

## Resource Concerns

# Elevated Water Temperature

Soil

Water

Excess Water

Insufficient Water

Water Quality Degradation

Nutrients

Pesticides

Pathogens

Salts

Petroleum and Heavy Metals

Sediment

Elevated Water Temperature

Air

Plants

Animals

Energy

## Water Quality Degradation - Elevated Water Temperature

Surface water temperatures exceed State/Federal standards and/or limit use for intended purposes.

### What is it?

Temperature has an important influence on water chemistry. As water temperature rises, there is a corresponding decrease in the availability of oxygen, carbon dioxide, and other gases important to aquatic life. Elevated water temperature also results in increases of dissolved minerals that can further degrade water quality. In some areas, Federal and/or State law regulate the temperature of surface water.

### Why is it important?

Water temperature has extremely important ecological consequences. The metabolic rate of organisms rises with increasing water temperatures, resulting in increased oxygen demand. This is coupled with the reduced amount of oxygen that is available as the water temperature increases. During extended periods of warming, water may lose its potential to support healthy populations of fish and other aquatic organisms and may even kill desired species or lead to a change in species diversity. Warm water also has the potential to increase the presence of dissolved toxic substances that may restrict the suitability of water for human use.

### What can be done about it?

There is actually very little an individual landowner can do to cool surface waters. Most conservation actions designed to address water temperature issues reduce additions of heat energy. Heat can enter surface water through direct sunlight and by the air directly above the water. Reestablishing or protecting riparian vegetation is often the first step to address water temperature issues. While riparian vegetation does not cool the water, on small water bodies it can block much of the sun and keep the air in direct contact with the water surface cooler. Groundwater inflow and outflow, precipitation, runoff, and evaporation are also responsible for heat energy exchange. Water entering a water body from below ground flows tends to be much cooler than the surface water. Actions that conserve or increase shallow groundwater may increase the amount of cool water entering a water body. The sediment load of a water body also plays a role in water temperature. When the sediment load increases, water tends to spread out over a larger area. Shallow, wide channels provide more surface area for solar energy to enter the stream, potentially increasing water temperature. In addition, turbidity raises water temperature because the suspended particles absorb the sun's heat. Actions to reduce sediment reaching a water body will help reduce warming of surface water.

## Elevated Water Temperature at a Glance

Problems / Indicators - Water temperature exceeds legal standard, threatens the health of aquatic organisms, or limits the intended use by the client	
Causes	Solutions
<ul style="list-style-type: none"> <li>• Surface water unprotected from direct sunlight</li> <li>• Little or no groundwater contribution to water body</li> <li>• Sediment laden runoff reaching water body</li> </ul>	<ul style="list-style-type: none"> <li>• Reestablish riparian vegetation</li> <li>• Brush management, residue management, terraces to reduce transpiration, evaporation and/or increase infiltration of upland water</li> <li>• Buffers and filter strips to intercept sediment</li> </ul>