

Dealing With WATER Pollution

"Water; water everywhere, nor any drop to drink."

Samuel Taylor Coleridge didn't have the issue of water pollution in mind when he wrote this line more than 200 years ago. Nevertheless, his words seem to carry an eerie prophecy for the twenty-first century. With human waste, fertilizers, pesticides and other contaminants working their way into the water system, we find our drinking water getting more and more polluted all the time.

And the damage isn't limited to drinking water. Many of the contaminants and chemicals that end up in our lakes and rivers are causing extreme damage to the environment, and driving several species to the brink of extinction.



Groundwater

Thousands of urban and rural communities rely on groundwater to survive. This groundwater is found in huge underwater sources known as "aquifers." Precipitation from rain and snow passes through the soil until it is trapped in an aquifer. The soil in an aquifer is porous and permeable, so it can store a great deal of water. In fact, some aquifers are so porous that water can occupy up to 40% of their volume. There is 20 times more water stored in aquifers than in all the lakes and rivers in the world!

Aquifers range anywhere from a few feet underground to hundreds of feet below the surface. People often tap the water in aquifers by digging wells. In other places, geologic pressure forces groundwater to trickle up through the surface in the form of springs.



Use rainwater for your trees, flowers and gardens rather than using your garden hose.

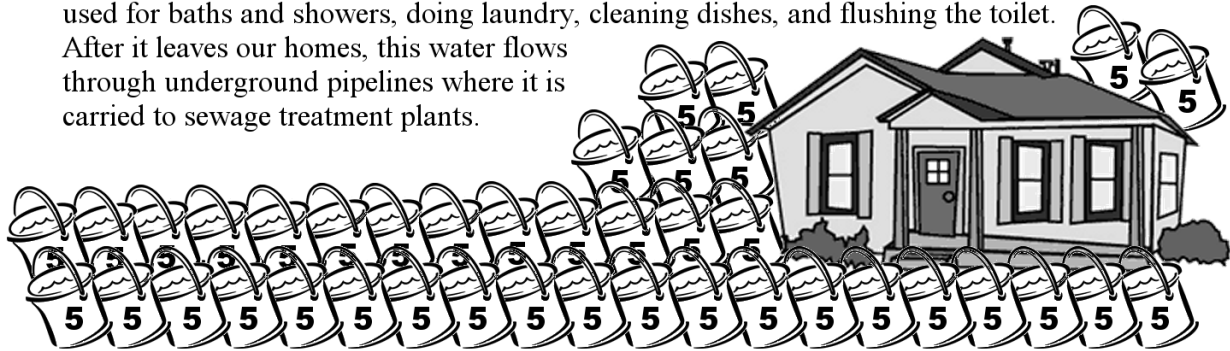
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Spring water is generally regarded as some of the finest drinking water in the world. The reason for this lies in the fact that when precipitation trickles down through the soil, impurities found in that water are often absorbed by clay. Vegetation and bacteria also neutralize certain types of contaminants before they reach the water table.

But all the contaminants that are currently being dumped in the soil really tax the ability of the earth to purify this water. For example, if a gas truck spills and dumps its load onto the ground, the gas is probably going to percolate down too quickly to be absorbed by the soil. If a large septic tank is leaking, the constant downward flow may eventually work its way into the aquifer. Pesticides, fertilizers and industrial waste are a few of the other contaminants that can trickle down into the water. The closer to the surface the water table is located, the greater the likelihood of that aquifer being contaminated.

Waste Water & Sewage

The average Canadian household generates about 200 gallons of waste water each day. It is used for baths and showers, doing laundry, cleaning dishes, and flushing the toilet. After it leaves our homes, this water flows through underground pipelines where it is carried to sewage treatment plants.



Hundreds of years ago, before cities had sewer systems and waste treatment plants, waste water simply flowed back into the lakes and rivers it came from. This waste was part of the natural cycle. Bacteria and microorganisms decomposed human waste along with dead plant and animal matter.

As long as lakes and rivers aren't overloaded with waste material, this kind of natural cleansing still goes on. With millions of people living in major cities, though, it's impossible for natural bacteria to clean up all this waste water. We rely on sewage treatment plants to clean the waste water and filter out contaminants before returning it to our lakes and rivers.

