

## TB Field Standard Operating Procedure

Field SOP for Use of Temperature TB-CCWI-1 through 16**Meter description**

ID# TB-CCWI-1 through 16

Thermometer, bulb, alcohol filled, armored

Range 0 to 50 degree Celsius

Resolution 0.5 degree

**How to Measure Temperature**

1. Place the thermometer in the water several inches below the surface or halfway to the bottom if in a shallow stream. Allow enough time for the thermometer to reach a stable temperature (about 3 minutes).
2. If possible, try to read the temperature with the thermometer bulb beneath the water surface. If it is not possible, quickly remove the thermometer and read the temperature. Alcohol filled thermometers lose the temperature reading more rapidly than mercury filled.
3. Record the temperature on the field data sheet.

**ALTERNATIVE:** Testing temperature directly from the stream is best. However a bucket or pole method may be used as well. Be sure to place the thermometer in the sampling device immediately as sample temperature will begin to change once taken from the stream. Read the temperature as above. Note on the datasheet if temperature was taken insitu or with a sampling device.

**What to expect**

- Winter temperatures go down, summer temperatures go up.
- Storm events, shade, cool air, and groundwater seepage can decrease temperature.
- Excess turbidity, slow, shallow water, and low canopy density can increase temperature.
- High velocity, eroding soil, and heavy storms can increase turbidity.
- Temperatures increase throughout the day and decrease at night.

**Natural Levels**

- North Coast California streams range from close to 0 °C to over 30 °C
- Generally optimum temperature ranges for salmonids range from 4 to 16 °C, depending on the lifecycle and species. Spawning and embryo lifestages need cooler water than adult stages. The adult upper lethal limit is somewhere around 24 °C, with stress beginning around 17 °C.

**Laboratory SOP: Accuracy Check Thermometer**

Bulb thermometers cannot be calibrated, but we can check for their accuracy against known standards. Thermometers reading over +/-1°C will be discarded/retired from use.

Frequency: Ice bath twice a year; side by side with a NIST or other Certified Reference Thermometer when available.

1. Fill an insulated container with crushed ice. Add DI water until it nears the rim of the container.
2. Place all thermometers and meter thermastors into the ice bath. Wait at least 10 minutes for bath to reach 0 °C and thermometers to adjust.
3. Stir each thermometer and read its result. Record in calibration log.