



Pond and Stream Study Guide

Interpreting Physical and Chemical Factors

Water Temperature and Fish-Fish Commonly Found in Aquatic Field Studies and Temperature Preferences

COLDWATER FISH

Fish that require water temperatures **less than 70 degrees** to grow and reproduce.



Rainbow Trout



Brown Trout



Brook Trout



Blacknose Dace



Longnose Dace



Slimy Sculpin

COOLWATER FISH

Fish that require temperatures **higher than 65 degrees but less than 75 degrees** to grow and reproduce.



Fallfish



Logperch



Creek Chub



Common Shiner



White Sucker



Smallmouth Bass

WARMWATER FISH

Fish that require water temperatures **higher than 75 degrees** to grow and reproduce.



Margined Madtom



Largemouth Bass



Bluegill



Redbreast Sunfish



Rock Bass



Brown Bullhead



Channel Catfish

Species shown are not in proportion to each other, but are enlarged to facilitate identification.

Dissolved Oxygen (DO) Dissolved Oxygen Requirements by Fish Community

Cold Water Fishes: 6 mg/l and above

Warm Water Fishes: 5 mg/l

Solubility of Dissolved Oxygen

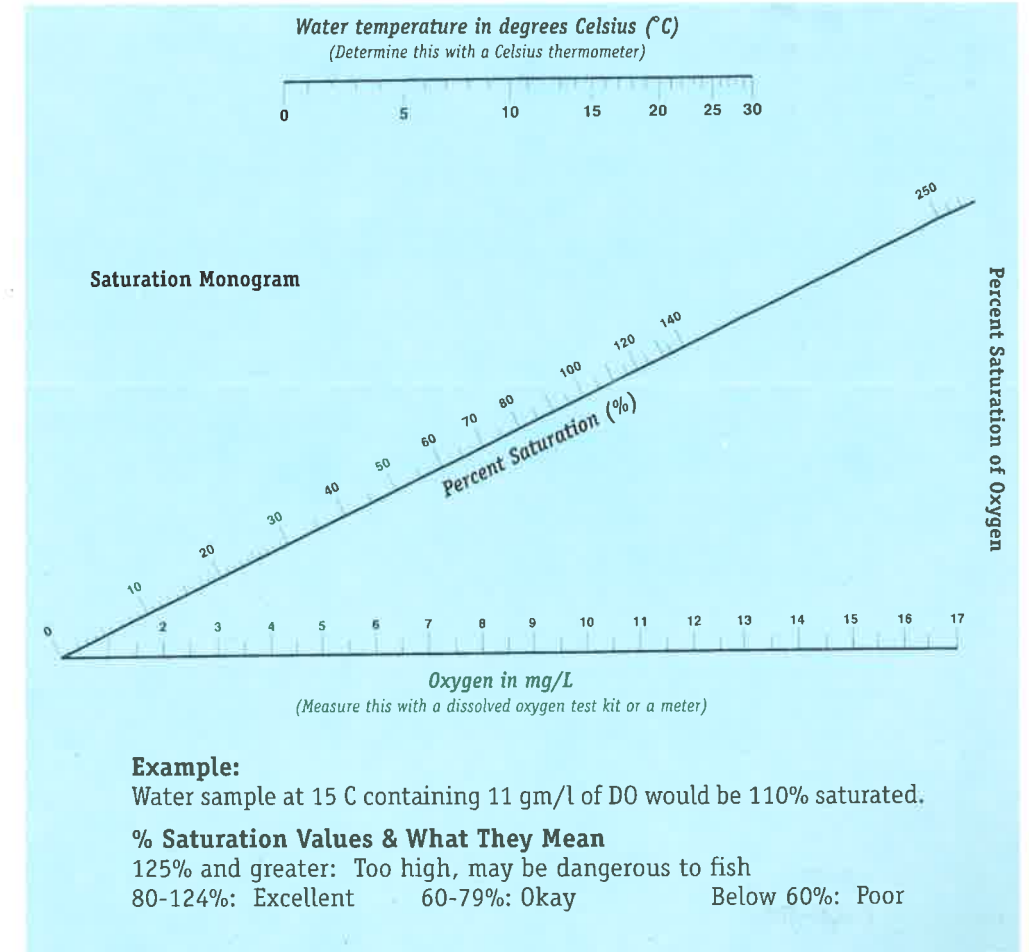
Solubility: Amount of dissolved oxygen that distilled water can hold at given temperature

Temperature (C*): Solubility (mg/l)

0:	14.6
1:	14.2
2:	13.8
3:	13.5
4:	13.1
5:	12.8
6:	12.5
7:	12.2
8:	11.9
9:	11.6
10:	11.3
11:	11.1
12:	10.9
13:	10.6
14:	10.4
15:	10.2
16:	10.0
17:	9.8
18:	9.6
19:	9.4
20:	9.2
21:	9.0
22:	8.9
23:	8.7
24:	8.6
25:	8.4
26:	8.2
27:	8.1
28:	7.9
29:	7.8
30:	7.7

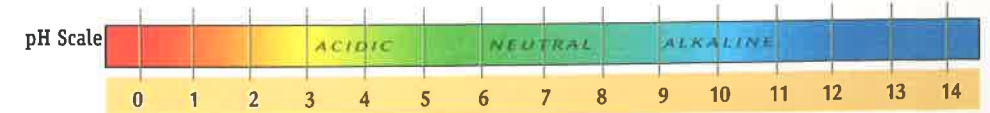
Dissolved Oxygen Percent Saturation Directions

1. Determine water temperature in degrees C, and find that value on upper (temperature) scale. *To convert F to C: [(F-32) x 5]/9= C
2. Determine dissolved oxygen and find that value on the lower (DO) scale.
3. Using a straight edge (ruler, piece of paper), draw a line from the temperature value to the dissolved oxygen value. The point at which the line crosses the middle (saturation) scale is the percent saturation of oxygen.



Adapted from: Water, Water Everywhere: Water Quality Factors Reference Unit, HACH, Inc., Loveland CO, 800-227-4224.

pH and Aquatic Organisms



Tolerant ranges for certain species

Mayfly	5.5 to 7.5	Brown trout	5.0 to 9.5	Carp	5.0 to 9.0
Caddisfly	5.5 to 7.5	Brook trout	4.5 to 7.5	Catfish	5.0 to 9.0
Stonefly	5.5 to 7.5	Yellow perch	4.5 to 7.5	Bullfrog	4.5 to 7.5
Snails, clams, mussels	6.0 to 9.0	Smallmouth bass	5.5 to 7.5	Wood frog	4.0 to 7.5
Crayfish	5.5 to 7.5	Pumpkinseed	5.0 to 7.5	American toad	4.5 to 7.5
Rainbow trout	5.5 to 9.5	Fathead minnow	6.0 to 7.5	Spotted salamander	5.0 to 7.5

Alkalinity

(Calcium carbonate:)CaCO₃

Freestone Streams

- 10 mg/l or less: Very sensitive to acid precipitation
- 10-20: Somewhat sensitive to acid precipitation
- 20mg/l or greater: Not sensitive to acid precipitation

Limestone Streams

75 mg/l or greater

Key to Macroinvertebrate Life

