



# Interpreting water quality measurements



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## Interpreting results from the HI 9829 portable logging multiparameter system

Parameter	Unit	Why measure it?
Temperature	°C	Can identify a thermocline (warmer surface waters and colder deeper waters) which can lower deep water O <sub>2</sub> levels. Higher Ts reduce gas solubilities, increase nutrient release from sediments and speed up algal growth. Toxic <i>Anabaena</i> prefers temperatures above 20°C. Shading by trees and reeds can help lower temperatures and reduce light for the growth of both good algae and toxic cyanobacteria.
Acidity	pH	Optimal algal growth occurs between pH 6.5 and 8.5. Algal blooms can raise pH levels while their decomposition lowers them. A pH between 6 and 7 makes P particularly soluble and available to algae. Low pH levels increase heavy metal solubility. Ammonium (NH <sub>4</sub> <sup>+</sup> ) is the dominant form of N at neutral conditions. Ammonia (NH <sub>3</sub> ) increases at high pH levels. It is toxic in high concentrations.
Oxidation reduction potential (ORP)	mV	High dissolved oxygen is correlated with high ORP. Ammonia is converted to nitrate which is more available to algae. The decomposition of algal blooms lowers ORP and dissolved O <sub>2</sub> .
Dissolved oxygen (DO)	%; mg/L	Rapid photosynthesis raises DO. It is highest in early afternoon and lowest at night when respiration consumes available DO. Low DO in daytime may indicate anoxia after algal decomposition.
Conductivity	mS/cm	Fresh water is < 1 mS/cm; marginal to brackish water is 1 – 5 mS/cm; seawater is 50 mS/cm. Most freshwater species prefer conductivities of <10mS/cm.
Salinity (total dissolved solids)	Conductivity x 550 = mg/L	Fresh water is < 500 mg/L, marginal to brackish water is 500 to 2,500 mg/L; seawater is 35,000 mg/L. Road runoff should be fresh; water from the Herdsman Mian Drain is about 300-650 mg/L; lake salinities increase to > 1000 mg/L because of evaporative concentration in late summer and autumn.
Turbidity	Formazin Nephelometric Unity (FNU) 1 FNU = 1 NTU	Clear water has <10 FNU with concerns for algal growth when it exceeds 25 FNU Carp increase FNU by disturbing bottom sediments while feeding. Lake water can also be naturally coloured with tannins. They are dissolved whereas

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		turbidity is caused by suspended particles. Coloured water may not be considered turbid or be detected by the instrument (to be assessed).
Ammonium-Nitrogen	mg/L	Ideally < 2mg/L; above 4 mg/L can be toxic. High ammonia may indicate that nitrification is not complete, possibly because oxygen levels are low.
Nitrate-Nitrogen	mg/L	Levels above 1 mg/L can affect sensitive species; ideally, they should be below 3 mg/L. Ammonia and nitrate nitrogen can indicate pollution (nitrogenous fertilisers) or the addition of nitrogen by non-toxic cyanobacteria (associated with water fern or <i>Azolla</i> ) or toxic cyanobacteria (e.g. <i>Anabaena</i> , <i>Microcystis</i> )
Chloride	mg/L	An indicator of salinity that can be used to estimate seepage rates. If the volumes of direct rainfall, inflows and evaporation can be estimated (along with their chloride concentrations) then the concentration of chloride in the lakes can be used to estimate seepage losses or groundwater exchanges.