



Water Testing Parameters

LLPOA Lake Committee - 2023

ProQuatro Water Testing Device

This one device measures multiple parameters simultaneously.

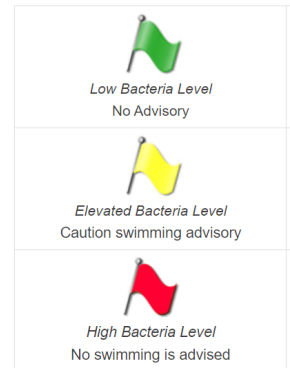
The 4 sensors measure:

- pH
- C/T
 - Specific Conductance - SPC (mS/cm)
 - Temperature
 - Total Dissolved Solids - TDS (g/L)
- Nitrate-N (mg/L) and Nitrate (mV)
- Dissolved Oxygen - DO (mg/L) or (%)



E. Coli - sent to a laboratory for testing

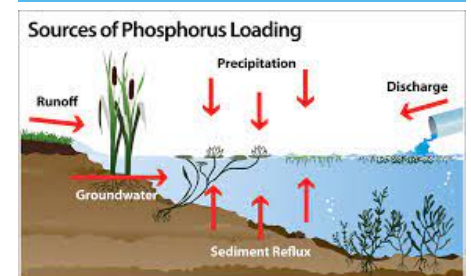
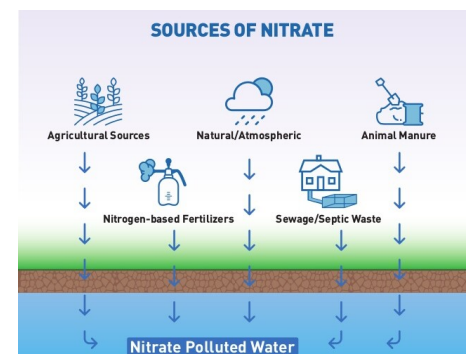
These bacteria originate from the wastes of wild animals, pets, or humans. Thus, high numbers of E. coli in a lake could come from septic systems, runoff from barnyards, or from **wildlife (especially large numbers of waterfowl)**. lakes and lakes used for swimming and other recreation should have less than 126 colonies of E. coli bacteria per 100 mL of water. High levels of E. coli bacteria can be reduced by limiting animal access to the lake, and redirecting runoff from areas where animal wastes accumulate.



Nitrate-Nitrogen & Total Phosphorus

Nitrogen and phosphorus are nutrients that may cause increased growth of aquatic plants and algae. Nitrate-nitrogen concentrations above 3 mg/L and any detectable amounts of total phosphorus (above 0.025 mg/L for our laboratory) may be indicative of pollution from fertilizers, manures or other nutrient-rich wastes.

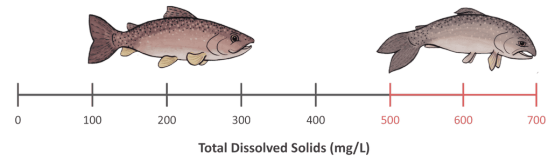
Reducing nutrient levels is critical to control nuisance growth of aquatic plants and algae. This can be accomplished by **reducing the use of fertilizers** near the water, **keeping geese and domestic animals away** from the lake, **redirecting runoff from fertilized areas**, and **maintaining a 30-foot or wider buffer strip** of higher grass around the perimeter of the lake.



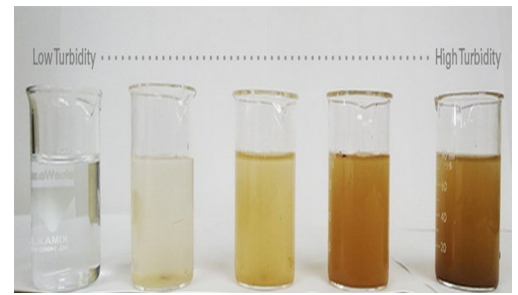
Total Dissolved Solids (TDS) & Total Suspended Solids (TSS)

Total Dissolved Solids (TDS) include dissolved minerals and salts in the water (e.g., sodium, potassium, magnesium, calcium, iron, sulfate, carbonate, silicate, and chloride). As a result, TDS is often closely related to conductivity, salinity, alkalinity, and hardness measures.

Most freshwater fish and bugs cannot tolerate high TDS because they are not adapted to saline (salty) water, like marine fish are.



Total Suspended Solids (TSS) values are often related to the turbidity (cloudiness) of water. **If TSS is high and the water is murky then light from the sun will not travel well through the water, making it difficult for plants and algae to grow.** This, in turn, can reduce productivity (the amount of plant and animal life that a river or lake can support) and oxygen generation.



pH Acidic - Neutral - Basic

The pH of a lake or lake should generally fall between 6.0 and 9.0. Different types of fish tolerate different pH levels but, in general, **most fish will do better in lakes with a pH near 7.0.** lakes with a pH less than 6.0 may result in stunted, reduced or even absent fish populations. Low-pH lakes are often treated by applying limestone (a base). This is most easily done by broadcasting pulverized limestone over the lake surface.

