

Cyanobacteria at recreational bathing sites

This report analyses the suitability of recreational bathing sites for swimming based on concentrations of potentially toxic cyanobacteria as presented in Land, Air, Water, Aotearoa's (LAWA) recreational bathing raw water quality dataset. This is a supplement to the [recreational bathing surveillance report](#) inspired by a [recently reported case](#) of cyanotoxin poisoning in Canterbury.

Key facts

- During the 2023/24 bathing season, 59 of the 153 rivers and 13 of the 19 lakes sampled were found to be unsafe to swim because of their cyanobacteria content at least once.
- In the 2023/24 bathing season, 38 rivers and 11 lakes were found to be unsafe to swim due to the presence of potentially toxic cyanobacteria 20% of the time or more.
- The Taranaki region had the highest proportion of unsafe river sites in 2023/24, with all of the six sampled rivers containing dangerous levels of cyanobacteria 20% of the time or more. Meanwhile, the Waikato region had the greatest proportion of unsafe lakes by the same measure.

Cyanobacteria and health

Cyanobacteria are naturally occurring aquatic microorganisms. In the right conditions, typically involving slow-flowing water, warm temperatures and high quantities of dissolved nutrients in the water, cyanobacteria can rapidly multiply to form dense 'blooms' characterized by mats of algae-like material or suspended material drifting freely in the water. It is highly likely that climate change will increase the frequency of these blooms in areas where temperatures rise and annual rainfall declines.

Some varieties of cyanobacteria produce toxins that are harmful to human health when ingested, leading to nausea, diarrhoea and, in extreme cases, organ damage or death. Contact with the skin can also cause painful irritations and rashes similar to an allergic reaction. Children are particularly vulnerable to cyanotoxin poisoning as their smaller body mass reduces the minimum dose necessary for a reaction. It is generally advised to treat all blooms as toxic until proven otherwise (LAWA 2024b).

Diagnosed cases of cyanotoxin poisoning in humans are very rare in New Zealand, with fewer than five confirmed cases between 2005 and 2022 (Health New Zealand 2024). However, there is no test available that can *confirm* cyanotoxin poisoning, so diagnosis requires correct identification of symptoms together with a history of exposure and the elimination of other causes (BPAC 2020). It is possible that many more cases go undiagnosed where the person affected does not seek medical attention for minor symptoms.

Though the burden of cyanotoxin poisoning in humans is negligible, the impact on companion animals, especially dogs, is significant. An estimated 200 dogs died after exposure to toxic cyanobacteria in the decade between 2012 and 2022 (RNZ, 2022). Dogs are much more likely to ingest cyanotoxins as they enjoy playing and scavenging in the water. Meanwhile, livestock drinking from contaminated water sources may also be at risk of poisoning.

Cyanobacteria has been observed in all regions that look for it

As of the 2023/24 bathing season (October-March), only eight of New Zealand's 16 regions reported any data on cyanobacteria concentrations to LAWA. At least one recreational river or lake bathing site in each region was found to have potentially toxic cyanobacteria in quantities that would warrant caution. Seven of the eight regions were host to sites that were found to have cyanobacteria in outright unsafe concentrations on at least one occasion (Table 1). Only the Nelson region reported no 'unsafe' concentrations at any site, but this may reflect the small sample size.

Cyanobacteria was more common in lakes, with 13 out of 19 of those sampled being found unsafe to swim due to its presence on at least one occasion. Meanwhile, 59 out of 153 rivers were also unsafe to swim at least once during the bathing season.

Table 1: Monitoring results for the presence of cyanobacteria, by region, 2023/24

Region	Number of sampled sites*		'Caution advised' at least once		'Unsafe to swim' at least once	
	Rivers	Lakes	Rivers	Lakes	Rivers	Lakes
Northland	0	0				
Waikato	4	4	3	2	2	3
Bay of Plenty	2	5	2	5	2	5
Gisborne	0	0				
Hawke's Bay	6	0	1	0	4	0
Taranaki	6	7	1	4	6	4
Manawatū-Whanganui	65	3	20	2	22	1
Wellington	22	0	12	0	5	0
Nelson	4	0	1	0	0	0
Marlborough	0	0				
Tasman	0	0				
West Coast	0	0				
Canterbury	44	0	6	0	18	0
Otago	0	0				
Southland	0	0				
New Zealand	153	19	46	13	59	13

