

Ecology

Ecology is the study of interaction of living organisms with their environment. The word *ecology* means “the study of homes“.

Water pollution

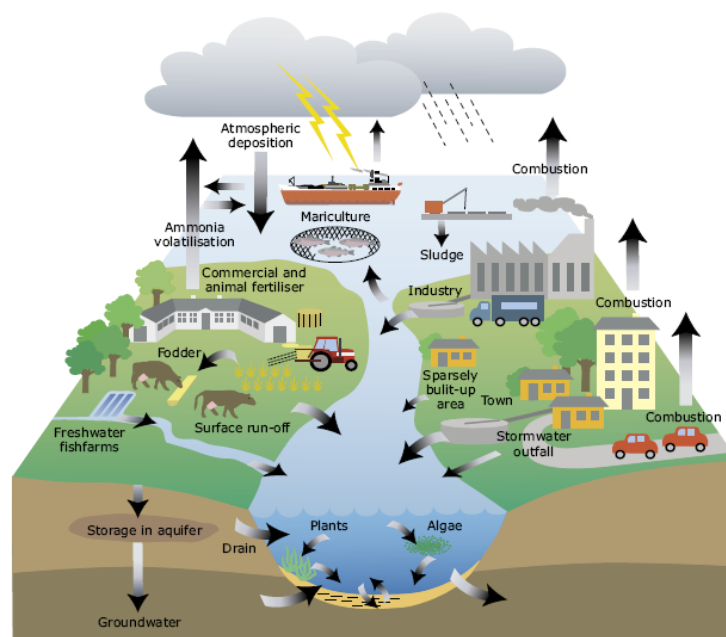
Most people in Europe have access to drinking water of good quality. However, in some parts the quality still frequently does not meet basic biological and chemical standards. Clean unpolluted water is also essential for our ecosystems. Plants and animals in lakes, rivers and seas react to changes in their environment caused by changes in chemical water quality and physical disturbance of their habitat.

Almost all human activities can and do impact adversely upon the water. Water quality is influenced by both direct point source and diffuse pollution which come from urban and rural populations, industrial emissions and farming. Diffuse pollution from farming and point source pollution from sewage treatment and industrial discharge are principal sources. For agriculture, the key pollutants include nutrients, pesticides, sediment and fecal microbes. Oxygen consuming substances and hazardous chemicals are more associated with point source discharges.

The diagram illustrates the many sources of nitrogen pollution in water. Generally, a distinction can be made between:

- point sources, such as discharges from urban wastewater, industry and fish farms;
- diffuse sources, such as background losses (e.g. forests), losses from agriculture, losses from scattered dwellings and atmospheric deposition on water bodies (e.g. marine areas or lakes).

Figure 2.1 Overview of the aquatic nitrogen cycle and sources of pollution with nitrogen



The causes of water pollution



<http://www.water-pollution.org.uk/causes.html>

Marine dumping

Dumping of litter in the sea can cause huge problems. Litter items such as 6-pack ring packaging can get caught in marine animals and may result in death. Different items take different lengths of time to degrade in water:

- Cardboard – Takes 2 weeks to degrade.
- Newspaper – Takes 6 weeks to degrade.
- Photodegradable packaging – Takes 6 weeks to degrade.
- Foam – Takes 50 years to degrade.
- Styrofoam – Takes 80 years to degrade.
- Aluminium – Takes 200 years to degrade.
- Plastic packaging – Takes 400 years to degrade.
- Glass – It takes so long to degrade that we don't know the exact time.

Industrial water and water pollution

Many industrial facilities use freshwater to carry away waste from the plant and into rivers, lakes and oceans. Pollutants from industrial sources include:

- Asbestos – This pollutant is a serious health hazard and carcinogenic. Asbestos fibres can be inhaled and cause illnesses such as asbestosis, mesothelioma, lung cancer, intestinal cancer and liver cancer.

- Lead – This is a metallic element and can cause health and environmental problems. It is a non-biodegradable substance so is hard to clean up once the environment is contaminated. Lead is harmful to the health of many animals, including humans, as it can inhibit the action of bodily enzymes.

- Mercury – This is a metallic element and can cause health and environmental problems. It is a non-biodegradable substance so is hard to clean up once the environment is contaminated. Mercury is also harmful to animal health as it can cause illness through mercury poisoning.

- Nitrates – The increased use of fertilizers means that nitrates are more often being washed from the soil and into rivers and lakes. This can cause eutrophication, which can be very problematic to marine environments.

- Phosphates - The increased use of fertilizers means that phosphates are more often being washed from the soil and into rivers and lakes. This can cause eutrophication, which can be very problematic to marine environments.

- Sulphur – This is a non-metallic substance that is harmful for marine life.

- Oils – Oil does not dissolve in water, instead it forms a thick layer on the water surface. This can stop marine plants receiving enough light for photosynthesis. It is also harmful for fish and marine birds.

- Petrochemicals – This is formed from gas or petrol and can be toxic to marine life.

Eutrophication

Eutrophication is when the environment becomes enriched with nutrients. This can be a problem in marine habitats such as lakes as it can cause algal blooms.

- Fertilizers are often used in farming, sometimes these fertilizers run-off into nearby water causing an increase in nutrient levels.
- This causes phytoplankton to grow and reproduce more rapidly, resulting in algal blooms.
- This bloom of algae disrupts normal ecosystem functioning and causes many problems.
- The algae may use up all the oxygen in the water, leaving none for other marine life. This results in the death of many aquatic organisms such as fish, which need the oxygen in the water to live.
- The bloom of algae may also block sunlight from photosynthetic marine plants under the water surface.
- Some algae even produce toxins that are harmful to higher forms of life. This can cause problems along the food chain and affect any animal that feeds on them.

What Can You Do?

If you want to help keep our waters clean, there are many things you can do to help. You can prevent water pollution of nearby rivers and lakes as well as groundwater and drinking water by following some simple guidelines in your everyday life.

- Conserve water by turning off the tap when running water is not necessary. This helps prevent water shortages and reduces the amount of contaminated water that needs treatment.
- Be careful about what you throw down your sink or toilet. Don't throw paints, oils or other forms of litter down the drain.
- Use environmentally household products, such as washing powder, household cleaning agents and toiletries.
- Take great care not to overuse pesticides and fertilizers. This will prevent runoffs of the material into nearby water sources.
- By having more plants in your garden you are preventing fertilizer, pesticides and contaminated water from running off into nearby water sources.
- Don't throw litter into rivers, lakes or oceans. Help clean up any litter you see on beaches or in rivers and lakes, make sure it is safe to collect the litter and put it in a nearby dustbin.