



What are cyanobacteria?

Cyanobacteria (commonly known as “blue-green algae”) are among the oldest and most primitive forms of life. They are found in fresh water lakes and rivers throughout the world, usually in low concentrations, and are not visible without the use of a microscope. However, when conditions are favourable, cyanobacteria cells can multiply and form cyanobacteria blooms or cyanobacterial mats. These may also accumulate to form surface scums in shallow inlets and bays and along the shoreline of lakes and rivers.

Favourable conditions for cyanobacteria blooms include the right combination of warm temperatures, sunlight, and low (or stable) river flows, or calm lake conditions. Cyanobacteria blooms are a natural phenomenon but human activities, such as taking water from rivers or adding nutrients to waterways, can increase the risk of blooms occurring. In particular, high levels of nutrients such as phosphorus and nitrogen increase the risk of blooms occurring. These nutrients may reach waterways from sources such as fertiliser use, livestock, and sewage leakage or discharge in lake and river catchment areas.

What are the health risks of cyanobacteria?

Blooms of cyanobacteria frequently are associated with a range of health risks. People can be exposed to cyanobacteria by drinking affected water, swallowing or inhaling droplets while swimming, or through direct skin contact. Where there are visible cyanobacteria blooms, scum collections, or mats, the risk of exposure is much greater.

The reported health effects of cyanobacteria are varied but include gastrointestinal symptoms (such as diarrhoea, vomiting, abdominal pain), headaches, fever, muscle aches, joint aches, vertigo, influenza-like symptoms, fatigue, drowsiness, sore throats, conjunctivitis (red eyes), blistering around the mouth, itchy skin rashes, hay fever-like symptoms, and various allergic reactions. Conditions such as hay fever, eczema and dermatitis may also worsen and exposure to cyanobacteria may trigger an acute attack of asthma.

Cyanobacteria also often produce specific toxins that may damage the liver or are poisonous to the nervous system and these can be dangerous in high doses. Those at greatest risk of health effects are children and those with pre-existing medical conditions such as long-term liver or kidney disease.



The higher the concentration of cyanobacteria and cyanotoxins and the longer contact with the water, the more severe the symptoms are likely to be. Cyanobacteria surface scums and mats may contain very high concentrations of toxins and this may represent a specific risk to children who might be attracted to play with scums on the shoreline or in shallow areas of a lake or river.

What is a health warning for cyanobacteria?

Regional Councils regularly test fresh water (rivers as well as lakes) for cyanobacteria. If high concentrations of cyanobacteria are found, the Medical Officer of Health will issue a Health Warning advising the public not to drink or use affected water and to refrain from any contact with areas of the lake or river that have cyanobacteria blooms or mats. When a health warning is in place, people are advised not to paddle, wade, swim, fish, or participate in any recreational activity that might involve significant contact with these cyanobacteria blooms, scums, or mats. Health warnings also advise people to keep their pets (e.g. dogs) and livestock out of areas of lakes or rivers affected by blooms.

Anyone suffering illness after contact with cyanobacteria blooms should seek medical assistance. Any illness in pets or livestock after contact with the river should be reported to the Medical Officer of Health.

Current Health Warnings are posted on the Toi Te Ora - Public Health website http://www.toiteorapublichealth.govt.nz/health_warnings. In addition, Environment Bay of Plenty will post necessary information on their website, including maps of the affected areas. When a Health Warning is issued, the District Council arranges signage at points of public access to the affected area(s).

As it is not always possible to place signage at all parts of a river or lake that may be affected the public should be vigilant to look for and avoid using any areas that have visible bloom activity, cyanobacteria scums or mats.



What do cyanobacteria blooms look like?

Cyanobacteria blooms usually result in the water becoming a dense blue-green or brown colour. Floating scums may be visible when cyanobacteria are present in high concentrations. Cyanobacterial mats may form in rivers and around lake edges where they most often cover submerged rocks, sand, gravel logs and weed. Cyanobacterial mats are moss like in appearance, thickness and colour (dark brown/black) but have a much slimier texture and glisten when exposed to air. In shallow areas, the mats may appear bleached and take on a golden brown colour. The mats are easily dislodged from the riverbed and form floating 'rafts'. When cyanobacteria are present there is often a noticeable musty or 'earthy' odour.



Image of the toxic cyanobacterial mats. The cyanobacterial mats are the dark brown/black patches. The bright green mat is harmless green algae.

Cyanobacterial mat amongst stones at the edge of a river.

Lakes and rivers known to be at risk in the Bay of Plenty

Cyanobacteria are widespread throughout New Zealand and may occur in any lake or river, including those with relatively clean looking waters. In the past fifteen years cyanobacterial blooms (free living algae) have regularly occurred in several of the Rotorua Lakes (including Lake Rotorua and Rotoiti) Waikato River and occasionally in the Kaituna River and Lake Taupo. More recently cyanobacteria mats have been identified in parts of the Rangitaiki and Waimana Rivers in the Eastern Bay of Plenty.



Who should I call if I think I have found cyanobacteria?

Contact the Bay of Plenty Regional Council on 0800 ENV BOP (368 267) or after hours on the Pollution Hotline 0800 73 83 93 or Environment Waikato (07) 378 6539 (Taupo office) or on the Pollution Hotline 0800 800 401.

What is being done to get rid of the toxin-producing cyanobacteria?

There is little that can be done immediately to get rid of the cyanobacterial mats. Environment Bay of Plenty is looking into land use in affected catchments, to see if there is anything that can be done to reduce nutrient inputs to streams and rivers. Local councils and Toi Te Ora - Public Health are responsible for the issuing of health warnings and ensuring that the public are aware of the potential risks posed by these toxic cyanobacterial mats.

What do I do if my water supply comes from a stream, river or lake affected by cyanobacteria?

Check your intake (and also upstream) for the presence of cyanobacteria algae and contact your local council or a Health Protection Officer at Toi Te Ora - Public Health if you think your water supply may be affected. In rivers affected by cyanobacterial mats, it is important to keep your intake grates free of the mats by cleaning them frequently (making sure you do not touch the mats).

Normal household filtration or disinfection systems (e.g. the adding of household chlorine based disinfectants) do not effectively remove cyanobacterial toxins. Boiling the water is not recommended as boiling will cause the cyanobacteria cells to break open and will actually increase the available toxin concentration. So if your water may be affected, to ensure safety, close off your intake and find an alternative water supply. In the longer term you should look for an alternative source for your water supply. If there is no alternative water supply exists, slow sand filters containing bacteria capable of breaking down toxins have shown promise.

Reticulated town supply water is monitored and adequately treated.

Is it safe to swim in water with toxin-producing cyanobacteria?

No. You should avoid any skin contact with the water and avoid swallowing the water.

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Can I water my garden with water that contains toxin-producing cyanobacteria?

Yes. Fruit and vegetables do not appear to absorb the toxins. However, fruit and vegetables should be washed in clean water as the cyanobacteria may form a residue on the surface, which can remain toxic even when dry.

Where can I get more information?

Contact a Health Protection Officer at Toi Te Ora - Public Health for queries relating to human health and drinking water. Free phone 0800 221 555