Temperature

Why is temperature important?

Water Temperature is a controlling factor for aquatic life: it controls the rate of metabolic activities, reproductive activities and therefore, life cycles. If stream temperatures increase, decrease or fluctuate too widely, metabolic activities may speed up, slow down, malfunction, or stop altogether.

What influences temperature?

There are many factors that can influence the stream temperature. Water temperatures can fluctuate seasonally, daily, and even hourly, especially in smaller sized streams. Spring discharges and overhanging canopy of stream vegetation provides shade and helps buffer the effects of temperature changes. Water temperature is also influenced by the quantity and velocity of stream flow. The sun has much less effect in warming the waters of streams with greater and swifter flows than of streams with smaller, slower flows.

Fish and most aquatic organisms are cold-blooded. Consequently, their metabolism increases as the water warms and decreases as it cools. Each species of aquatic organism has its own optimum (best) water temperature. If the water temperature shifts too far from the optimum, the organism suffers. Cold-blooded animals can't survive temperatures below 0 °C (32 °F), and only rough fish like carp can tolerate temperatures much warmer than about 36 °C (97 °F).

Fish migration often is linked to water temperature. In early spring, rising water temperatures may cue fish to migrate to a new location or to begin their spawning runs. The autumn drop in temperature spurs baby marine fish and shrimp to move from their nursery grounds in the estuaries out into the ocean, or into rivers, as the case may be. As you can see, all sorts of physiological changes take place in aquatic organisms when water temperatures change.

Optimal Temperatures for Salmonids

Hatching: 9°C

Egg Development: 9-13°C

Juvenile Salmon: <17°C

Optimal Growth: 10-13°C

Growth Stops: 20°C

Spawning: <18°C

Temperature Conversion

0°C = 32°F
5°C = 41°F
10°C = 50°F
15°C=59°F
20°C=68°F
25°C=72°F

Temperature levels have many fundamental effects on water chemistry. For fish, no single environmental factor affects their development and growth more than water temperature. Many biological processes, such as spawning and egg hatching, are geared to annual temperature changes.