

# Water Quality Parameters

Parameter	Pollution Problem	Possible Causes
<b>Water Temperature Change</b>	<ul style="list-style-type: none"> <li>-Aquatic organisms have narrow optimal temperature ranges</li> <li>-Oxygen is not as soluble in warm water as it is in colder water, low DO levels can stress organisms</li> <li>-Warmer temperatures can increase toxicity of some pollutants, and can increase solubility of solid pollutants</li> </ul>	<ul style="list-style-type: none"> <li>-Shade or loss of shade</li> <li>-Release of water from standing water (temperature increases)</li> <li>-Wastewater discharges (temperature increases)</li> </ul>
<b>pH</b>	<ul style="list-style-type: none"> <li>-Aquatic organisms sensitive to low or high pH</li> <li>-Affects reproductive portion of growth cycle</li> <li>-Can affect toxicity of elements or other substances in water</li> </ul>	<ul style="list-style-type: none"> <li>-Algal blooms</li> <li>-Industrial processes release acids and bases</li> </ul>
<b>Dissolved Oxygen</b>	<ul style="list-style-type: none"> <li>-Low levels of dissolved oxygen can be harmful to aquatic organisms that require dissolved oxygen for respiration</li> <li>-Levels are affected by temperature, salinity, and atmospheric pressure</li> </ul>	<ul style="list-style-type: none"> <li>-Rapid decomposition of organics (dead algae, manure, shoreline vegetation, sewage) by microbes consumes oxygen</li> <li>-Nitrification of ammonia in fertilizers by aquatic microbes</li> <li>-Stagnation, lack of turbulence or movement in a waterway</li> <li>-Respiration of aquatic plants and algae can cause low levels of dissolved oxygen over different periods of a day</li> </ul>
<b>Turbidity</b>	<ul style="list-style-type: none"> <li>-Many fish need clear water to spot prey</li> <li>-Suspended sediments can smother fish eggs &amp; aquatic insects</li> <li>-High levels of sediment decreases light penetration, which is needed for photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>-Sediment from erosion</li> <li>-Road building, construction, agriculture, logging, anything that removes vegetation and causes sediment to be washed into a waterway</li> </ul>
<b><i>E. coli</i></b>	<ul style="list-style-type: none"> <li>-Associated with fecal matter of warm blooded animals</li> <li>-Presence of large amounts can indicate presence of pathogens such as typhoid, cholera, Hepatitis A</li> <li>-Ingestion of pathogens found with <i>E. coli</i>, and some strains of <i>E. coli</i> could lead to gastrointestinal distress and eye, nose and throat infections</li> </ul>	<ul style="list-style-type: none"> <li>-Raw sewage from Combined Sewer Overflows during heavy rains</li> <li>-Feces from animals utilizing streams for wading, drinking and cooling</li> <li>-Raw sewage from malfunctioning sanitary sewage systems</li> <li>-Illegal straight pipes</li> <li>-Illegal sewage pump-outs from boats and watercraft</li> </ul>
<b>Nitrite</b>	<ul style="list-style-type: none"> <li>-High levels in the body oxidize hemoglobin in the blood, causing oxygen to be improperly transported through the body.</li> </ul>	<ul style="list-style-type: none"> <li>-Sewage and fertilizer</li> <li>-Intermediate product in Nitrification</li> </ul>
<b>Nitrate</b>	<ul style="list-style-type: none"> <li>-Can cause excessive algal growth</li> </ul>	<ul style="list-style-type: none"> <li>-Over-fertilized fields</li> <li>-Runoff from agriculture, lawns, golf courses</li> </ul>
<b>Orthophosphate</b>	<ul style="list-style-type: none"> <li>-Can support rapid algal growth rates (algal decomposition can consume oxygen and produces odors and toxins)</li> </ul>	<ul style="list-style-type: none"> <li>-Sewage and fertilizer (agricultural runoff)</li> <li>-Enriched groundwater, suspended sediments</li> <li>-Runoff from parking lots</li> </ul>
<b>Total Phosphate</b>	<ul style="list-style-type: none"> <li>-Can support rapid algal growth rates (algal decomposition can consume oxygen and produces odors and toxins)</li> </ul>	<ul style="list-style-type: none"> <li>-Detergents and fertilizer (agricultural runoff)</li> <li>-Enriched groundwater</li> <li>-Suspended sediments</li> <li>-Runoff from parking lots</li> </ul>