

Surface Water Quality - Monitoring 2022

Key Points

- ◆ Water quality of streams and rivers in the Marlborough region is monitored monthly at 35 sites.
- ◆ This Report Card is an update on the state of water quality.
- ◆ Three years of monitoring data is combined to calculate Water Quality Indices. These allow reporting using water quality categories, ranging from excellent to poor.
- ◆ For all sites, changes to the Water Quality Index compared to the Indices reported in the previous year were minor.
- ◆ A more in-depth analysis of river water quality can be found in the 2020 State of the Environment report available on the Council website.

Surface Water Quality Monitoring

Marlborough District Council monitors 35 stream and river sites across the region on a monthly basis. The results of the monitoring are used to report on the State of the Environment as required by central government legislation. The monitoring also helps Council to assess the effectiveness of its management of natural resources through regional rules and non-regulatory methods.

This Report card presents an update on the water quality of the region's rivers and streams using a Water Quality Index. A more in-depth analysis of states and trends as well as reporting on attributes of the National Policy Statement for Freshwater Management can be found in the *State of the Environment Surface Water Quality Monitoring Report 2020* available on the Marlborough District Council website.

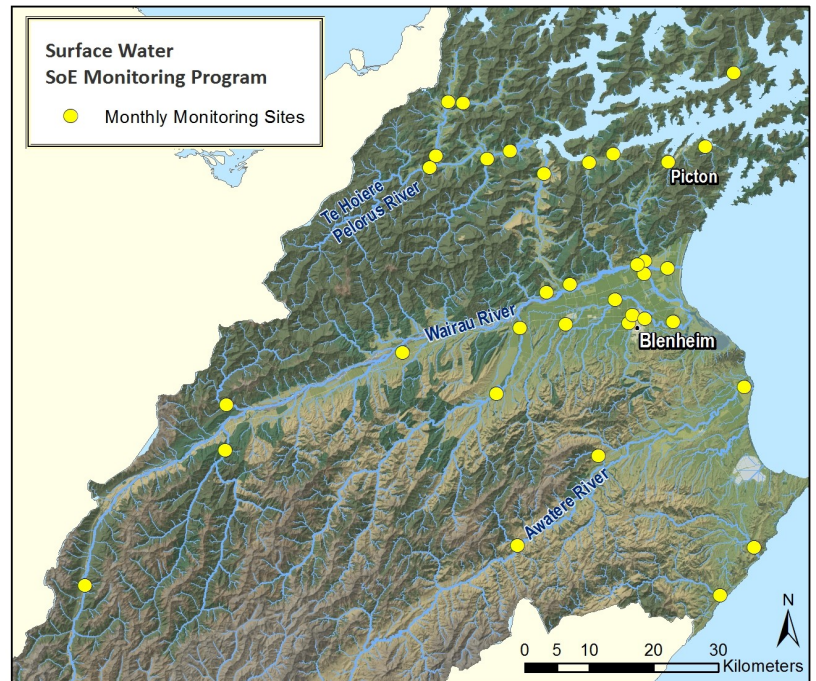


Figure 1: Map of sampling sites.

What We Measure and Why

At each site a number of parameters are monitored. Some parameters are measured in the field, while others are analysed from samples sent to an independent laboratory. Nine of these parameters are used for the reporting on the state of water quality:

- **Water Temperature and Dissolved Oxygen**

High Water Temperatures and low Dissolved Oxygen levels effect the survival of aquatic insects and fish.

- **pH**

Deviations from natural pH values can impact the growth and reproduction of fish, and in extreme cases cause fish kills.

- **E. coli concentration**

E. coli are an indicator for faecal contamination, which has negative affects on aquatic ecosystems and presents a health risk to recreational users.

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

These are the forms of Nitrogen and Phosphorus that are easily taken up by plants. High concentrations lead to excessive algae growth, which impacts aquatic habitat quality and oxygen levels.

- **Nitrate Nitrogen and Ammonia Nitrogen**

High concentrations of these forms of Nitrogen are toxic to aquatic life.

- **Turbidity**

Turbidity is a measure for sediment in the water. Fine sediment affects the growth of aquatic insects and fish. When sediment settles on river beds, it smothers habitats and degrades food sources. Reduced water clarity also impacts on the recreational values of rivers.

The Water Quality Index

To report on the state of surface water quality, data from three consecutive years is used to calculate a Water Quality Index for each site. The index is a number between 0 and 100, with higher values representing better water quality. It allows categorisation of water quality into five classes. The classes “excellent”, “good” and “fair” represent acceptable water quality. Streams and rivers in the “marginal” and “poor” categories require improvements. These waterways are included in the Catchment Care programme which aims to enhance water quality in collaboration with landowners.

