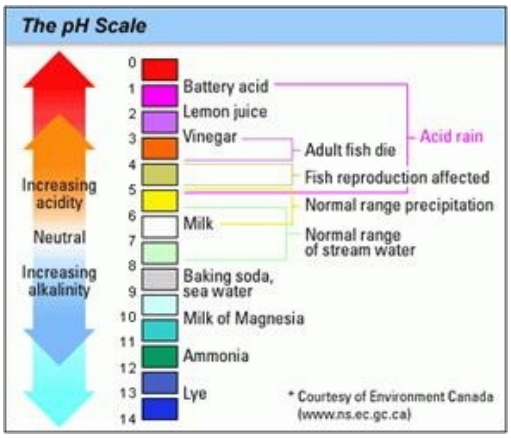
WHAT IS pH, WHY DO WE CARE AND WHAT CONTROLS pH?

What is pH?

pH is a measure of how acidic or basic soil, water or any solution is. The range goes from 0 - 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates alkalinity or a base. pH is really a measure of the relative amount of free hydrogen (H^+) and hydroxyl ions (OH^-) in the water.

This figure shows the pH range of several familiar materials ranging from 0 to 14.



Why do we care?

Pollution can change a water's pH, which in turn can harm plants and animals living in the water. Since pH can be affected by chemicals in the water, pH is an important water quality indicator. pH is reported in "logarithmic units," like the Richter scale, which measures earthquakes. Each number represents a 10-fold change in the acidity or alkalinity of the water. For example, water with a pH of 5 is ten times more acidic than water having a pH of six. Adult fish die at the pH of household vinegar and fish reproduction is impaired at a pH of approximately 4. Plant production and health are impaired at either high (>8) and low (<6) pH, because of nutrient limitations and potential toxicities.

What controls the pH in Sierra Valley streams?

Many important factors influence the pH of stream water: the source of the water (precipitation, the rocks and soils the water flows through before getting to the stream), root and microbial respiration and contaminants. The only one of these that can be controlled is input of contaminants. In Sierra Valley, we have not measured any contaminants in the streams that could change the pH. The pH is most affected by the soils through which the water flows before getting into the channels.

pH Water Quality Limit 6.5 - 8.5
(Exceedances are Highlighted Red)

DATE	4/17/2007	5/8/2007	6/5/2007	7/10/2007	8/7/2007	9/4/2007	10/2/2007
Site #	pH	pH	pH	pH	pH	pH	pH
American Valley							
1	NS	8.2	7.9	8.6	8.03*	8.4	8.4
2	8.1	8.2	7.4	7.80	7.66*	7.6	7.9
3	NS	7.6	7.3	8.1	7.52*	7.8	7.7
4	NS	8.4	7.2	7.6	7.42*	7.5	7.6
5	NS	7.46*	7.5	7.8	7.46*	7.6	7.8
Indian Valley							
6	7.8	6.9	7.4	7.4	7.26*	7.6	7.7
7	NS	7.55*	8.0	7.9	7.22*	7.8	8
8	NS	7.55*	7.9	7.8	7.42*	8.2	8
9	NS	7.57*	7.4	8.1	7.71*	8	8.1
Sierra Valley							
10	NS	7.9	7.8	8.1	8.1	7.8	8.1
11	7.80	8.0	NS	8.8	8.5	7.9	8.2
11.5	8.10	8.1	8.5	9.2	9.8	8.9	9
12	7.70	7.6	7.8	8	8.1	7.7	7.8
13	8.30	7.9	8.4	8.3	8.3	8.1	8.1
14	7.30	7.6	8.0	9.1	7.2	7.6	7.6
15	7.70	7.8	7.8	8.3	8.3	8	8.2
16	7.80	7.8	8.1	8.1	8	7.4	7.8
Goodrich Creek							
17	NS	8.1	7.86*	8.1	8.1	7.9	8.2
18	NS	7.8	NS	8	7.9	8.1	8.3
19	NS	7.7	7.92*	8	7.8	8	8.2

NS=No Sample. Irrigation season started in April for SV and May for Goodrich, AV, IV
***Lab PH reading, field meter malfunction**