

Root River Watershed

Dissolved Oxygen Map



- Meets Warm Water Quality Standards at least 85% of the time.
- ▲ Meets Warm Water Quality Standards between 50% and 85% of the time.
- Meets Warm Water Quality Standards less than 50% of the time.

Dissolved Oxygen

Just like humans, fish, and other aquatic organisms need oxygen to live. When fish and aquatic organisms breathe, water moves past their gills, and oxygen in the form of microscopic bubbles (dissolved oxygen or DO) is transferred from the water to their bloodstream. Without enough oxygen in the water, desirable species of fish and other aquatic life cannot survive. The amount of dissolved oxygen in water is one of the most important water quality indicators.

In recent years the Root River provided fishing opportunities for trout and salmon as they move up river in spring and fall to Racine's Horlick Dam. In order to sustain or improve the fish population, fish must have plenty of dissolved oxygen as do the other aquatic organisms that make up the stream (or river's food chain and ecosystem).



Sport fishing below the City of Racine's Horlick Dam

Many factors influence the amount of dissolved oxygen in water including: sunlight, water temperature, the presence of aquatic plants, turbulence of the water, and the

amount and type of sediments, to name a few. For example, the amount of dissolved oxygen increases wherever the water flow becomes turbulent; as water rushes over rapids or cascades over a waterfall, oxygen molecules from the air are absorbed by the water. The more turbulence, the more water is brought into contact with the air, this allows more oxygen to dissolve into the water.

The summer season presents special environmental conditions that greatly influence the amount of dissolved oxygen in the water. Warm water holds less oxygen than cold water, and as summer progresses, less oxygen is available for fish and other animals than at summer's onset. Additionally, as people begin to fertilize their lawns, "fertilized" stormwater runoff enters our waterways where it can encourage algae to grow to nuisance levels (blooms) that can further deplete dissolved oxygen. Algae are microscopic aquatic plants that add dissolved oxygen to the water during daylight hours by a process called photosynthesis. However, this process is reversed at night when this same algae consumes dissolved oxygen. Because fish, plants, and other aquatic organisms need oxygen 24-hours a day, the day-to-night fluctuations of dissolved oxygen can be significant, even at times reaching the point where there is no available oxygen! Dissolved oxygen concentrations are generally reported in units of milligrams per liter of water (mg/L). Wisconsin Warm Water Quality Standards require a minimum of 5 mg/L of dissolved oxygen in rivers and streams classified to support full fish and aquatic life.

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Dissolved Oxygen Stats

The upper Root River Watershed frequently experiences dissolved oxygen levels below Water Quality Standards. During the summer, water levels in the upper watershed become very low; water tends to pool and stagnate, resulting in low dissolved oxygen levels, and high water temperatures. Data is lacking for most of the Root River south of Milwaukee County; however the very lowest portion of the Root River, from its mouth to Racine's Horlick Dam, appears to have adequate dissolved oxygen levels.