

# EUTROPHICATION

## What is it?

When an aquatic ecosystem (e.g., pond, lake, stream, river) becomes so rich in nutrients that the ecosystem stops working normally, we call it **eutrophication**. The main cause is an increase in nutrients that plants use to grow, especially nitrogen and phosphorus. During eutrophication, algae grows rapidly. This is called an **algal bloom**. Algal blooms causes water to become cloudy and decreases the amount of oxygen in the water. Many aquatic organisms need oxygen to survive, so a decrease in oxygen in the water causes other organisms in the ecosystem to die.

## Why does it happen?

Eutrophication can happen naturally. When it does, aquatic ecosystems can usually return to a healthy state on their own. However, eutrophication has started happening so often and to such extreme degrees that aquatic ecosystems are unable to return to their original states. Human activities are largely responsible for this process happening too often. Two of the possible human-made causes are described below:

*Intensive Farming:* The population of this country is increasing and there is need to grow more and more crops to feed people. Since there is a limit to what land we can farm on, more intensive growing is required. This means that farmers need to be able to grow more crops than before on the same amount of land. One method is to add chemical fertilizers to speed up and increase growth. This is effective but these fertilizers have a high concentration of nitrogen, phosphate, and potassium. When it rains these extra nutrients are washed through the soil and run into nearby aquatic ecosystems.

*Sewage Disposal:* Untreated human sewage is a massive form of food supply for decomposing organisms. When sewage is directly pumped into a river or lake it becomes an ideal environment for decomposers. These decomposers use up much of the available oxygen to breakdown the sewage which results in eutrophication taking place.

## How can it be prevented?

Once eutrophication has happened it is very hard to reverse, so the sooner action is taken to prevent it the better. Eutrophication can be avoided by using organic fertilizers. These fertilizers are high in nutrients but are natural to the environment. One example is manure, which decomposes slowly so the nutrients are not quickly washed away into aquatic ecosystems. Proper treatment and breakdown of sewage before it is discharged into a river could also prevent eutrophication from taking place.

Adapted from: D. Gioffre, Hillsborough Middle School, Hillsborough, NJ 08844; Funded by the National Science Foundation, Biocomplexity in the Environment Program, Award #0120453