Otago Rivers & Lakes Water Quality

Schedule 15 Report 2025

Otago Regional Council

Introduction

Otago Regional Council carries out routine water quality testing at over 100 sites across the region as part of its State of the Environment (SoE) monitoring programme. This report card summarises the results for the five-year period from July 2020 to June 2025, assessed against the Schedule 15 water quality limits in the operative Regional Plan: Water for Otago.

Water Quality Monitoring Limits and Targets

Monthly water samples are collected at 105 river sites and 8 lake sites to test for the following parameters:

- **Nutrients -** Nitrite–nitrate nitrogen (NNN) and dissolved reactive phosphorus (DRP) are biologically available nutrients that drive algae and plant growth. NNN mainly comes from land drainage, while DRP typically originates from effluent and fertiliser runoff. Ammoniacal nitrogen (NH_4-N) indicates effluent contamination and can be toxic at high levels. Total nitrogen (TN) and total phosphorus (TP) are used to assess overall nutrient loads and eutrophication risk in lakes.
- ***Escherichia coli*** (*E. coli*) – high levels of these bacteria indicate faecal contamination from human or animal sources and are used to assess health risks and suitability of water for recreation and stock drinking.
- **Turbidity –** measures water cloudiness caused by suspended particles. High turbidity reduces light for photosynthesis and deposited sediment can smother streambed habitats, affecting macroinvertebrates and fish spawning.

Schedule 15 of the Regional Plan: Water for Otago sets out the numerical limits and targets for achieving acceptable water quality for all catchments in the Otago region. Based on the frequency of flushing flows rivers are categorised as Group 1 (more flushing flows) or Group 2 (fewer flushing flows) with Upper Clutha/Mata-Au sites in Group 3 based on the exceptional water quality in this area. Groups 4 and 5 represent small and large lakes respectively. Specific limits and targets for each group (Table 1) reflect the influence of differences in river flows and land cover type on expected water quality.

Table 1. Water quality limits and targets (5-year 80th percentile, when flows are at or below median flow) *

Schedule 15	NH_4-N mg/l	NNN mg/l	DRP mg/l	TN mg/l	TP mg/l	*E. coli* cfu/100ml	Turbidity NTU
Group 1	0.10	0.444	0.026			260	5
Group 2	0.10	0.075	0.010			260	5
Group 3	0.01	0.075	0.005			50	3
Group 4	0.10			0.55	0.033	126	5
Group 5	0.01			0.10	0.005	10	3

5-year 80th percentile when flows are at or below median flow means results are based on five years of monthly water quality samples, but only include the samples taken during normal flow conditions—not during high flows or floods. Removing high-flow samples avoids the big spikes in contaminants that happen during storms. From the remaining samples, the 80th percentile is calculated, which is the value that 80% of those samples are below (and 20% exceed).

