

Phosphorus: Just A Little is Too Much for Our Lakes

What is Phosphorus?

Phosphorus is a non-metallic chemical element that is commonly found in nature. It is an important mineral required by most living organisms. Phosphorus can be found in various forms, most commonly phosphate (PO_4^{3-}). However, when measuring the amount of phosphorus in aquatic systems, the total phosphorus is measured consisting of both the particulate and dissolved forms.

What are Phosphorus Sources?

There are many sources of phosphorus in aquatic systems. These sources can be natural such as waterfowl waste, atmospheric deposition, weathering of geologic phosphate material, and plant decomposition; or they can be human induced such as fertilizer, agricultural and urban runoff, industrial and domestic sewage as well as faulty or overloaded septic systems.

Why is Phosphorus Important in Our Lakes?

Phosphorus in our lakes is considered the “limiting nutrient.” Phosphorus typically limits aquatic plant (macrophytes and algae) growth because it is less available for uptake than other nutrients (nitrogen) in aquatic systems. Different forms of phosphorus are available at different rates for aquatic plants. Orthophosphate is immediately available for uptake by algae while particulate phosphorus can become available over time through decomposition.

Even a small increase in phosphorus concentration can increase levels of algae and/or cyanobacteria, and corresponding chlorophyll-a concentrations. Excessive phosphorus concentration, along with an adequate supply of sunlight, can increase littoral macrophyte abundance and promote algal and/or cyanobacteria blooms, temporarily decreasing water transparency. As these cells die, they slowly settle into the deeper, darker waters of the lake bottom. Bacterial decomposition of abundant cell quantities depletes oxygen levels in the bottom waters. Anoxic (devoid of oxygen) water and sediments promote conditions that encourage the recycling of phosphorus back into the water column.

How can Phosphorus Sources be Managed?

The importance of managing phosphorus in the watershed is essential to protecting and maintaining a healthy lake. Identifying phosphorus sources in a lake's watershed is the first step in developing a watershed management plan. Watershed activities that promote phosphorus loading typically include: lawn fertilization, irresponsible tree cutting; removing tree stumps, bushes and grasses; and increasing impervious surface areas, such as driveways, rooftops, parking lots etc. These activities can increase water runoff to the lake.

Watershed management plans should utilize best management practices and low impact development techniques to minimize the movement of phosphorus from the watershed to the lake. If a management plan doesn't exist or you don't have time to develop one, here are a few things you can do to minimize your impact on phosphorus loading.

- Plant native shrubs or other vegetation to reduce shoreline erosion and provide a vegetated buffer that helps to absorb nutrients before entering the lake.
- Maintain a properly working septic system and have it pumped regularly to decrease the amount of phosphorus leaching into groundwater.
- Use phosphate free fertilizers as required by law.
- Use phosphate free soaps and/or detergents in your home.
- Do not dump leaves or grass clippings in the lake or burn brush on the lake or near the shore.
- Clean up after your pets.
- Do not feed waterfowl.