

Getting to Know: Water Quality

What comes to mind when someone says the term “water quality”? Maybe you think of a crisp, refreshing glass of water. Perhaps you imagine swimming in a crystalline lake or maybe you envision water with poor quality, full of algae and pollution. In our modern lives, we hope that our water will be clean and of high quality, but unfortunately, that is not always the case. There are many different things that can impact water quality. Runoff from cars and roads can carry pollution into bodies of water. Development can cause stream banks to erode and add large sediment loads to rivers and streams. In this lesson, you will learn how we are able to measure water quality by studying different physical, chemical, and biological parameters that affect water quality.



Water pollution is not always this obvious. That is why we measure a variety of parameters.

Sounds interesting! Let us start at the beginning.

What are parameters? What are some physical parameters?

Good question! A parameter is defined as a “measurable factor.” In other words, a parameter is more than just a simple observation or opinion; it is rooted in science. By taking detailed measurements of bodies of water, we can learn more about their health. Simply observing bodies of water can also be important; our senses can give us a good starting point for learning about water quality. You can ask yourself questions like *Does the water look clean? Is there visible pollution anywhere? Do I notice any bad odors near the water?* These observations can be helpful, but studying parameters gives us solid data, which can be more useful in determining the quality of the water.

There are several different physical parameters that you will study in this lesson. The first is temperature. In general, the cooler the temperature of water is, the higher its quality will be. It is impossible to say that all high-quality water should be a specific temperature. There are too



Misconception 1: *I know that many plants and animals live in wetlands. Is that all wetlands are good for?*

Although it is true that wetlands are important homes for many different plants and animals, they serve other purposes as well. Wetlands also act as a natural water filter. The many different wetland plants can help filter pollutants out of water, making water that leaves a wetland clearer than the water that entered the wetland. They are also beautiful places for humans to visit and learn about ecosystems.

many different ecosystems for this to be true; water in Florida will likely be much warmer than water in Alaska.

However, temperature is a useful parameter for studying specific bodies of water. Temperature fluctuations or swings may indicate that something is affecting water quality. Many of the organisms that live in and depend on the water may not be able to survive large temperature fluctuations.

Another important physical parameter is turbidity, which is a measure of the suspended solids present in the water. Sometimes we can see the turbidity of water: if a stream bank has collapsed and a lot of mud enters the water, the water may look cloudy. If water is too turbid, the temperature can increase, among other detrimental consequences.

Wow, this IS interesting! Will we learn how to conduct water tests in this lesson?

You will learn how to conduct various water quality tests in this lesson, so you will get some valuable hands-on experience. Before you get there, however, let us look at some other facets of water quality. In addition to the physical parameters, there are also many different tests for chemical parameters.

Some of the different chemical parameters include dissolved oxygen, pH level, salinity, and nitrates. Dissolved oxygen is a measure of how much oxygen the water holds; the more oxygen, the better. Water's pH level tells us if the water is acidic, neutral, or basic. Salinity tells us how much dissolved salts are in the water, and nitrates are chemicals that can adversely affect the quality of water. You will learn more about each of these tests during the lesson.

Are there any other parameters that can tell us about water quality?

Yes, there is one other parameter you will learn about. It is called a biological parameter, or sometimes a bioindicator. These are living things, like aquatic insects or macroinvertebrates, which can tell us about the water quality of an area. The presence of some bioindicators helps us know if the water has high quality; other bioindicators (like those that thrive in low levels of oxygen) tell us if the water has low quality.



Bioindicators, like this mayfly, can tell us about water quality.



Misconception 2: *I think bugs are creepy. Bugs cannot be good for an ecosystem, right?*

Wrong! Bugs, or aquatic insects and macroinvertebrates, are important for a healthy ecosystem. Many of these insects have especially adapted to live in very specific environments; their presence or absence in an aquatic ecosystem can help us know if that ecosystem is healthy or not.