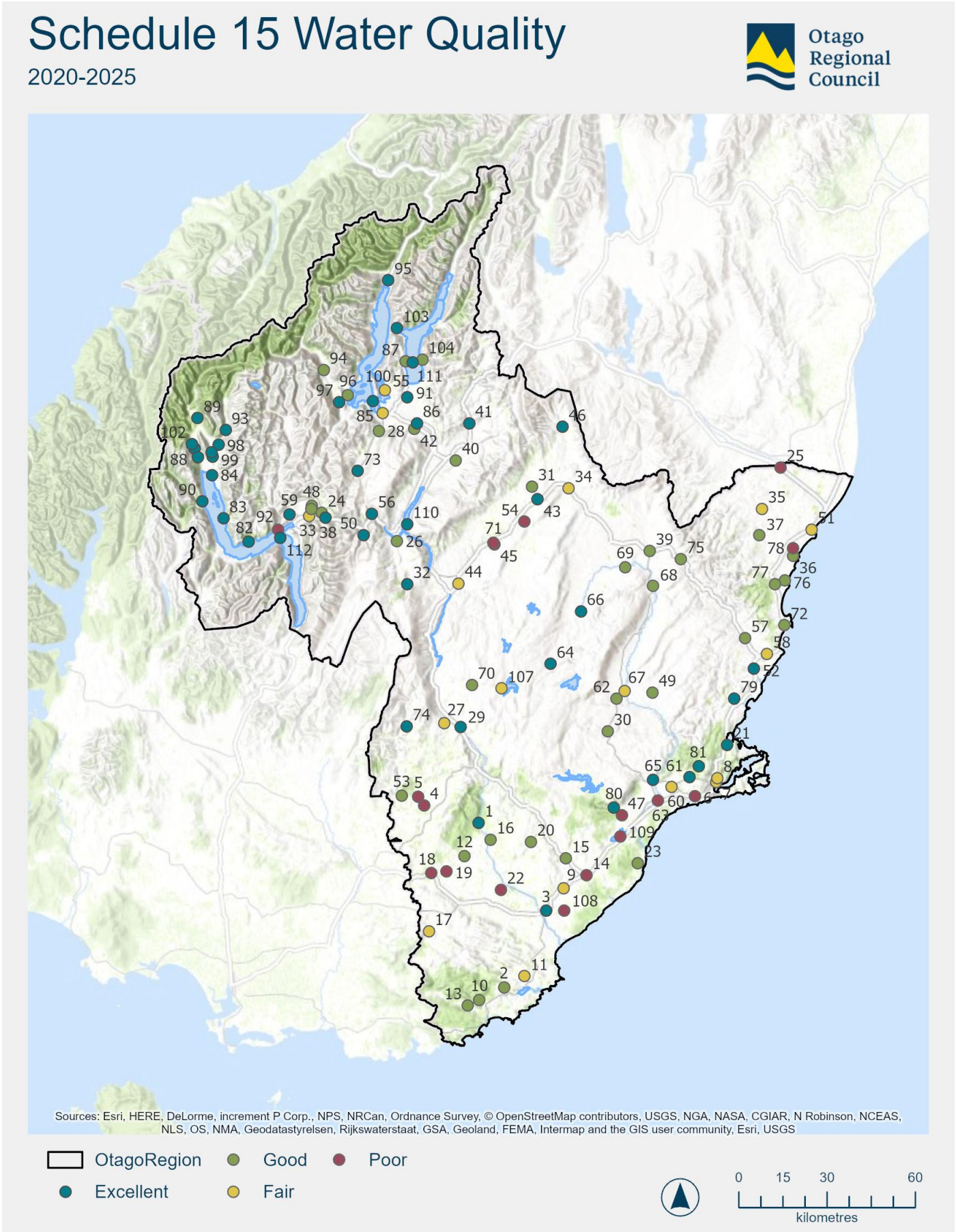

Figure 1. SoE water quality monitoring results 2020-2025. Site numbers and overall grades (alongside 80th values at or below median flows for each parameter) are shown in Tables 3-7.

Table 2. ORC Water Quality Reporting Index

Grade	Number of parameters complying with Schedule 15 limits and targets
Excellent	All five parameters comply
Good	Four of five values comply
Fair	Three of five values comply
Poor	Two or fewer values comply

Monitoring results for each parameter are assessed against the Schedule 15 limits. ORC uses a water quality index to classify each site into one of four groups based on the number of parameters which comply with the limits (Table 2). A summary of results for the Otago Region is shown in Figure 1.

Water Quality Results – Group 1 (More flushing flows)

- Fair or poor water quality at 12 of 22 sites (55 %)
- Good or excellent water quality at 10 of 22 sites (45 %)
- Sites with poor water quality include tributaries of the Pomahaka, the Waiwera River, and Dunedin urban streams
- Schedule 15 limits were most often exceeded for *E. coli* (86 % of sites did not meet limit) and NNN (55 % of sites did not meet limit)

Table 3. Water quality results for Group 1 (more flushing flows) sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit (5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets); (N) = site monitored by NIWA.

