

# What can we measure?

Sometimes too much of a good thing can be a bad thing, especially with nutrients like **phosphates** and **nitrates**. Both of these **nutrients** can come from runoff of fertilizers used on farms and lawns. Too many **nutrients** can lead to an **algal bloom** (or a large amount of algae) where the algae blooms, dies, and sinks to the bottom. Once this massive amount of organic matter begins to decay, the bacteria take all of the oxygen out of the water, which in turn kills any other organisms that need oxygen to survive.

This is known as **eutrophication** and can lead to **dead zones** in the river and in the Chesapeake Bay.

## pH

This measures the **acidity** or **alkalinity** of water. Neutral is 7. The range that the average freshwater fish can live at is between 6.5 to 7.5.

## Nitrates

Too many **nitrates** from fertilizer runoff is the main cause of eutrophication.

## Phosphates

High levels can be caused by pollution from fertilizers, but it is an important nutrient for organisms in appropriate amounts.

## Dissolved Oxygen

Fish and other aquatic organisms need oxygen to survive. Colder water tends to be able to hold more oxygen than warmer water.

## E. coli

A bacteria called *Escherichia coli* or E. Coli is a sub-group of fecal coliforms. Coliform bacteria grow in the intestinal tracts of warm-blooded animals and humans and are excreted in their feces.

## Temperature

Temperature impacts both the chemical and biological characteristics of a river. It affects the dissolved oxygen level in the water, photosynthesis of aquatic plants, metabolic rates of aquatic organisms, and the sensitivity of these organisms to pollution, parasites and disease.

## Turbidity

Turbidity is the cloudy appearance of water caused by the presence of suspended matter or solids. Higher turbidity increases water temperatures and reduces the concentration of dissolved oxygen. Suspended materials can also clog fish gills, blanket the stream bottom, and smother fish eggs and river bugs.

