



Fact Sheet: Turbidity in Surface Waters

Turbidity is a measure of water clarity. Turbidity describes the amount of light scattered or blocked by suspended particles in a water sample—particularly sediment. Clear water has low turbidity and cloudy or murky water has a higher turbidity level.

What causes “Turbidity”?

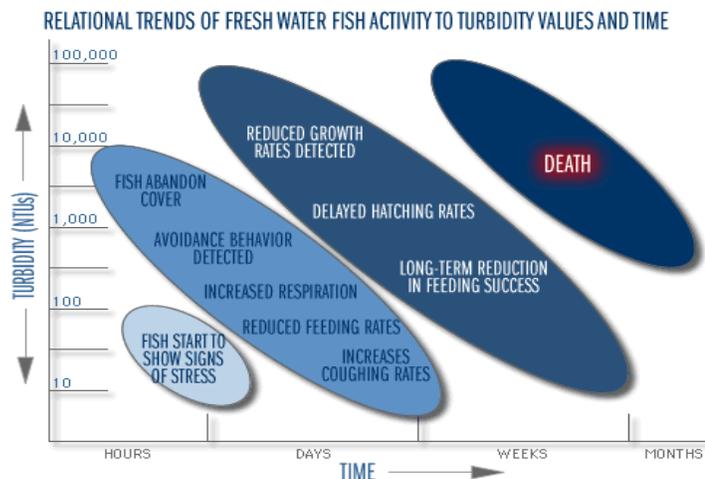
Turbidity is caused by particles of soil, organic matter, algae, metals, or similar matter suspended in the water column. These particles scatter light and make the water appear cloudy or murky.

How Do We Measure Turbidity?

An electronic hand-held meter is often used to measure turbidity. Measurements can also be conducted by use of a Secchi disc or similar instrument. Measurements may differ for the same sample depending on the instrument used and how precise that instrument is. Turbidity is commonly measured in Nephelometric Turbidity Units (NTU). The nephelometric method compares how light is scattered in a water sample against the amount of light scattered in a reference solution.

How Does Turbidity Affect Water Quality?

Turbidity affects the growth rate of algae (micro-aquatic plants) and other aquatic plants in streams and lakes because increased turbidity causes a decrease in the amount of light for photosynthesis. Turbidity can also increase water temperature because suspended particles absorb more heat. These factors lead to a decrease in dissolved oxygen.



Source: Univ. of Wisconsin Extension

Turbidity can also affect how well aquatic life can see or function underwater. Excessive turbidity is known to clog the gills of fish, interfere with their ability to find food, and bury bottom dwelling creatures and eggs

What are the Sources of Turbidity

Watersheds may have diverse sources or physical features that can increase the amount of suspended sediment in the water; thus causing the water to become more cloudy or turbid. Natural sources of sediment that contributes to turbidity include the weathering of rocks (e.g., glacial outwash), dead plant material, and phytoplankton. Human-caused sources include stormwater from urbanization, industrial discharges, and land use disturbances. Turbidity may vary on a temporal or geographic basis depending on differences in precipitation, gradient (slope), geology, flow, and disturbances such as landslides.



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Turbidity Research

Studies conducted in Alaska have documented a relationship between small increases in turbidity and gross primary productivity even at very low levels (Lloyd 1987).

A 3-13% decrease in productivity in clear streams was noted with a small increase in turbidity (0-5 NTU). Productivity decreased with greater increases in turbidity (5- 25 NTU). Higher reductions in productivity (13-50%) were observed in deep streams (greater than 1.5 feet) at higher NTU levels (Lloyd 1987).

What are the Effects of Turbidity on Humans?

Sources of turbidity can include hazardous organisms or pollutants associated with or attached to other particles. High turbidity in drinking water can shield bacteria or other organisms so that chlorine cannot disinfect the water as effectively. Some organisms found in water with high turbidity can cause symptoms such as nausea, cramps, and headaches. Besides affecting water quality, many common contaminants that increase turbidity can also change the taste and odors of the water. Water that has high turbidity may cause staining or even clog pipes over time. It may also foul laundry and interfere with the proper function of your dishwasher, hot water heater, showerheads, etc.

What Can We Do to Lower Turbidity?

The best approach to managing turbidity is to address its source. This includes reducing stormwater run-off, restoring eroding stream and lake shorelines, and applying industry-specific best management practices (BMPs). Best management practices are activities that help minimize the effects of a particular activity upon the environment. Examples include use of settling ponds, re-vegetating steep slopes, maintaining a minimum of 25 feet of vegetation around streams, lakes, and other waterbodies, and maintaining all drainage systems.

Sources: Lloyd, Denby, J. Koenings, J. LaPerrire (1987) *Effects of Turbidity in Fresh Waters of Alaska*. Journal of Fisheries Management. 7:18-13

Source: Queensland Gov't. Wetland Info

