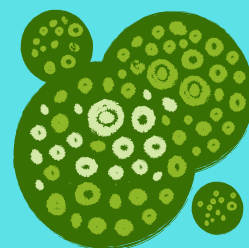


WHAT IS PHOSPHORUS?

Phosphorus is chemical element number 15 on the periodic table of the elements. It is a naturally-occurring, essential nutrient for life. In fact, phosphorus is part of critical molecules like ATP, which stores energy in our cells, and DNA. Phosphorus is an important component of an aquatic ecosystem when present at appropriate levels.

WHY DO WE MEASURE PHOSPHORUS?

Like most components of an ecosystem, phosphorus in excess amounts can disrupt the ecological balance. Phosphorus can contribute to the growth of algae and other aquatic plants.



While many nutrients are involved in aquatic plant and algae growth, phosphorus is often referred to as a "limiting nutrient," as it tends to be present at a more limited concentration than other nutrients. This means that the presence of phosphorus can have an outsized impact on aquatic growth. Excessive growth of plants, algae, and cyanobacteria can trigger cascading ecological effects including decreased dissolved oxygen levels and harmful algal bloom formation.

There are many possible sources of excess phosphorus in waterways. This nutrient tends to attach to soil particles that are picked up and transported by water. It is often associated with agriculture, and this is one possible source as phosphorus is commonly present in fertilizers and manure. Phosphorus can also reach our waterways through industrial runoff, sewage outfall, poor septic systems, and wildlife. Complex physical and chemical dynamics within lake systems can also lead to fluxes of phosphorus.

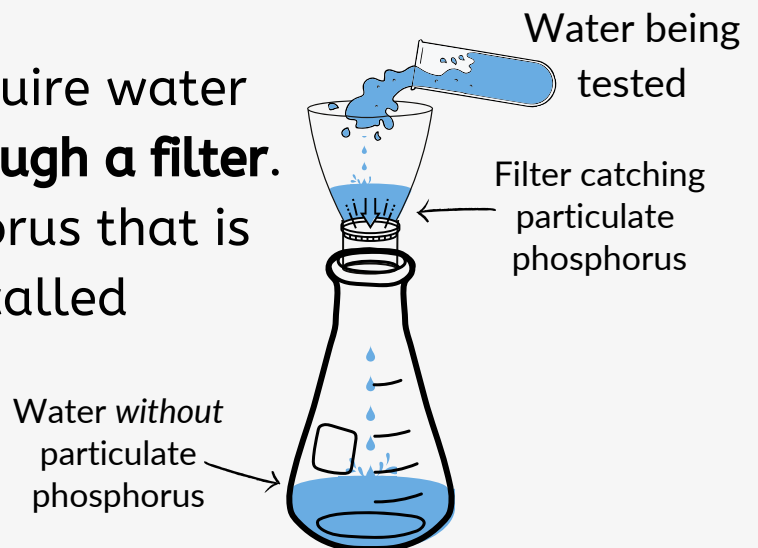


HOW DO WE MEASURE PHOSPHORUS?

There are multiple lab processes related to phosphorus. Each measures some fraction of the phosphorus present in the environment. These different fractions of phosphorus interact with the environment in different ways. Phosphorus naturally moves through the environment via "the phosphorus cycle." It can be more or less bioavailable (available for uptake by plants and algae) depending in part on whether or not it is bound to sediment.

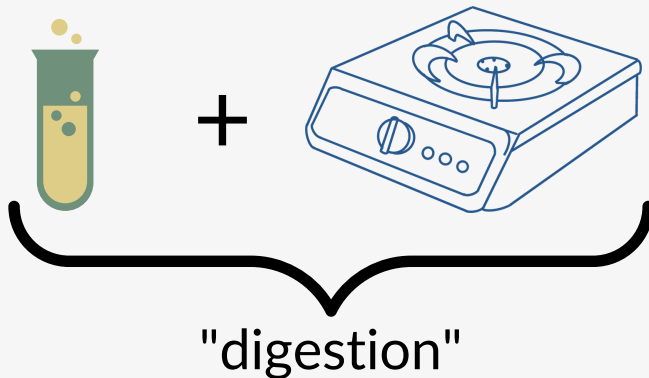
Different processes of our phosphorus lab analysis tell us how phosphorus shows up in our waterways. Phosphorus can be measured using a filter, a lab process called "digestion," or both.

Some phosphorus analyses require water samples to first be **passed through a filter**. This separates out the phosphorus that is attached to eroded sediment, called "particulate phosphorus."



Sulfuric acid

Heat



Phosphorus analyses can include a process called "digestion," too. Like digestion in our bodies, this process uses acid and heat. In this case, it converts all forms of phosphorus to the form "orthophosphate," which is easiest to measure.

For more in-depth descriptions of the various lab analyses for phosphorus, see our fact sheets on total phosphorus, total dissolved phosphorus, and soluble reactive phosphorus.