Frequently asked questions and answers

What is an algal bloom?

An algal bloom occurs in a lake when the single-celled free-floating algae multiply to vast proportions. All species can form blooms. Blooms of diatoms and green algae frequently go unnoticed but are detected by analysis of samples. When cyanobacteria bloom (blue green algae), they create a health hazard because they can release chemicals into the water that are toxic to animals and humans. They are also noticeable because they can float on the surface where they can form slicks or scums.

Cyanobacterial blooms can be a nuisance for people because they restrict their activities on the lakes. Cyanobacterial blooms are usually associated with excess nutrient input to lakes but require warm calm periods of weather to allow their dominance of the water surface.

Have these algal blooms happened only recently?

Analysis of lake sediments show that cyanobacterial blooms have been present in our lakes for more than 100 years. In the 1960s, Lake Rotorua experienced severe cyanobacterial blooms that were like enamel paint floating on the lake surface. The government funded a large research effort to try to fix the lake.

The Bay of Plenty Catchment Board worked in the 1970s to fence off and retire from grazing all the streams flowing into Lake Rotorua and other lakes. Landowner cooperation in these works was voluntary.

The other major avenue to clean up Lake Rotorua was a proposal to divert the city's treated sewage effluent from discharge to the lake. A scheme to pipe the effluent to the Kaituna River was stopped by a recommendation of the Waitangi Tribunal. In 1991, effluent was treated through a nutrient removal process and discharged to irrigation in Whakarewarewa Forest.

From 1995, algal blooms became annual events on Lake Rotoehu and Okawa Bay at Lake Rotoiti. In late 2002 and 2003, blooms covered the whole of Lake Rotoiti and in 2004 Lake Rotorua again suffered lake-wide blooms.

What has caused the lakes problem?

Some causes of the lakes problem are:

- too many nutrients, particularly nitrogen and phosphorus flowing into the lakes.
- an increased mass of algae in the lakes as a result of the nutrient increase.
- an increased rate of oxygen loss in the lake bottom waters.
- build-up of nutrients in lake sediments released during low oxygen conditions in bottom water.
- weather conditions.

How big is the problem?

Solutions to fix the problem are likely to cost more than $150 million. There have been no human fatalities and few cases of sickness reported but the potential for this exists. Urgent action now will hopefully reduce costs in the future.

Whose fault is it? Farmers? Septic tanks?

One of the main problems is that there are too many nutrients and these come from a variety of sources including erosion, land use activity, fertiliser, animal

The Rotorua Lakes Problem

- Many of Rotorua's lakes have too many nutrients, caused by activities such as farming and residential settlement.
- These nutrients (nitrogen and phosphorus) feed algal growth, which degrades water quality.
- The Rotorua Lakes Protection and Restoration Action Programme is initially tackling water quality problems in five lakes in the Rotorua district
- Some long-term solutions focus on land management and include new wetlands, restricting nutrients "outflows" from properties, and changes in land use.
- More urgent solutions include sewerage reticulation, structures to divert flows, and the use of mineral products to lock up nutrients.

waste, septic tanks, sewage, stormwater, geothermal, springs, rain and internal lake sediments. There is no single cause – all activities contribute.

How long have you known about the problem?

Methods of reducing the nutrient load on the Rotorua lakes have been put in place since the 1960s. These were successful in containing the problem until the late 1990s. Environment Bay of Plenty's Regional Water and Land Plan plans to contain the problem into the future. Unfortunately, while improved treatment of sewage reduced nutrient loads, the increasing nitrate load from aged groundwater has seen lake water quality decline again in some lakes.

Why hasn't anyone done anything about it before now?

Much has been done and now further nutrient reduction needs to be carried out.

How long will it take to fix?

Lake management issues are complex. In some cases, the problem may get worse before it gets better because of land use practices from many years ago and their delayed impacts on old age groundwater. Actions being undertaken now should help to improve the situation gradually over several years. Some actions will have a faster result than others.

What effect will the solutions have on my rates?

Everybody in the Bay of Plenty contributes to the solutions through their regional council rates. Rotorua residents also contribute through district council rates and any targeted rates for new sewerage schemes. Central government is also helping with money to finance engineering works and sewerage systems. An ongoing partnership between central and local government is required.

Are we too late?

It is not too late to improve any of the Rotorua lakes. However, it will cost a lot of money and there are limits to how intensively we can use the land around lakes. Any use of the land that exports more nitrogen or phosphorus from the property may eventually lead to the lakes getting worse. Some current land practices will have to change. The lakes that are of lower quality will never be pristine, but the goal is that algal bloom problems will not occur.

How can I help?

