

Dissolved Oxygen

What is it?

Oxygen is a natural element needed by all forms of life, including aquatic life. Most aquatic animals use oxygen dissolved in water. Oxygen primarily enters water via diffusion from surrounding air and from photosynthesis by aquatic plants.

Dissolved oxygen is measured in units of milligrams/liter (mg/L) or as a percent of saturation (%).

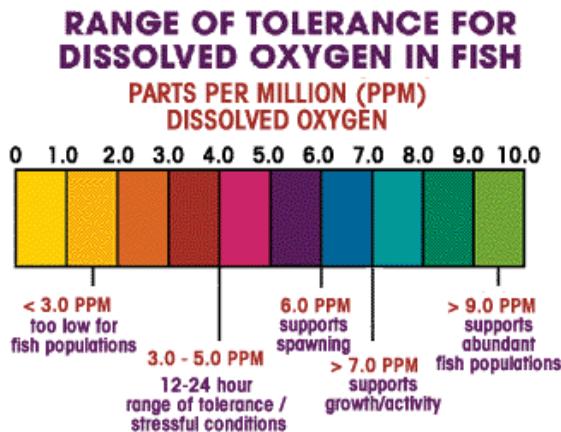
Why do we measure it?

Oxygen is necessary for all living things and for many of the chemical processes that take place in water. The amount of dissolved oxygen needed by an aquatic organism depends on a variety of factors including the species, water temperature, and the species' metabolic rate and overall health. Organisms typically have an optimum range in which they do best.

What affects it?

The temperature and salinity of water influence how much oxygen it can hold. Warm water holds less dissolved oxygen than cold water because the molecules are moving faster than in cold water and thereby allow oxygen to escape from the water. Freshwater can hold more dissolved oxygen than saltwater because saltwater has less space

for oxygen molecules due to the sodium and chloride ions it contains. Therefore the warmer and saltier the water, the less dissolved oxygen it will contain.



Source: PBS

Also, as mentioned previously, oxygen is added to water at the surface where gases in the atmosphere come into contact with it. Therefore, the movement of water from wind and waves can help oxygenate water. In addition, deeper water gets oxygen from the upper layers when mixing occurs. This mixing is aided when the density of water changes due to a change in water temperature. (See *Temperature* section for more information.)

Dissolved oxygen can also be influenced by humans. For instance, additional nutrients can enter a waterbody in runoff from lawns or farm fields, and cause a large increase in aquatic plant growth. While initially this may raise oxygen levels through photosynthesis, excess algal growth will consume oxygen on cloudy days and at night via respiration. Also, as all the plants die off, oxygen will be consumed by bacteria in the decomposition process.

