

# Does **CLEAR** Water mean **HEALTHY** Water?

## RESEARCH ARTICLE



### Can you measure water clarity?

You can measure water clarity at your local aquatic site by measuring its turbidity. Turbidity measures the cloudiness in water. Murky water has high turbidity. Water with low turbidity is clear.

### More about turbidity

Turbidity is usually measured in Nephelometric Turbidity Units (NTU). The turbidity of surface water is usually between 1 NTU and 50 NTU. When turbidity is above 5 NTU you can see the cloudiness in the water. The standard turbidity for drinking water is between 0.5 NTU and 1.0 NTU. Many scientists say that the turbidity for drinking water must not be above 0.1 NTU. High levels of turbidity for a short period of time are less of a problem than lower levels for a long period of time.

### How does water get cloudy?

Often, the water of an aquatic site contains many particles, like soil, mud, sand, plankton, algae, and more. The more particles the less sunlight can go through the surface of the water and the cloudier it becomes.



## Vocabulary

**Dissolved Oxygen** The amount of oxygen dissolved in water. It is usually measured in milligrams per liter (mg/L).

**Ecosystem** A group of organisms together with its environment, seen as a unit.

**Habitat** The environment where a particular plant or animal is normally found.

**Photosynthesis** The process by which plants harness the energy of the sun to make food. In photosynthesis, plants absorb carbon dioxide (CO<sub>2</sub>) and give off oxygen (O<sub>2</sub>). Thus, there is an overall accumulation of carbon (C) in the plant.

**Plankton** A small freely floating group of organisms (plants and animals).

**Sediment.** Solid material that is washed into rivers, streams and lakes by winds and storms.

**Turbidity** A measure of "how cloudy the water is." It is usually measured in Nephelometric Turbidity Units (NTU).

**Watershed** An area of land that delivers runoff water, sediment, and dissolved substances to surface water bodies, such as rivers or lakes. All watersheds consist of boundaries, a basin and collection areas.



# Does **CLEAR** Water mean **HEALTHY** Water ?

## How do particles get in the water?

Soil erosion and runoff add particles in the water and increase turbidity. Various wastes such as industrial wastes, sewage, and pollutants also add particles in water. Particles in the water often include plankton and algae that can decrease water clarity. Aquatic animals also contribute to the amount of particles in the water. Animals that feed on the bottom stir up sediments making the water cloudy.

## What factors affect water clarity?

Erosion, waste, plankton and algae, and aquatic animals are some of the factors that affect the clarity of water. Heavy rainfall can speed up erosion, which results to more particles in the water. Water clarity is also affected by wind. Strong winds can stir up bottom sediments in an aquatic site. Vegetation at the bank of aquatic sites helps filter runoff and minimizes the amount of particles that enter the water. Unfortunately, far too often humans remove such vegetation causing problems to the ecosystem. Biodegradable wastes such as sewage and waste from industrial plants can also severely affect water clarity and threaten the health of plants and animals.



## How does water clarity affect aquatic habitats? How does it affect us?

Aquatic plants need light to grow. When water clarity is low, solid particles prevent sunlight from reaching plants below the surface and photosynthesis decreases. When this happens plants are in danger. Their growth is reduced and they may even die.

When clarity is low, particles absorb heat from the sun, raising the temperature of the water. In warm water dissolved oxygen levels drop (warm water holds less oxygen than cold water.) Also, with less photosynthesis plants produce less oxygen. Low oxygen levels affect animal behavior, animal and plant growth, and reproduction and may even cause death.

Particles in water clog fish gills, which can cause serious problems. Particles can also affect their growth and reproduction. Aquatic animals need light to feed. Poor water clarity blocks light and limits their movement, which makes it difficult to see their prey. Cloudy water also makes it difficult for predatory birds to see their prey.

Poor water clarity can make water unsuitable to drink and swim in. Some suspended particles support bacteria growth. The cost of filtering and disinfecting polluted water can be very high.

## RESEARCH ARTICLE