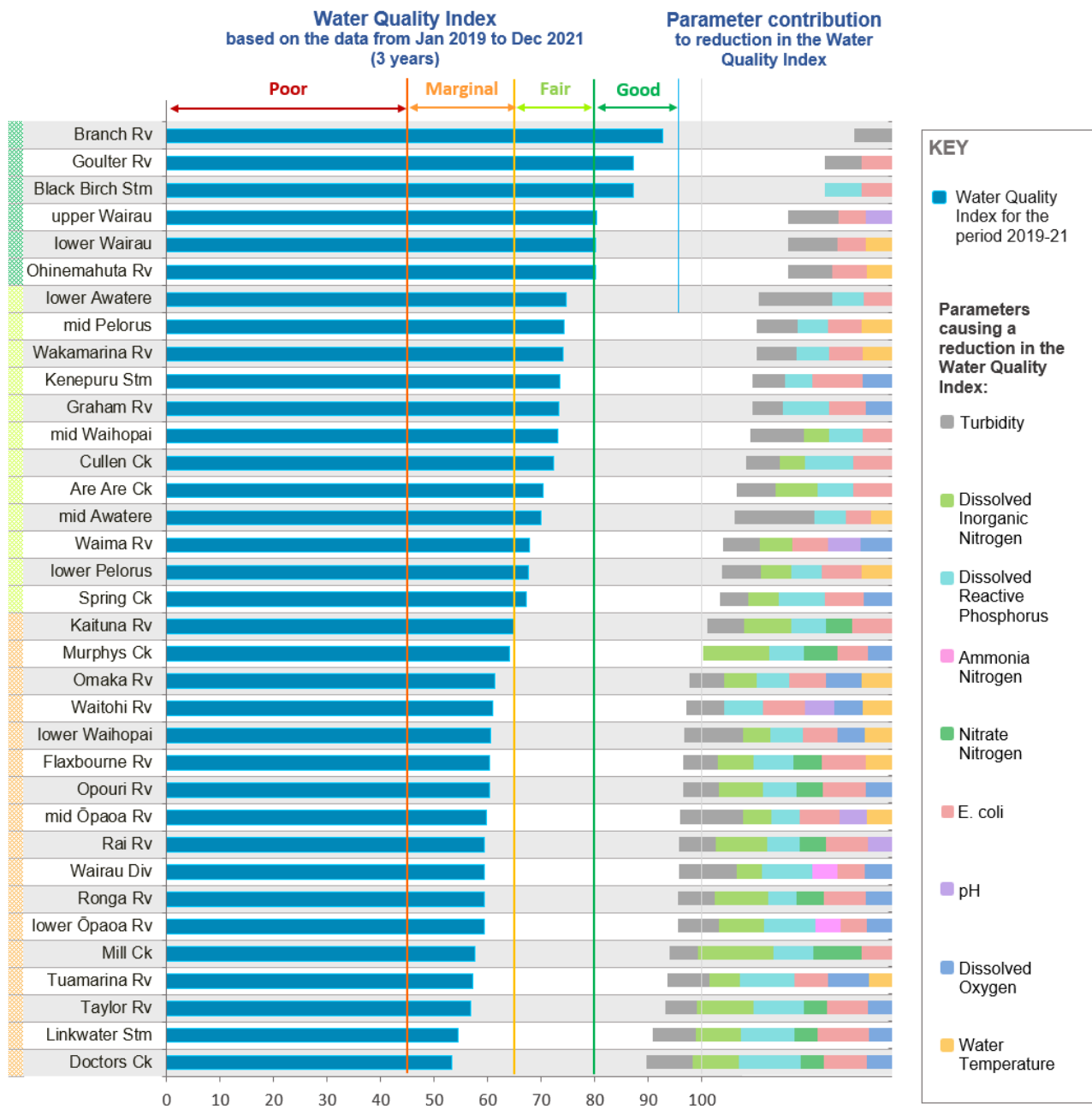


Figure 2: Water Quality Indices for the period 2019-2021 and the parameters contributions to the reduction in the indices.

Figure 2 shows the Water Quality Indices for the 2019-2021 monitoring period. Most rivers had good or fair water quality, but there are a number of waterways with Indices in the marginal category.

Water Quality Indices changed very little compared to the indices reported in the previous year. For all waterways the changes to the index were less than 7 points. In fact, for more than 60% of monitoring sites the index changed by less than 1 point. For the remaining sites, a slight improvement was observed at five sites, while at seven sites the Water Quality Index decreased somewhat. The majority of the reductions were due to an increase in nitrogen concentrations. These were caused by higher rainfall, which resulted in greater leaching losses.