Water Quality Parameters Analyzed in the McKenzie Watershed

The focus of this series is on some of the water quality parameters analyzed in the McKenzie River Watershed. Anyone interested in learning more or volunteering for water quality efforts is encouraged to contact the MWC at (541)687-9076.

pH

Aquatic organisms can be very sensitive to high or low pH's, particularly those that are less than 6 or great than 8. The reproductive portion of the growth cycle is especially sensitive. Adult organisms may continue to live, but young will not be produced.

Water (H_20) contains both hydrogen ions (H^+) and hydroxide ions (OH^-). The relative concentrations of these ions determines whether a solution is acidic or basic. In pure water at 20 degrees Celsius the concentration of hydrogen and hydroxide ions are equal. This is referred to as a neutral solution. In an acidic solution, the concentration of hydrogen ions is greater than the concentration of hydroxide ions. In a basic solution, the concentration of hydrogen ions is less than the concentration of hydroxide ions.

The activity of hydrogen ions is expressed in pH units (pH = power of Hydrogen). In most cases the concentration of hydrogen ions can be used as a very close estimate of pH. pH is a measure of the intensity of the acidic or basic character of a solution at a given temperature.

pH is an important measure of water quality because many plants and animals are sensitive to slight changes in pH. There are many natural processes that can affect pH including temperature, oxygen and carbon dioxide.

Causes of pH changes:

- Algal blooms may raise pH's. In extreme cases, the pH may be above 9.
- Many industrial processes result in release of acids or bases, thus raising or lowering the pH.
- Oxidation of sulfide-containing sediments can lower the pH through the production of sulfuric acid. This mainly occurs in coastal bays and estuaries.

Student Watershed Research Project: A Manual of Field and Lab Procedures. 3rd Edition, 1996. A Saturday Academy Publication Oregon Graduate Institute of Science and Technology.