From Echo Hill Outdoor School, www.ehos.org

Dissolved Oxygen

The air we breathe holds up to 30 times as much oxygen as water does. When the oxygen level in water drops, aquatic life is in danger.

Oxygen is added to water by the photosynthesis of plants. Wind, rain, and waves also do their part by stirring in oxygen from the atmosphere. This is one reason why there is more dissolved oxygen near the surface. Quickly moving water normally has more oxygen than still water does because it has more interaction with the air.

Oxygen is used up by bacteria when they decompose waste and dead plants and animals. Since decomposition mostly takes place on the bottom where the waste is, there is less oxygen there.

The temperature of a liquid determines how easily things can dissolve into it. Solids dissolve more easily in hot liquids (try dissolving a sugar cube into cold water and another one into hot water), but gases dissolve more easily in cold liquids.

To observe this yourself, get two bottles of seltzer or other clear carbonated drink. Refrigerate one and leave the other out in a warm place. Then open the cold bottle. Some of the gas (carbon dioxide) will escape with a fizz, but most will remain in the water. Now open the warm bottle carefully. Not only will you get a lot of gas fizzing out, but you'll notice lots of bubbles rushing to the top. This is carbon dioxide that the warm water can't hold in solution.

Since oxygen is also a gas, it does not dissolve as well in warm water, so cool water is able to hold more of it. Late summer, when the water is warmest and there is little wind or wave action, is usually when the oxygen level in a pond, lake, or bay is lowest.

In an open system, fish that are sensitive to decreased oxygen levels may leave in search of higher levels. Life at the bottom that can't travel (oysters, clams, etc.) is more threatened by low oxygen levels. Trout need a lot of oxygen, so they seek cool, fast streams.

Oxygen levels should be in a range of 7–14 parts per million. (That means 7–14 parts oxygen per million parts water.) A danger reading would be below 4–5 parts per million. Dissolved oxygen can be checked with a test kit or meter.