#	Site Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	NNN mg/L	DRP mg/L	*E. coli* cfu/100 ml	Turbidity NTU
			0.1	**0.444**	**0.026**	**260**	**5**
1	Blackcleugh Burn at Rongahere Rd	Excellent	0.006	0.125	0.022	121	1.8
2	Catlins River at Houipapa	Good	0.014	0.403	0.013	435	3.4
3	Clutha River at Balclutha (N)	Excellent	0.003	0.092	0.001	101	1.7
4	Crookston Burn at Kelso Rd	Poor	0.028	1.003	0.049	2038	4.5
5	Heriot Burn at Park Hill Rd	Poor	0.021	1.155	0.040	1334	4.4
6	Kaikorai Stream at Brighton Rd	Poor	0.020	0.558	0.015	4427	5.5
7	Leith at Dundas Street Bridge	Fair	0.012	0.488	0.024	1300	3.1
8	Lindsays Creek at North Rd Bridge	Fair	0.014	0.646	0.020	1120	3.5
9	Lovells Creek at Station Rd	Fair	0.020	1.026	0.015	590	2.6
10	Maclennan River at Kahuiku School Rd	Good	0.013	0.018	0.013	293	2.4
11	Owaka River at Katea Rd	Fair	0.017	0.856	0.020	413	3.2
12	Pomahaka River at Burkes Ford	Good	0.020	0.333	0.012	327	3.1
13	Tahakopa River at Tahakopa	Good	0.012	0.263	0.008	727	3.8
14	Tokomairiro River at Blackbridge	Poor	0.050	0.550	0.028	3590	11.8
15	Tokomairiro River West Branch Bridge	Good	0.014	0.315	0.012	505	2.4
16	Tuapeka River at 700m u/s bridge	Good	0.010	0.154	0.026	261	2.6
17	Waipahi River at Cairns Peak	Fair	0.018	0.548	0.018	660	4.9
18	Waipahi River at Waipahi	Poor	0.013	0.769	0.027	286	1.9
19	Wairuna River at Millar Rd	Poor	0.080	1.076	0.169	1813	13.4
20	Waitahuna River at Tweeds Bridge	Good	0.011	0.181	0.015	363	2.9
21	Waitati River at Mt Cargill Rd	Excellent	0.003	0.011	0.003	238	1.0
22	Waiwera River at Maws Farm	Poor	0.019	0.779	0.045	458	3.0

Water Quality Results – Group 2 (Fewer flushing flows)

- Excellent water quality at 19 of 59 sites, and Good water quality at a further 24 sites (73 % of sites graded Excellent or Good)
- Most sites with Excellent water quality are upper catchment sites across the region
- Fair water quality at nine sites
- Poor water quality at seven sites
- Schedule 15 limit most frequently exceeded for NNN (24 sites) and *E. coli* (21 sites)

Table 4. Water quality results for Group 2 (fewer flushing flows) sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit (5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets); (N) = site monitored by NIWA.

#	Site Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	NNN mg/L	DRP mg/L	*E. coli* cfu/100ml	Turbidity NTU
			0.1	**0.075**	**0.01**	**260**	**5**
23	Akatore Creek at Akatore Creek Road	Good	0.011	0.977	0.005	152	1.0
24	Arrow at Morven Ferry Road	Good	0.003	0.173	0.001	79	1.1
25	Awamoko at SH83	Poor	0.009	0.638	0.075	361	1.0
26	Bannockburn at Lake Dunstan	Good	0.004	0.001	0.004	130	5.2
27	Benger Burn at Booths	Fair	0.009	0.054	0.013	1068	1.3
28	Cardrona at Mt Barker	Good	0.005	0.115	0.001	157	1.2
29	Clutha at Millers Flat	Excellent	0.003	0.044	0.001	47	1.4
30	Deep Stream at SH87	Good	0.006	0.001	0.002	387	0.8
31	Dunstan Creek at Beattie Road	Good	0.004	0.104	0.003	178	0.9
32	Fraser at Old Man Range	Excellent	0.003	0.027	0.003	29	0.3
33	Hayes Creek at SH6	Fair	0.034	0.010	0.023	299	2.4
34	Hills Creek at SH85	Fair	0.003	0.250	0.004	409	1.3
35	Kakanui at Clifton Falls Bridge	Fair	0.003	0.088	0.001	500	0.5
36	Kakanui at McCones	Good	0.015	0.766	0.003	119	0.5
37	Kauru at Ewings	Good	0.007	0.026	0.003	356	0.3
38	Kawarau at Chard Road	Excellent	0.009	0.021	0.000	29	1.8
39	Kye Burn at SH85 Bridge	Good	0.004	0.075	0.004	165	2.0
40	Lindis at Ardgour Road Bridge	Good	0.003	0.446	0.001	172	0.8
41	Lindis at Lindis Peak	Excellent	0.004	0.049	0.002	110	1.4
42	Luggate Creek at SH6 Bridge	Good	0.004	0.009	0.011	157	1.2
43	Manuherikia at Blackstone Hill	Excellent	0.004	0.008	0.003	245	5.0
44	Manuherikia at Galloway	Fair	0.010	0.063	0.014	291	2.4
45	Manuherikia at Ophir	Poor	0.019	0.108	0.028	635	2.6
46	Manuherikia downstream of Fork	Excellent	0.003	0.004	0.003	23	0.4
47	Meggat Burn at Berwick Road	Poor	0.013	0.097	0.013	414	2.2
48	Mill Creek at Fish Trap	Good	0.011	0.510	0.005	143	4.0
49	Nenthorn at Mt Stoker Road	Good	0.013	0.004	0.019	81	1.8
50	Nevis at Wentworth Station	Excellent	0.002	0.005	0.003	58	1.1
51	Oamaru Creek at SH1	Fair	0.021	0.623	0.341	258	1.7
52	Pleasant River at Patterson Road Ford	Excellent	0.008	0.007	0.004	56	4.8
53	Pomahaka at Glenken	Good	0.005	0.020	0.007	335	1.0