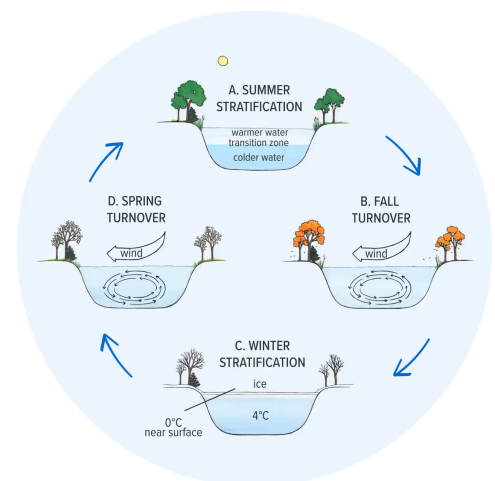
	pH 6.5	pH 6.0	pH 5.5	pH 5.0	pH 4.5	pH 4.0
TROUT	✓	✓	✓	✓		
BASS		✓	✓	✓		
PERCH			✓	✓	✓	
FROGS		✓	✓	✓	✓	✓
SALAMANDERS		✓	✓	✓		
CLAMS		✓	✓			
CRAYFISH	✓	✓	✓			
SNAILS	✓	✓				
MAYFLY	✓	✓	✓			

pH Level for Survival of Common Species of Fish

Water Temperature

Maximum summer water temperatures are critical for fish and other aquatic life in the lake. Coldwater species like trout must have summer water temperatures below 72°F while warm water fish like bass prefer summer water temperatures above 80°F. Temperature will vary throughout the lake, with surface water affected more by air temperature than deeper water. **Little can be done to alter the temperature of lake water.**

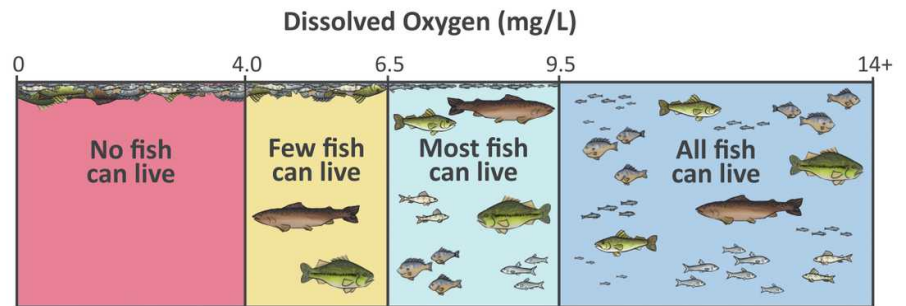
Temperature has an important influence on the amount of dissolved oxygen in water, since colder water can hold more oxygen than warm water.



Dissolved Oxygen

Dissolved oxygen, the amount of oxygen that is dissolved in the water, is critical for fish and other lake life. The maximum amount of oxygen that can be dissolved is controlled by the water temperature. **Warmer water can hold less dissolved oxygen than colder water. Dissolved oxygen is reduced by the biological decay of organic material such as decaying plants and animals or animal and human wastes.** Dissolved oxygen levels below about 6 mg/L can begin to have detrimental effects on lake life. **A**

lack of dissolved oxygen is the most common cause of fish kills in lakes. Problems can often be controlled by controlling aquatic plant and algae growth. **Aeration devices** can be used to increase dissolved oxygen in lakes that experience frequent problems.



Secchi Depth

Secchi depth refers to the depth at which a disk lowered into the water can no longer be seen from the surface. **Secchi depth is related to water clarity and is a measure of how deep light can penetrate into the water.** The availability of light underwater is important because algae and other aquatic plants need light for photosynthesis. Therefore, the productivity of a lake (how much plant and animal life it can support) is in part dependent on the clarity of the water.

This measures the cloudiness of the water due to algae growth or suspended sediment in the water. **Lakes with less than one foot of Secchi depth are candidates for lethally low levels of dissolved oxygen levels. A Secchi depth of less than three feet suggests a need to reduce nutrient levels in the lake water.**



Information from:

- <https://extension.psu.edu/interpreting-water-tests-for-lakes-and-lakes>
- <https://www.lakecountyil.gov/2385/Beach-Monitoring-and-Advisories#inland-beaches>
- <https://www.solitudelakemanagement.com/>
- <https://www.clearwatersystems.com/>
- <https://datastream.org/en/guide/>