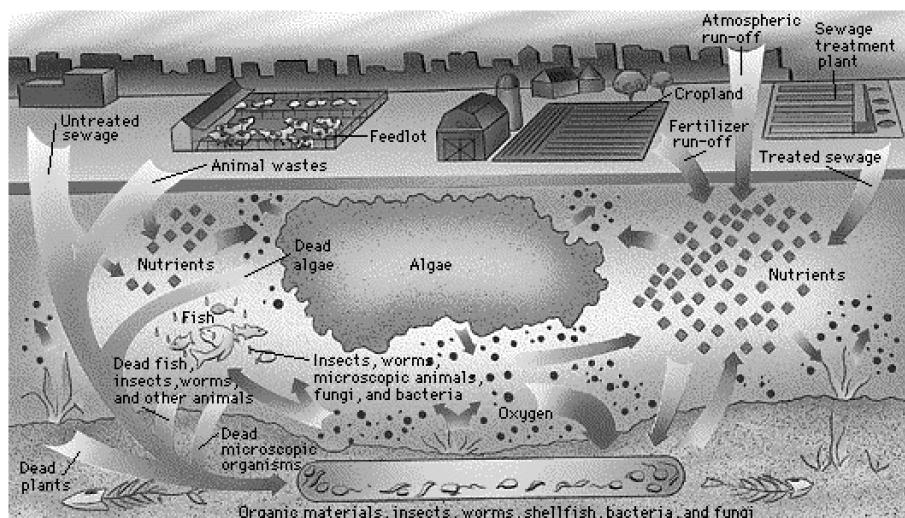
But many Canadian cities are finding it increasingly difficult to handle the huge amounts of waste water they are generating. Problems can arise when storm water flows into the sewer system. Overflow from storm sewers occasionally carries raw sewage into lakes and rivers. Bacteria that decompose human waste require a lot of oxygen to do their job. If the amount of organic matter flushed into the lakes and rivers exceeds the amount of oxygen needed to break it down, these bodies of water can become very polluted.

Another problem arises when heavy metals and industrial contaminants are flushed into these rivers. Microorganisms and bacteria simply can't break these chemicals down, and they remain a permanent threat to the environment.

Eutrophication

Eutrophication occurs when excess plant growth causes water to be depleted of oxygen. Bodies of water such as lakes and ponds all have a natural life cycle. Bacteria in the water break down organic waste and turn it into nutrients such as carbon dioxide, nitrate and phosphate. Algae feed on these nutrients. These algae, in turn, are eaten by zooplankton, and the zooplankton are eaten by fish. All of the creatures in the life cycle benefit from each other.

But this life cycle can be thrown off balance when people pollute the water with excess nutrients. For example, when nitrogen from fertilizers seeps into the lakes, algae feed on this nitrogen and grow very quickly. The algae grow much more quickly than the zooplankton can eat them. Thick layers of algae eventually cover the surface of the water, blocking off the sun. Algae and plants living underneath the water can't get the sunlight they need for photosynthesis, so they die. The dead algae and plants are then broken down by small bacteria that consume organic waste. Unfortunately, if the water contains too much organic waste, bacteria that consume this waste will use up most or all of the available oxygen in breaking it down.



Fish need oxygen to survive just like people do. But while we breathe oxygen from the air with our lungs, fish use gills to breathe the oxygen that is dissolved in water. Some species of fish - such as salmon, trout and whitefish - are unable to live in water that doesn't have a lot of oxygen. They may die off and be replaced by species like carp and catfish that don't require as much oxygen. In extreme cases of eutrophication, there may not be enough oxygen for any species of fish to survive.

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Spell out the words below by filling in the white squares.

Only 1 Letter per Square.



4-LETTERS

FISH
LAKE
RAIN
SALT
SEAS
SOIL
WELL

5-LETTERS

PONDS
SPILL
TOXIC
WASTE

6-LETTERS

OXYGEN
PLANTS
RIVERS
RUNOFF
SEWAGE

7-LETTERS

CHANGES
ORGANIC
SPRINGS

8-LETTERS

NITRATES
AQUIFERS

9-LETTERS

NUTRIENTS
PHOSPHATE

10-LETTERS

PESTICIDES

11-LETTERS

GROUNDWATER

12-LETTERS

PRECIPITATION



The Dwarf Willow of Greenland is the world's smallest tree, it grows to about two inches in height.