Nutrient overloading

Nutrients in waterways are essential for the growth of algae and aquatic plants but too much can destroy an ecosystem.

Nutrients in streams are essential for the growth of algae and macrophytes (aquatic plants) that are an important food source for many small invertebrates and fish. The main nutrients in waterways come in the form of inorganic nutrients (simple chemicals) called nitrogen (N) and phosphorus (P). However, only small amounts of each are required in a natural ecosystem and any additional increase of these nutrients in waterways can quickly become a nuisance by causing excessive algae and plant growth. Increases in nutrients are nearly always as a result of land use activities or direct discharges from industry. An increase in the available nutrients in waterways is called eutrophication, which can have severe environmental effects.

More information on different land use activities and their potential impacts on waterways

Both the concentration of nutrients and the means by which they enter a waterway vary greatly. Nutrients may enter from the surrounding catchment from erosion (e.g., when exposed soils are washed from the land into a river/stream after trees are cut down), from stock entering waterways, or from fertiliser applied to pasture or crops. Some nutrients will bind to sediment particles and enter streams from soil erosion. Other nutrients are water soluble and these leach from soils and into streams via groundwater. Nutrients may also enter in the form of leaves, woody debris, grass, and other organic materials. These decompose slowly and release nutrients over time, comprising an important source of food as well as creating habitat for stream invertebrates and fish.

More information about sediment

The nutrient status of a lake, stream, or river reflects the land use of the surrounding upstream catchment. Nutrients may be delivered to larger rivers or lakes by the myriad of smaller interconnecting streams that form a river network within a catchment area. Alternatively, a nutrient-rich lake may feed downstream rivers or streams with nutrients. The ability of a stream or river to process the nutrients present in stream water or nutrients entering from streamsides depends on a range of variables, such as water velocity and depth, catchment geology, benthic substrate (rocky or sandy), and the presence of streamside riparian vegetation.

More information about loss of riparian vegetation

Potential impacts of high nutrients on water quality and mahinga kai

- Eutrophication - excess nutrients in lakes, estuaries, or slow-moving streams and rivers can lead to an increase in primary productivity (excessive plant and algal growth) that degrades water quality.
- Loss of species - an increase in plant growth, sometimes called an algal bloom, reduces dissolved oxygen (DO) in the water when the algae die and decompose and can cause organisms (fish and invertebrates) to die. If this cycle happens repeatedly, species may be lost from the lake or waterway.
- Loss of habitat - eutrophication of the water can kill off plants that fish depend on for their habitat and alter the lake bed habitat for invertebrate species.
- Increased turbidity and decreased visibility - when algae increases in response to nutrients this reduces water clarity, visibility, and recreational suitability. It also reduces the ability of some fish to see prey or predators.

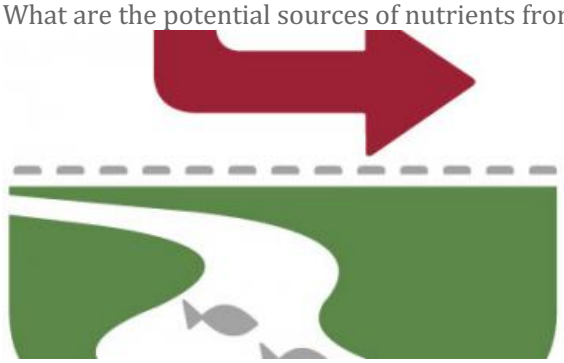
More information about eutrophication More information about dissolved oxygen

Eutrophication

Lakes and estuaries can be described by their nutrient status.

Causes of nutrient overloading

What are the potential sources of nutrients from land use activities?



Mitigation

Here are some simple steps to minimise the effects of nutrient overloading on water quality and

https://niwa.co.nz/our-science/freshwater/tools/kaitiaki_tools/impacts/nutrients