Water Quality Results – Group 2 (continued)

Table 4 (continued). Water quality results for Group 2 (fewer flushing flows) sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit (5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets); (N) = site monitored by NIWA; + = site exempt from turbidity limit.

#	Site Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	NNN mg/L	DRP mg/L	*E. coli* cfu/100ml	Turbidity NTU
			0.1	**0.075**	**0.01**	**260**	**5**
54	Poolburn at Cob Cottage	Poor	0.012	0.091	0.054	302	1.4
55	Quartz Reef Creek at SH8	Good	0.003	0.003	0.002	440	1.4
56	Roaring Meg at SH6	Excellent	0.003	0.035	0.010	91	0.7
57	Shag at Craig Road	Good	0.005	0.127	0.003	125	0.5
58	Shag at Goodwood Pump	Fair	0.014	0.310	0.005	285	0.7
59	Shotover at Bowens Peak (N) +	Excellent	0.004	0.013	0.001	15	(6.2) +
60	Silverstream at Taieri Depot	Fair	0.007	0.437	0.004	290	1.0
61	Silverstream at Three Mile Hill Road	Excellent	0.003	0.004	0.002	134	0.7
62	Sutton Stream at SH87	Good	0.010	0.008	0.008	489	1.4
63	Taieri at Allanton Bridge	Poor	0.018	0.084	0.010	579	4.1
64	Taieri at Linnburn Runs Road	Excellent	0.006	0.004	0.002	232	1.8
65	Taieri at Outram	Excellent	0.007	0.025	0.008	115	2.9
66	Taieri at Stonehenge	Excellent	0.006	0.011	0.006	86	1.7
67	Taieri at Sutton	Fair	0.012	0.064	0.012	564	3.9
68	Taieri at Tiroiti	Good	0.004	0.060	0.018	165	2.9
69	Taieri at Waipiata	Good	0.013	0.047	0.033	218	2.6
70	Teviot at Bridge Huts Road	Good	0.006	0.004	0.002	176	5.1
71	Thomsons Creek at SH85	Poor	0.027	0.605	0.099	1125	5.6
72	Trotters Creek at Mathesons	Good	0.038	0.516	0.007	162	2.4
73	Upper Cardrona at Tuohys Gully Road	Excellent	0.003	0.014	0.001	132	1.5
74	Upper Pomahaka at Aitchison Runs Road	Excellent	0.003	0.011	0.006	255	0.4
75	Upper Shag at SH85 Culvert	Good	0.003	0.014	0.002	433	0.3
76	Waianakarua at Browns	Good	0.004	0.562	0.002	123	0.2
77	Waianakarua at South Branch SH1	Good	0.007	0.906	0.002	176	0.4
78	Waiareka Creek at Taipo Road	Poor	0.015	0.589	0.271	311	1.1
79	Waikouaiti at 200m d/s DCC intake	Excellent	0.004	0.033	0.001	107	0.8
80	Waipori at Waipori Falls Reserve	Excellent	0.008	0.053	0.006	80	3.3
81	Whare Creek at Whare Flat Road	Excellent	0.005	0.028	0.004	65	1.8