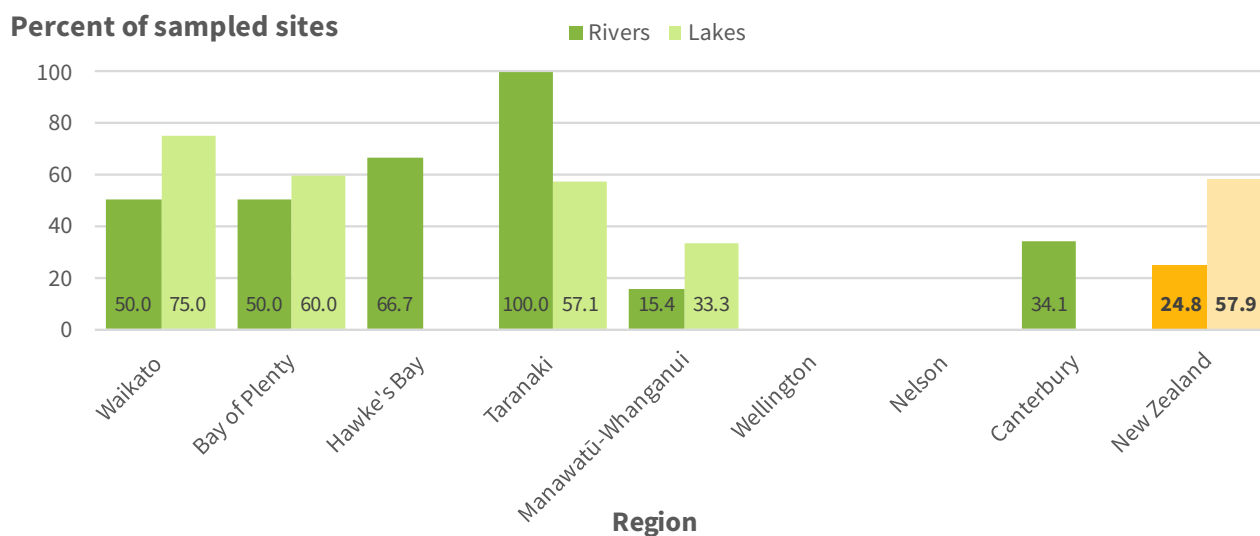
Note: (*) 'Sampled sites' refers to sites that were sampled for cyanobacteria, but not the total number of bathing sites sampled in the region. Sites that were only sampled for faecal indicator bacteria ([see our associated report](#)) do not count toward this number. The Auckland region reports no data at all to LAWA and has been excluded from this table.

Source: Land, Air, Water Aotearoa 2024a

Lakes were more likely to retain dangerous quantities of cyanobacteria

During the 2023/24 bathing season, 38 river sites (24.8% of those monitored) were found to be unsuitable for swimming on 20% or more of the occasions they were surveyed, along with 11 beach sites (58%). (Figure 2 & Table 2). Because lakes lack a constant flow of water, cyanobacteria are more likely to remain once established at a bathing site, with nothing to flush them away.

Figure 2: Percentage of sites that tested unsafe for swimming >20% of the time, 2023/24



Source: Land, Air, Water Aotearoa 2024a

Table 2: Sites with frequent unsafe cyanobacteria concentrations, by region, 2023/24

Region	Number of sites		Proportion of sites	
	Rivers	Lakes	Rivers	Lakes
Waikato	2	3	50%	75%
Bay of Plenty	1	3	50%	60%
Hawke's Bay	4	0	67%	0%
Taranaki	6	4	100%	57%
Manawatū-Whanganui	10	1	15%	33%
Wellington	0	0	0%	0%
Nelson	0	0	0%	0%
Canterbury	15	0	34%	0%
New Zealand	38	11	25%	58%

Source: Land, Air, Water Aotearoa 2024a

Data for this indicator

This indicator analyses the most recent data available from Land, Air Water Aotearoa (LAWA)'s recreational bathing dataset, published online in October 2024.

Data availability

Any region that does not supply water quality sampling results for cyanobacteria to LAWA has been excluded from all analyses in this factsheet.

Grading of sites

A grade is assigned to every measurement based on the concentration of cyanobacteria at the time of measurement. The sampling method varies depending on the type of site or cyanobacteria, as detailed in the table below. Sampling is usually conducted at least once per week during the summer bathing season (the last week in October to the end of March). Grades are assigned to each measurement as below (LAWA 2024c):

Grade	Criteria (benthic – most common in rivers)	Criteria (planktonic – most common in lakes)
Green – 'Suitable for swimming'	The site was safe to swim at the time of measurement Equal to or less than 20% coverage of cyanobacteria attached to substrate	Cyanobacteria cell count is less than 500 cells/mL OR total cyanobacteria biovolume is less than 0.5mm ³ /L
Amber – 'Caution advised'	Caution would be advised before swimming. Between 20–50% coverage of cyanobacteria attached to substrate	Potentially toxic cyanobacteria biovolume is between 0.5mm–1.8mm ³ /L OR total cyanobacteria biovolume is between 0.5mm–10mm ³ /L
Red – 'Unsuitable for swimming'	The site was not safe to swim at the time of measurement. More than 50% coverage of cyanobacteria attached to substrate, or cyanobacteria are visibly detaching and accumulating on the river's edge / becoming exposed on river edge when river level drops.	<ul style="list-style-type: none"> • Potentially toxic cyanobacteria biovolume is between 0.5mm–1.8mm³/L • Total cyanobacteria biovolume is between 0.5mm–10mm³/L • Total microcystins more than 12µg/L • Cyanobacterial scums are consistently present

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Citation

Environmental Health Intelligence. 2025. *Cyanobacteria at recreational bathing sites*. [Surveillance Report supplement]. Wellington: Environmental Health Intelligence NZ, Massey University.

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