



Physical Monitoring Instructions for Stream Monitors

The physical appearance of a stream's water and banks will give you clues to the stream's overall health. Water color, amount of algae, and stream shade may not seem critical compared with chemical measurements such as dissolved oxygen or temperature, but they are important components in the assessment of stream health and help explain the condition of the stream.

Monitoring should be conducted at the same station (location) each time. Carefully record the location of your monitoring station on your Physical Monitoring Data Form. Include roads, bridges, and significant landmarks. Use your smart phone's GPS functionality to determine your longitude and latitude.

WATER APPEARANCE

You may check more than one of the colors listed. Make note if strange colors are present throughout the stream or only in one section, such as immediately below a discharge pipe or highway culvert.

- **Clear:** Clear water doesn't necessarily mean clean water, but it could indicate low levels of dissolved or suspended substances.
- **Brownish:** Brown water is usually due to heavy sediment loads.
- **Blackish:** Blackish water is usually caused by a natural process of leaf decomposition.
- **Foamy:** Foam can indicate detergent in the water or can be the result of natural causes such as water bubbling over rocks and picking up oxygen.
- **Oily:** Oily sheens can be caused by petroleum or chemical pollution. Or they can occur naturally as byproducts of decomposition. To tell the difference between petroleum spills and natural oil sheens, poke the sheen with a stick. If the sheen swirls back together immediately, it's petroleum. If the sheen breaks apart and does not flow back together, it is from bacteria, plant, or animal decomposition.
- **Milky:** A milky appearance may be caused by salts in the water.
- **Muddy:** Muddy water is due to excess sediment in the water.
- **Scummy:** A scummy appearance can indicate a variety of natural causes or pollution sources.

STREAM BOTTOM APPEARANCE

Similar to water color, colors on the stream bottom may have natural or human-induced causes. Record the overall appearance of the stream bottom.

ODOR

Note any unusual odors. Odors may come from natural processes or may indicate potential water quality problems.

- **None:** The water has no odor.
- **Musky:** Musky odors may result from natural or human-induced activities.
- **Rotten eggs:** This odor can be caused by hydrogen sulfide gas, a by-product of anaerobic decomposition (rotting without oxygen). This is a natural process that occurs in areas that have large quantities of organic matter and low dissolved oxygen. It may be caused by excessive organic pollution.
- **Oil:** Petroleum or chemical smells can indicate serious pollution problems from a direct source, such as industrial runoff.
- **Sewage:** Sewage or manure smells can be common in the air (especially near farmland) but should NOT be what our water smells like. It is important to differentiate whether the odor is coming from the water or the air.

ALGAE COLOR AND TEXTURE

Visible algal blooms can be caused by different species, both harmful and non-harmful. Color alone is not an accurate way to tell if the bloom is toxic or dangerous, but it can help identify the type of algae present.

ALGAE AMOUNT

A great deal of algae may indicate too many nutrients in the water. Large amounts of algae in the water for an extended period of time can block sunlight needed by underwater plants and use up dissolved oxygen in the water. Sometimes more algae will appear in the spring after snowmelt releases extra nutrients into the stream. However, take note of the percent and type of algae present in the stream to make sure it is not increasing over time.

STREAM BED STABILITY

An unstable stream bed can mean that soil is eroding from the bottom of the stream and may indicate water quality problems. When standing in the stream, determine how frequently the bed sinks beneath your feet.

RIPARIAN ZONE WIDTH

Tree roots hold the bank together during floods and provide habitat for stream life. Shrubs, grasses, and other plants slow and filter runoff water before it enters the stream. Although a riparian zone of as little as 10 feet may help keep banks from eroding, 30-50 feet is needed for nutrient removal and more than 100 feet is needed for wildlife habitat.

STREAM CHANNEL SHADE

Looking upstream, estimate what percent of stream is shaded by trees and overhanging vegetation for as far upstream as you can see. More canopy cover means the water will be cooler, which means more dissolved oxygen for stream life.

STREAM BANK COMPOSITION

The shape and condition of stream banks give important information about the health of the stream and what kind of life it can support. Steep, cut, and eroding banks are not as healthy as gently sloped banks with trees and grasses growing on them. Look at both sides of the stream's banks when calculating the composition.

STREAM BANK EROSION

Too much sediment in the stream due to erosion can clog fish gills, smother bugs, and damage habitat. Look at both sides of the stream bank to determine the percentage of soil erosion.