Water Quality Results – Group 3 (Upper Lakes sites)

- Excellent water quality at 17 sites and Good water quality at four sites (88 % of Group 3 sites)
- Fair water quality at two sites
- Poor water quality at one site – Horn Creek exceeds limits for multiple parameters, similar to urban sites elsewhere in Otago
- Horn Creek is the only river site in the region to exceed the ammoniacal nitrogen limit
- Schedule 15 limits were most often exceeded for *E. coli* and NNN

Table 5. Water quality results for Group 3 sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit (5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets); * = sites monitoring < 5 years, grade is interim; + = site is exempt from turbidity limit.

#	Site Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	NNN mg/L	DRP mg/L	*E. coli* cfu/100ml	Turbidity NTU
			0.01	**0.075**	**0.005**	**50**	**3**
82	12 Mile Creek at Glenorchy Queenstown Rd	Excellent	0.003	0.006	0.003	10	0.2
83	25 Mile Creek at Glenorchy Queenstown Rd	Excellent	0.003	0.010	0.005	17	0.6
84	Buckler Burn at Glenorchy Queenstown Rd	Excellent	0.001	0.046	0.001	7	1.4
85	Bullock Creek at Dunmore Street Footbridge	Fair	0.003	0.847	0.001	775	0.5
86	Clutha at Luggate Bridge	Excellent	0.004	0.049	0.001	18	0.7
87	Craig Burn at SH6	Good	0.003	0.014	0.003	82	0.6
88	Dart at The Hillocks +	Excellent	0.003	0.032	0.002	13	(24.9) +
89	Dundas Creek at Mill Flat	Excellent	0.003	0.051	0.003	2	0.3
90	Greenstone at Greenstone Station Rd	Excellent	0.003	0.021	0.002	20	0.4
91	Hawea at Camphill Bridge	Excellent	0.002	0.027	0.001	14	0.5
92	Horn Creek at Queenstown Bay	Poor	0.017	0.220	0.008	410	1.2
93	Invincible Creek at Rees Valley Rd	Excellent	0.001	0.010	0.001	2	0.8
94	Leaping Burn at Wanaka Mt Aspiring Rd	Good	0.003	0.026	0.002	168	0.3
95	Makarora at Makarora	Excellent	0.003	0.058	0.001	32	0.5
96	Matukituki at West Wanaka +	Good	0.008	0.089	0.004	39	(1.5) +
97	Motatapu at Wanaka Mt Aspiring Road	Excellent	0.003	0.052	0.001	31	0.8
98	Ox Burn at Rees Valley Road	Excellent	0.003	0.022	0.002	11	1.3
99	Precipice Creek at Glenorchy Paradise Rd	Excellent	0.003	0.007	0.002	13	0.2
100	Quartz Creek at Maungawera Valley Rd	Fair	0.003	0.129	0.002	192	0.3
101	Rees at Glenorchy Paradise Road Bridge	Excellent	0.003	0.016	0.001	6	2.1
102	Scott Creek at Routeburn Rd	Excellent	0.003	0.035	0.001	13	0.5
103	The Neck Creek at Meads Rd	Excellent	0.003	0.004	0.002	24	0.2
104	Timaru Creek at Peter Muir Bridge	Good	0.001	0.013	0.005	11	26.2
105	Turner Creek at Kinloch Rd	Excellent	0.003	0.053	0.002	11	0.2

Water Quality Results – Group 4 (Nutrient enriched lakes)

- Lake Hayes has good water quality and Lake Onslow has fair water quality based on Schedule 15
- Lake Hayes does not meet the Schedule 15 limits for total phosphorus and Lake Onslow does not meet the limits for total phosphorus and turbidity
- Trophic Level Index scores for Lake Hayes indicate the lake is eutrophic/very poor water quality and Lake Onslow is eutrophic/poor water quality.
- Lake Tuakitoto and Lake Waihola have poor water quality consistent with the supertrophic/'very poor' water quality status of these sites https://www.lawa.org.nz/explore-data/otago-region/lakes

Trophic Level Index is a commonly used measure of overall lake water quality. The score is calculated using four water quality measures – nutrients (total nitrogen, total phosphorus), water clarity and chlorophyll-*a* (the pigment that causes the green colour of plants which indicates how much algae a lake has) For more information see https://www.lawa.org.nz/learn/factsheets/lake-trophic-level-index/

Table 6. Water quality results for Group 4 (small lakes) sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit (5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets).

