



# Focus

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## Nutrients in Our Lakes and Streams

### Issue

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Nutrients might be good for people, animals and plants but too much of them is not good for our water bodies. These nutrients also feed aquatic plants and algae and if there is an unusually high amount of nutrients the aquatic plants can become quite a nuisance.

### Background

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The nutrients in question are mainly phosphorus and nitrogen. Nitrogen and phosphorus are found in human and animal wastes, fertilizers and organic matter (such as leaves) that can wash into streams and lakes. Phosphorus can also be found in some soaps and detergents. Although nutrients can come from point sources of pollution, they are often associated with nonpoint sources of pollution.

**Point Source:** Point sources of pollution are those that come out the end of a pipe and have an easily identified source, such as a wastewater treatment plant or a factory. Because, the source is readily identified this type of pollution can be prevented or reduced by using various technologies and treatments.

**Nonpoint Source:** As opposed to point source pollution, nonpoint pollution comes from diverse sources that are not easily identified. A lot of this type of pollution occurs when rain and snow wash pollution off land surfaces into streams. This is called stormwater pollution. It can also come from activities on or near water. Nonpoint pollution can include runoff from lawns, croplands, forested land, livestock pastures and quarters; failing septic systems; and soil erosion.

Although nutrients can cause problems in any water body, they are of more concern in lakes and reservoirs than in streams because nutrients accumulate over time in these typically more still water bodies. Most streams flush nutrients downstream quickly so there is not a large quantity present at any given time. However, if the stream flows into a lake, the nutrients it carries can become a pollution problem.

### The Big Picture

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When nutrients accumulate in lakes and reservoirs the lake's natural aging process can be accelerated and more algae and aquatic plants can grow. These consequences can lead to changes in the water's pH, and less dissolved oxygen – important elements for healthy lakes and streams.

**Eutrophication:** All lakes age over time through a natural process known as *eutrophication*. As years pass more sediment is deposited in the lake bottom causing it to become shallower. Nutrients accumulate leading to increased plant and algae growth. There is also a progressive change in the water chemistry. The speed at which this process occurs is dependent on the average depth of the lake, the climate (especially rainfall and temperature), and the size and condition of the lake's drainage basin. In general, lakes that are deep, located in cooler climates or have an undeveloped drainage basin will age much more slowly than a lake that is shallow, located in a warm climate or surrounded by development.

Although it may take hundreds or thousands of years, a shallow lake can fill in with sediment, support extensive plant growth and eventually become a marsh or even dry land.

In highly developed drainage basins, *cultural* eutrophication occurs when people increase the amount of nutrients and sediment that enter a water body and speed up its natural aging process. Some of the ways people cause this is by discharging improperly treated sewage, applying excess fertilizers, not maintaining septic systems or using detergents containing phosphates.

**Nutrients and Plants:** Phosphorus and nitrogen act as fertilizers for algae and aquatic plants. When there is an excess amount of phosphorus and nitrogen these plants grow and reproduce at an abnormally fast rate. These plants become a problem when they interfere with the desired or accustomed uses of the water body. A lake with too much algae and plants can:

- be unpleasant to view.
- have odor problems when the plants die and decompose.
- interfere with recreational activities such as boating, fishing, water skiing and swimming
- reduce the numbers of large predator fish because the plants allow small fish more protection
- deplete the amount of oxygen that fish and other aquatic organisms need. Decomposition and respiration of these plants uses up oxygen. (See the Dissolved Oxygen and the Water Quality Standards Focus sheet, publication # 02-10-001, for more information on the importance of oxygen in water).
- change the pH (acidity or alkalinity) of the water which is important to the animals that live there. Photosynthesis can increase pH while respiration and decomposition can lower pH.

## **What You Can Do**

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Anyone who lives in a watershed – and that means all of us – may take certain actions to reduce polluted runoff from their property and therefore reduce the nutrients that reach our lakes and streams. Here are some things you can do:

- Cover and store manure, yard waste, fertilizers, and other chemicals away from the water.
- Maintain or enhance vegetation alongside water bodies, to filter pollutants from the run-off. Never remove the natural riparian (stream or lake side) vegetation.
- If you have large animals, keep them away from the lake or stream. Otherwise, the animals will trample the shorelines, destroy the riparian vegetation, and directly add nutrients to the stream.
- If you must clear or grade the land or build a road, be careful to prevent erosion and keep sediments (dirt with contaminants) out of the waterways.
- If you use a septic system, inspect it regularly to make sure its functioning properly.
- Use only phosphate-free soaps, detergents and cleaners in your home or business.
- Reduce your use of fertilizers and chemicals on your lawn and garden. Rain may carry these nutrients into the nearest water body.

For more information, please contact Ann Butler at (360) 407-6480 or via email at [anbu461@ecy.wa.gov](mailto:anbu461@ecy.wa.gov) The TTD number is (360) 407-6006