

Water quality in Otago's lakes, rivers and aquifers



The Shotover River at McLeods Bluff.

Earlier this year, ORC completed two comprehensive state of the environment reports on the quality of lake and river water and groundwater in Otago.

The first report outlines the states and trends of water quality throughout Otago's lakes and rivers, covering a 20-year period from 2000 to 2020. It analyses 10 water quality variables and indicators relative to nationwide targets at over 120 monitoring sites in Otago: 110 river sites, and 22 sites and depths at nine lakes.

General Manager Strategy, Policy and Science Gwyneth Elsum said the information in the report was valuable for ORC and the wider community, as it updates our knowledge of water quality across Otago.

"This report largely reflects the patterns we have seen in the past, which tell us that water quality is best in the headwaters and at higher elevations, but it suffers at sites in smaller, low-elevation streams that drain pastoral or urban catchments.

"That spatial pattern of water quality in Otago will inform the development of our

new Land and Water Regional Plan, which divides the region by catchment into freshwater management units, meaning we can set rules and objectives to protect the values specific to each part of the Otago.

"This information will also support ORC and the community to implement other water quality improvement initiatives," Ms Elsum said.

The report does not analyse the drivers for water degradation trends, due to the lack of detailed information that ORC currently holds on land use and land management changes at a local or catchment scale; this is likely to be addressed in the upcoming Land and Water Regional Plan.

You can review this report and other technical reports on our website: www.orc.govt.nz/technical-reports

Groundwater quality

Groundwater is water that has soaked and infiltrated deep in the ground through spaces and cracks in the soil, sand, and rock and pools in geological formations called aquifers.

Groundwater can be extracted from aquifers through bores or wells using surface or submersible pumps for agricultural and industrial purposes or for drinking water; it can also flow freely back to the surface as springs, seeps or wetlands.

The 2021 state of the environment groundwater report is the first of its kind for Otago and provides baseline information on a region-wide scale about the state of groundwater in Otago, combining data and analysis from 54 bores, dating back over thirty years in some cases.



Groundwater can flow freely to the surface in springs and wetlands.

Ms Elsum said the report highlighted that water quality issues varied greatly within the region.

“Groundwater quality was particularly degraded in parts of the Lower Clutha and North Otago areas, and was better in the Upper Clutha and Queenstown Lakes areas.

“E. coli accounted for the majority of poor results in the Lower Waitaki and Lower Taieri, nitrate concentrations were highest in North Otago and the Lower Clutha, and dissolved arsenic was detected primarily in the Upper Clutha, Queenstown Lakes, and Central Otago areas – likely derived from schist in the underlying geology,” she said.

“A majority of the monitoring bores – 75% – recorded elevated levels of E. coli above drinking water standards at some point in their monitoring history. While most of these recordings were not persistent, regular exceedances were found at bores in the Lower Taieri and Lower Waitaki areas.

“Not all of these bores are used for drinking water – with some used for monitoring, irrigation, and farm use. However, this consolidated overview of groundwater quality is a pertinent reminder that those on private drinking water supplies should test their bore water regularly and take steps to keep their bore head secure to avoid contamination,” Ms Elsum said.

In March 2021, ORC, Queenstown Lakes District Council and the Southern District Health Board held a public meeting for private water suppliers covering agency responsibilities and answered questions for private water suppliers. Incoming Chief Executive for the new water regulator Taumata Arowai also presented. This was filmed and can be viewed on the ORC website.

To access the State of the Environment Groundwater quality report, a bore specification guide for drillers and private suppliers, and to watch the recording of the public meeting, head to our website www.orc.govt.nz/groundwater



Sampling Lake Wānaka at Roys Bay looking towards Mt Alta.