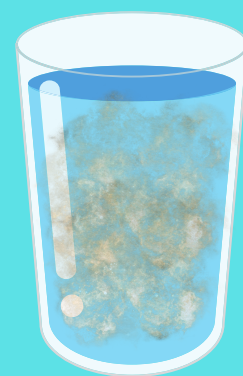


## WHAT IS TURBIDITY?

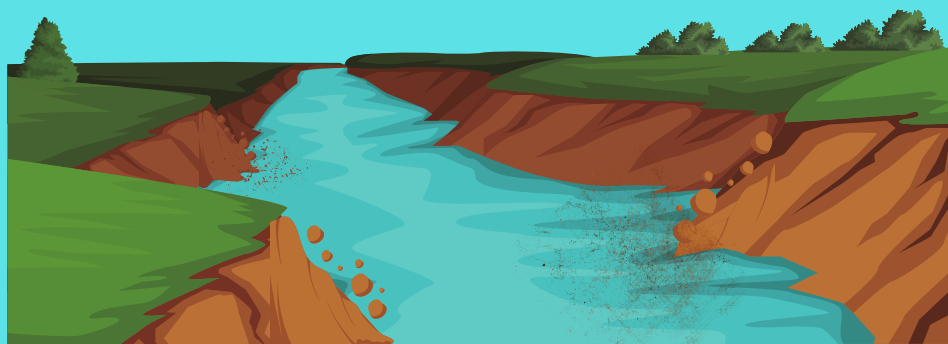
Turbidity measures how cloudy or clear a water sample is. This can tell us about fine particles of solid material suspended in the water, like silt or plankton, but there are many other factors besides suspended solids that impact turbidity. For instance, dissolved substances (which might not be captured in a total suspended solids test) can contribute to turbidity in water. Turbidity is an optical measure of the way light passes through water, as you will see in our "How do we measure turbidity" section. In contrast, total suspended solids are measured by weight (see our Total Suspended Solids Fact Sheet).

## WHY DO WE MEASURE TURBIDITY?

High turbidity can impact aquatic ecosystems in multiple ways. Many aquatic species rely on clear water for survival. Aquatic plants, for instance, use photosynthesis to survive, meaning sunlight must be able to reach them under the surface of the water. In turbid water, less light reaches these plants.



Even species that don't photosynthesize can be impacted by turbidity. Fish and other aquatic predators often hunt by sight, meaning cloudy water impedes their ability to eat. Some factors that contribute to turbidity, like suspended solids, can impact breathing by clogging gills. Turbidity can also lead to higher water temperatures due to heat absorption by suspended particles. Finally, high turbidity can indicate threats to human health, as it can be associated with a greater presence of bacteria or metals.



Turbidity in stream water typically comes from suspended soil or other particles in runoff that washes into the stream following a rain or snowmelt.

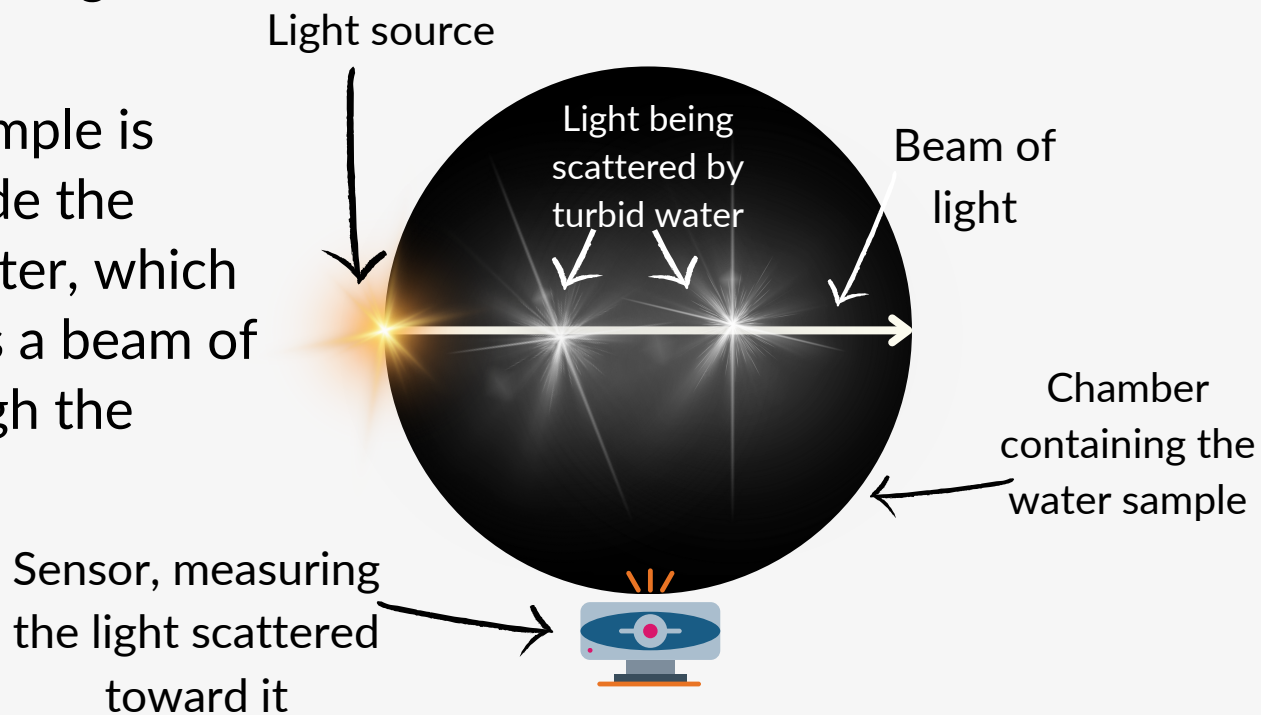
## HOW DO WE MEASURE TURBIDITY?

Turbidity can be measured using a device called a **nephelometer**. This device shines a beam of light through a sample of water and uses a sensor to determine the intensity of the light that is scattered at a 90° angle. The idea is that water with more suspended or dissolved particles will scatter more light, meaning it will be read as more turbid by the nephelometer.

Because it is defined by light scattering, this is an optical measure of water clarity and is measured in NTUs, or "Nephelometric Turbidity Units." Water that we think of as very clear is usually measured below 1 NTU.

A **nephelometer** contains a chamber for the water sample being tested, a light source, and a light sensor. In water that is *more turbid*, *more light* will be scattered by suspended or dissolved particles in the water, and the sensor will measure the scattered light.

A water sample is placed inside the nephelometer, which then shines a beam of light through the sample.



A sensor, placed at a 90° angle from the beam of light, senses scattered light sent its direction. The *more* scattered light the sensor measures, the *higher* the turbidity in NTUs.