

## Surface Water Pollution - Eutrophication

**Surface water pollution** is the pollution of aquatic systems that are above ground, such as streams, lakes and rivers. These waters become polluted when rainwater runoff carries pollutants into the water. ... This then leads to less oxygen production, which causes harm to oxygen-breathing organisms in the water, like fish.

The erosion of fertilizer from cropland into streams and lakes leads to **eutrophication**, the process by which the surrounding watershed enriches bodies of water with nutrients that stimulate excessive plant growth. Although eutrophication is a natural process, it can be sped up by fertilizers that contain nitrogen and phosphorus.

When eutrophication occurs, the animal and plant communities in a lake can change rapidly. Algae growing at the surface of the water can suddenly multiply very quickly. The excessive algae growth in a lake appears as a green blanket, and other organisms that eat algae can multiply in numbers as well.

In addition, the population of algae blocks sunlight from reaching the bottom of the lake, causing sunlight-dependent plants and organisms below the surface to die. The resulting overpopulation of algae eating organisms and the decay of a large number of plants and animals depletes the water's dissolved oxygen supply.

This cascade effect eventually leads to the death of all organisms within the lake that depend on dissolved oxygen to breath or sunlight to photosynthesize.

## Groundwater Pollution - Chemicals & Sewage

**Groundwater pollution** generally affects water-table, or unconfined aquifers as they do not have an impermeable layer above and below them to prevent contamination. Sources of groundwater pollution include sewage from faulty septic tanks and farms, landfills, and other waste disposal sites. Pollutants usually enter the ground above the water table, but they eventually infiltrate to the water table and then pollute the aquifer as a whole. In highly permeable aquifers, pollutants can spread quickly, and depending on elevation and substrate, can move in specific directions. Chemicals from landfills or industrial facilities can contaminate aquifers, and once they contaminants have entered the groundwater, they cannot be easily removed. Some chemical contaminants are dissolved by infiltrating groundwater, and then move as materials in solution towards the underlying aquifer.

Groundwater can also be affected by natural pollutants. One major pollutant to groundwater is **salt**, and if the salt content is too high, the water becomes undrinkable. Salt pollution is one of the major threats to aquifers along the coastlines, in which overpumping may draw salt water from the nearby ocean into the surrounding freshwater aquifer.

Another natural source of groundwater pollution is **radon gas**, which is one of the leading causes of lung cancer in the United States. Radon found in groundwater is one of the products of radioactive decay of uranium in rocks and sediment, and it usually occurs in very low concentrations in groundwater. However, some rocks, especially granite and shale, contains more uranium than others. Therefore the groundwater in areas where these rocks are present contains higher levels of radon.

Some radon can seep into houses, and because it is heavier than air, it can accumulate in poorly ventilated basements. The United States Environmental Protection Agency (EPA) advises homeowners in radon-prone regions to have their homes tested regularly for radon gas.