



Surface Water Quality - Monitoring 2021

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 the majority of monitoring sites, changes to the Water Quality Index were minor when compared to the Indices reported in the previous year.
- ◆ The greatest changes were a notable reduction in the Index for the Waitohi River and an improvement in the water quality of Doctors Creek.

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* on the Marlborough District Council website.



Figure 1: Map of sampling sites in Marlborough.

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 the sediment settles on the river bed, 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. The index allows categorisation into five water quality classes. The classes “excellent”, “good” and “fair” represent acceptable water quality. Streams and rivers in the “marginal” and “poor” categories are included in the Catchment Care programme which aims to improve water quality in collaboration with landowners.

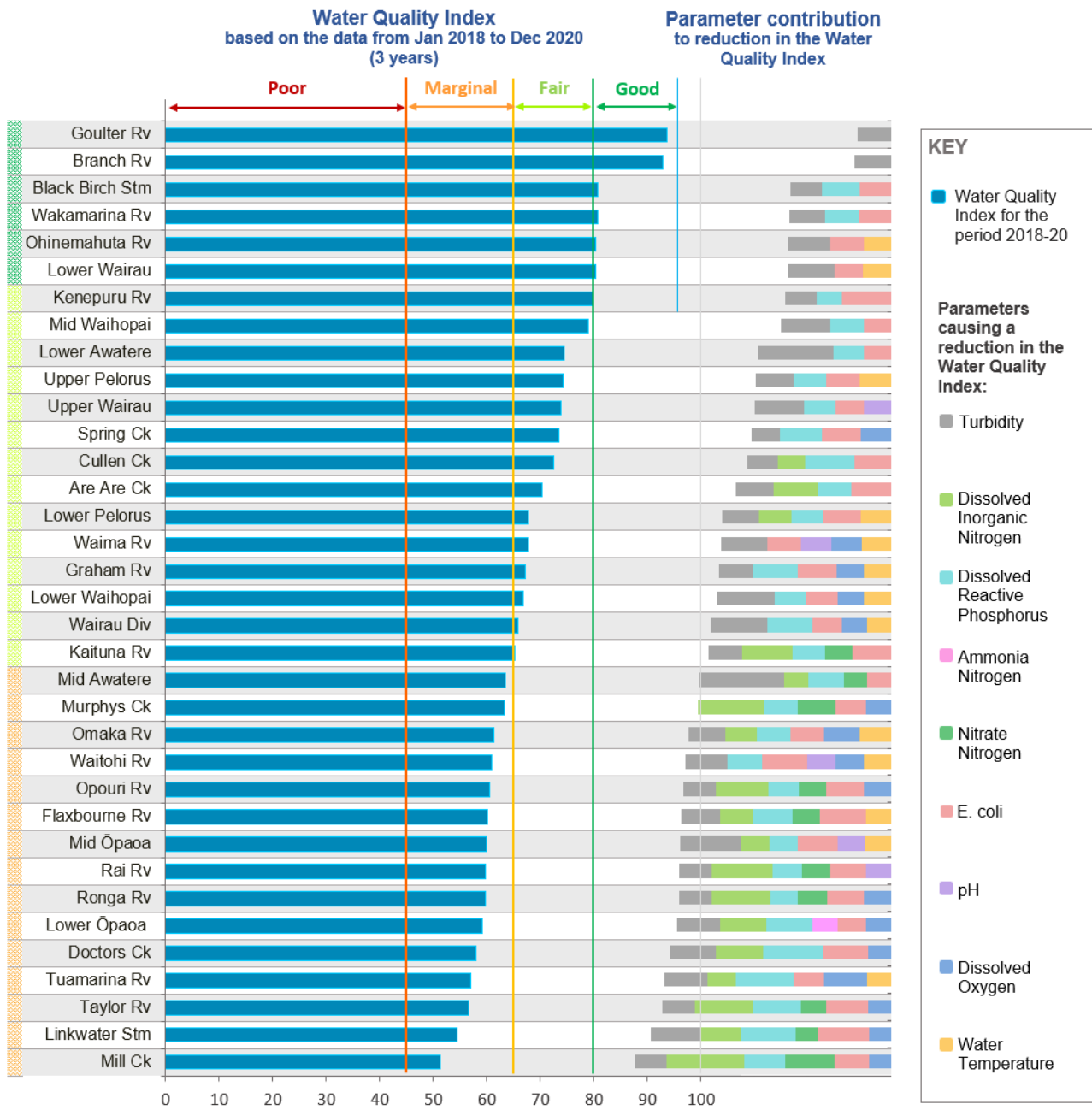


Figure 2: Water Quality Indices for the period 2018-2021 and the parameters contributions to the reduction in the indices.

Figure 2 shows the Water Quality Indices for the 2018-2020 monitoring period. Most rivers have good or fair water quality, but there are a number of waterways with Indices in the marginal category.

Water Quality Indices were mostly similar to those reported in the previous year. For the majority of sites the Index changed by less than five points. The largest changes were observed for the Waitohi River and Doctors Creek. The Water Quality Index for the Waitohi River fell by 18 points due to poor water quality during very low flows in February 2020. The Water Quality Index for Doctors Creek increased by 11 points. This was the results of improvements for a number of parameters, but most notably reductions in Nitrate and Ammonia concentrations.