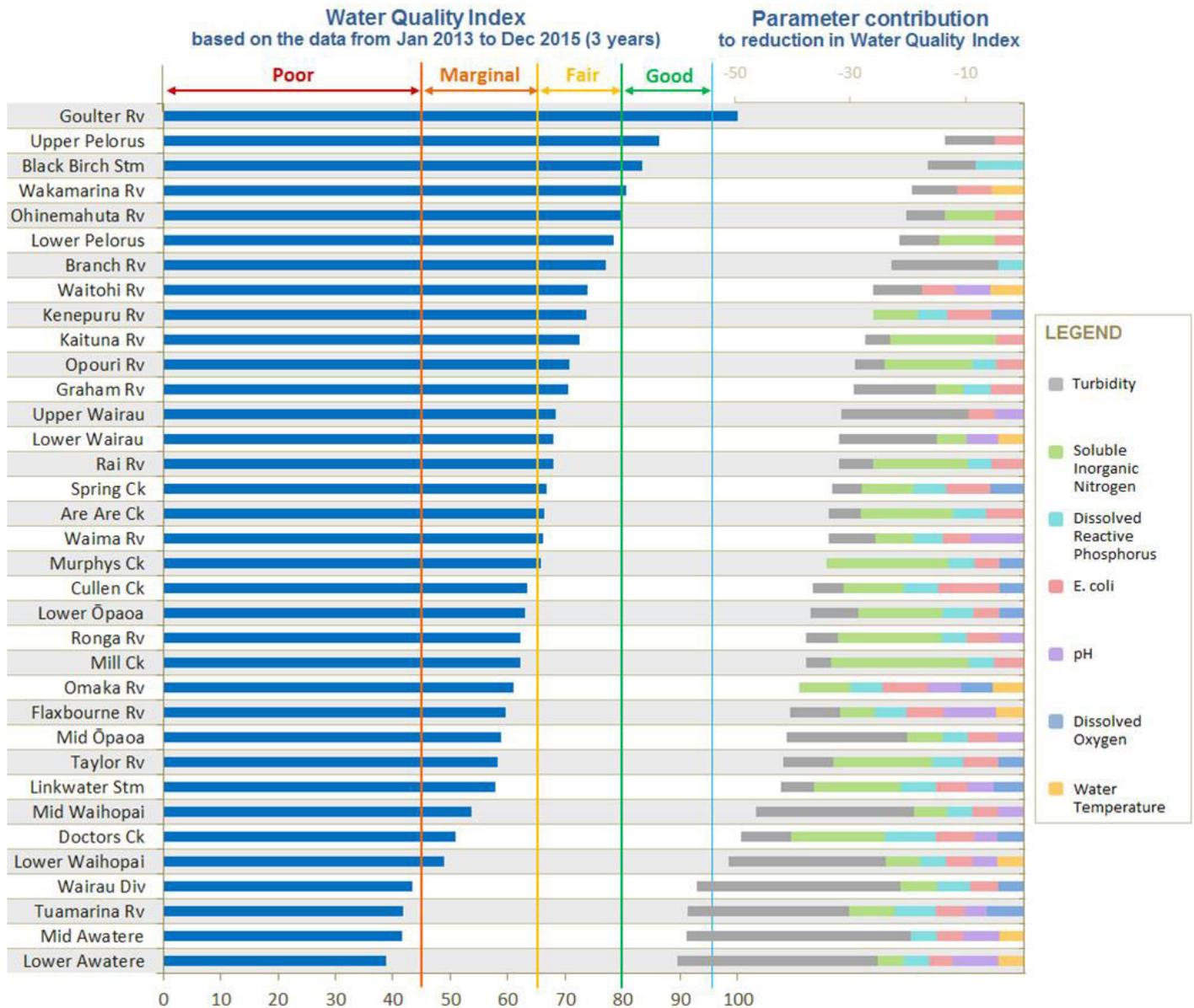


Figure 2: Water Quality Indices and the Parameter contributions to the reduction in the Indices for the period 2013-2015.

The Water Quality Index allows the categorisation of water quality into five classes, Excellent (not shown), Good, Fair, Marginal and Poor. Most sites are in the fair category, which represents acceptable water quality, but there are also a number of sites in the marginal category indicating degraded water quality.

## Changes over time

A number of rivers had significant increases in E. coli concentrations over the last nine years, including the Flaxbourne River, the Taylor River and Spring Creek. The greatest changes in turbidity are observed in the Awatere River, with significant increases at both sampling sites. Rivers in the northern part of the region showed increased Soluble Inorganic Nitrogen concentrations. The wide-spread nature of this phenomenon suggests changes in rainfall patterns are the cause, while decreasing trends of Soluble Inorganic Nitrogen concentrations in spring-fed rivers in the Wairau Plain is most likely linked to the conversion of pasture into vineyard. Council monitoring has shown that significantly less nitrogen is lost to groundwater under vineyard, compared to pasture.