- Maintain your septic tank well. Check Environment Bay of Plenty's on-site effluent treatment plan.
- Understand the issues. If you are a rural landowner learn about best management practices that can reduce nutrient leaching and implement them on your property.

What is happening now?

Work being carried out now includes:

- stream and lake edge protection fencing and planting,
- modelling of lake dynamics to find out the effects of suggested works on Lakes Rotorua and Rotoiti,
- implementation of engineering works, including sewerage reticulation and diversions,
- education on nutrient management for land owners,
- development of appropriate regulations,
- working parties to develop action plans for each lake,
- locking up of phosphorus in lake inflows with mineral products.

Who is doing what?

Environment Bay of Plenty, Rotorua District Council and Te Arawa Maori Trust Board have developed a strategy for dealing with the lakes' roles and responsibilities. They are also overseeing the development of action plans where community and organisation representatives become actively involved in working together to recommend actions to fix their lakes.

Algal Bloom

Do the scientists have the answer?

In essence, the answer is to reduce nutrient loads to the lakes. How to do that may be costly and may affect common activities. Therefore, the "answers" need to be put in context by community decisions within the available legal frameworks.

Is this happening to other lakes in New Zealand and the world?

This is common in other parts of New Zealand and the world because urban and agricultural development inevitably leads to an increased leaching of plant nutrients into the surrounding environment.

Why is the Purenga Stream black?

The lower Puarenga Stream is turbid because of geothermal inputs in the Whakarewarewa area. During high rainfall, dark-coloured stormwater runs off the mill site into the Waipa Stream, which is a tributary of the Puarenga Stream. Environment Bay of Plenty has required upgrading of stormwater on the mill site to reduce this problem.

How much do boat users contribute to the problem?

- There is minimal effect on lake quality if oil/fuel spillages and leakages are avoided. Sometimes fuel is spilt accidentally into the lake but this doesn't happen often and is usually cleaned up quickly.

- Boat owners can transfer pest weeds to lakes where particular species are currently absent if they travel from lake to lake without cleaning any debris from their boat trailer.

- Pest fish are absent from the Rotorua lakes at present but koi carp eggs could be transferred from infected waters by weeds on boat trailers.

Do wild birds pollute the lakes?

Swans and any wild fowl in large numbers can contaminate lake waters with excess bacteria making them unsuitable for bathing. Wild fowl are minor contributors to the overall nutrient load.

Do algal blooms affect fish?

Current research indicates that there are no adverse effects from eating fish from lakes affected by cyanobacterial blooms, however the organs should not be eaten as they absorb much higher toxin levels. Research on this is ongoing.

How will I know whether it is safe to swim in a lake?

1 Look for warning signs at lake boat ramps and jetties.

2 Listen to radio news broadcasts and check your local newspapers.

3 Phone Environment Bay of Plenty on 0800 ENV AUTO (368 288) extn 9851 and follow directions to the algal line. This has an automated message with the state of warnings dated at the last sampling date.

You could also ask the operator to transfer you to a staff member who can give you more information.

4 Visit www.envbop.govt.nz

5 If the lake has a green surface scum, do not swim.

6 If you cannot see your feet in the water at knee depth do not swim and exit the water straight away.

If there are no health warnings in place and the water looks clear, can I assume that it is safe to swim in or drink the water?

Health authorities advise against drinking lake water at any time. If you cannot see your feet in the water at knee depth do not swim and exit the water straight away.

How often does Environment Bay of Plenty sample the lakes and upgrade health warnings?

Environment Bay of Plenty staff monitor the Rotorua lakes each week during the period of greatest risk. For the rest of the year there is a lower frequency of monitoring.

The Medical Officer of Health issues health warnings based on the results of monitoring.

These are upgraded as changes occur in the lake circumstances.

Two clear samples are required before a clearance is issued so the warning can be in place after the bloom has apparently collapsed. However, a risk is still possible as toxins may remain in the water over this period.

Where can I get more information about the lakes?

- Websites – check www.envbop.govt.nz
- Telephone Environment Bay of Plenty on 0800 ENV BOP (368 267) to speak to someone or to obtain information brochures and newsletters.
- Call in at Rotorua District Council, 1061 Haupapa Street, Rotorua or Environment Bay of Plenty's Rotorua office at 1125 Arawa St, Rotorua.

For further information and advice, contact Environment Bay of Plenty:

Telephone: 0800 ENV BOP (368 267)
Facsimile: 0800 ENV FAX (368 329)
Pollution Hotline: 0800 73 83 93
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This fact sheet was last updated May 2005

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Destination Rotorua Rotorua District Council

Te Arawa Maori Trust Board