#	Site Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	TN mg/L	TP mg/L	*E. coli* cfu/100ml	Turbidity NTU
			0.1	**0.55**	**0.033**	**126**	**5**
106	Lake Hayes at Mid Lake 10m	Good	0.040	0.530	0.052	2	4.4
107	Lake Onslow at Boat Ramp	Fair	0.008	0.320	0.042	24	11.5
108	Lake Tuakitoto at Outlet	Poor	0.111	1.77	0.150	219	10.5
109	Lake Waihola at Waihola Mid	Poor	0.007	0.61	0.058	72	15.6

Water Quality Results – Group 5 (Large lakes)

- Excellent water quality at all the large lake sites (Group 5)
- Results reflect the trophic status of these lakes - microtrophic/very good water quality

Table 7. Water quality results for Group 5 (large lakes) sites; grey shading ( ) denotes parameter non-compliant with Schedule 15 limit 5-year, 80th percentile below median flow exceeded Schedule 15 limits and targets).

#	Name	Grade	Schedule 15 limit or target				
			NH4-N mg/L	TN mg/L	TP mg/L	*E. coli* cfu/100ml	Turbidity NTU
			0.01	**0.1**	**0.005**	**10**	**3**
110	Lake Dunstan at Dead Mans Point	Excellent	0.004	0.087	0.003	7	1.15
111	Lake Hawea South Open Water 10m	Excellent	0.003	0.046	0.002	0.5	0.66
112	Lake Wakatipu Open Water 10m	Excellent	0.003	0.061	0.002	0.5	0.59
113	Lake Wanaka Open Water 10m	Excellent	0.003	0.065	0.002	0.6	0.55

Summary

The proportion of sites achieving each water quality grade has remained largely unchanged over the past five years. (Table 8). Around 70 % of monitored sites consistently achieve 'excellent' or 'good' grades. Most of the sites with excellent river water quality were in Central Otago and the Upper Clutha Mata-Au catchments. In these areas, land-use tends to be low-intensity sheep farming and/or dominated by tussock lands. Poorer water quality was found in river catchments with higher-intensity farming/land-use or in streams draining urban environments.

Table 8. Summary of Schedule 15 water quality index results for Otago rivers and lakes for the last five reporting periods (2020-2025)

Grade	2015-20		2016-21		2017-22		2018-23		2019-24		2020-2025	
	Rivers	Lakes	Rivers	Lakes	Rivers	Lakes	Rivers	Lakes	Rivers	Lakes	Rivers	Lakes
Excellent	37	3	41	4	41	4	39	4	40	4	39	4
Good	34	3	32	2	31	2	34	2	35	2	35	1
Fair	19	0	17	0	17	0	16	0	15	0	16	1
Poor	16	2	17	2	17	2	17	2	15	2	15	2
Total	106	8	107	8	106	8	106	8	105	8	105	8

Compared to the 2024 report card, 102 sites retained the same grade, 4 sites moved up one grade and 7 sites moved down one grade. There were no changes to the monitoring schedule in 2024-25. Most grade changes involved small changes in 80th percentile values that were close to the limit value and therefore do not generally indicate any significant change in water quality. The most recent analysis of long trends in Otago Region water quality were reported in the **2023 State and Trends report**.

12 Mile Creek, Upper Lakes Rohe

The data reported here were current as of January 2026.

For more information about the State of Environment monitoring and reporting or the data presented here contact science.enquiries@orc.govt.nz or see our website - Reports and Publications – water quality

Water quality information for the Otago Region is also available at LAWA Land Air Water Aotearoa and on the ORC Environmental Data Portal