

# TEMPERATURE



## What is temperature?

Temperature measures how much heat is present in water or air. It naturally changes throughout the day and across seasons. Water temperature affects many other water quality indicators, especially dissolved oxygen, and plays a major role in determining which plants and animals can survive in the Bay and its streams, so it's measured at nearly every monitoring site. States also use temperature, along with other indicators, to classify streams as either coldwater or warmwater habitats in order to protect the species and ecosystems adapted to those temperature conditions.

## How do we measure it?

Air and water temperature (measured in degrees Celsius) can be collected using an armored glass thermometer, a digital thermometer, or a multi-parameter probe. A single reading at the surface is often enough for streams and smaller waterways. In tidal areas, however, water temperature can vary with depth, so taking measurements at both the surface and deeper in the water gives a more complete picture of water quality.

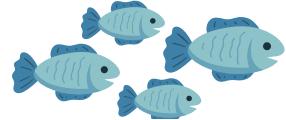
Equipment	Cost	Monitoring Time
Armored glass thermometer	\$	3 mins per site
Digital thermometer	\$	3 mins per site
Multi-parameter probe	\$\$\$	10–20 mins per site



Photo by the Alliance for the Chesapeake Bay.

## Why do we care?

### Aquatic Life



Different species have different temperature needs, and coldwater species are highly sensitive to even small increases in water temperature. Coldwater streams are essential for supporting popular recreational fishing species, like Brook Trout, which struggle to survive if stream temperatures get too warm.

### Changing Climate



Temperature is a key indicator of climate change. Tracking water temperature over time helps us understand how ecosystems are shifting. As temperatures rise, water holds less oxygen, which can make it harder for aquatic animals to survive.

### Ecosystem Health



In the Bay, layers can form when warmer, fresher water sits on top of colder, denser, saltier water. These layers prevent mixing, which can lead to low dissolved oxygen levels in deeper waters and negatively affect overall ecosystem health.

## How is my water?

If you're monitoring in the tidal tributaries or the Bay, temperature thresholds vary depending on the species and habitat; for example, high temperatures can be harmful for seagrass (ex. Eelgrass,  $> 28^{\circ}\text{C}$ ) or low temperatures can be harmful for fish (Spotted Seatrout,  $< 3^{\circ}\text{C}$ ). In non-tidal areas, the Mid-Atlantic Tributary Assessment Protocol (MTAC) provides thresholds for stream temperatures. Warmwater streams should get no hotter than  $32^{\circ}\text{C}$  ( $90^{\circ}\text{F}$ ). Coldwater streams should have temperatures below  $20^{\circ}\text{C}$  ( $68^{\circ}\text{F}$ ). State and local thresholds may vary.

### PLEASE NOTE:

This fact sheet provides general information about temperature, but water monitoring in specific locations may require more detailed methods and considerations.