

Aerators, Fountains & Lake Oxygen

Lake ecology is complex topic. This article is just a brief description of the primary benefits of aeration.

Lake Oxygen

Aerators add a significant amount of oxygen to the water by “turning” the water over. It is not the little bubbles that add oxygenation. It is the transfer of oxygen from the atmosphere to the water. This obviously happens at the lake surface.

Water oxygen usually called dissolved oxygen (DO) is measured in parts per million (PPM) and ranges from 0 – 12 PPM. Atmospheric oxygen (the oxygen we breathe) is about 21% or 210,000 PPM. This significant difference causes oxygen to transfer from the atmosphere to water (along the surface).

An aerator creates a current that brings the oxygen poor water from the bottom of the pond to the top. This allows oxygen to transfer even easier.

Thermal stratification

Water easily *stratifies* that is, the hot water (warmed by the sun) stays at the top and the cooler water stays at the bottom. Consequently, water at the bottom of a lake or pond has no way to replenish its oxygen. Aerators help maintain healthy oxygen level throughout the pond (5 – 10 PPM is good).

Bottom animals

When thermal stratification causes anoxic (no oxygen) conditions at the bottom of a pond, all the animals that require oxygen and cannot swim to the surface die.

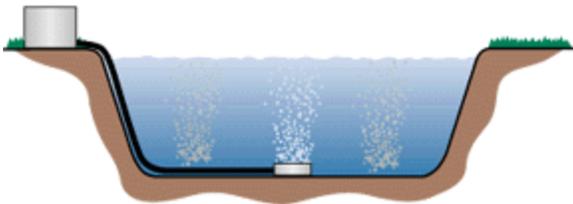
The main animals are the decomposers (mollusks, worms, microscopic animals and bacteria). Bottom sediment builds up much more quickly without this group to break down the plant material that falls in the pond. Aerators help keep a diverse community of decomposers on the bottom & the lake stays healthy.

Algae

Aerators reduce algae by helping aerobic (needs oxygen) bacteria out-compete algae for the nutrients in the lake water. In addition, the water movement sweeps millions of developing algae cells to the darker bottom water, thus preventing them from reproducing quickly in the warm, sunny water along the surface.

Aerators vs. fountains

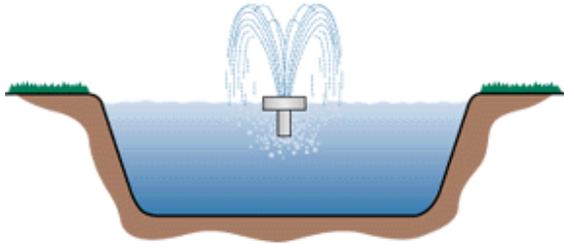
Fountains are architectural design features. Aerators are biological tools.



Aerators pump air down the bottom of a pond & the air bubbles up through the water. Most people don't even notice the bubbles at the pond surface over the aerator head.

This creates a circulation pattern that pulls the low oxygen water from the bottom to the surface. The water flows up and then out along the surface then back down to the bottom. As the water flows at the surface it picks up oxygen.

An aerator's effective zone is between 20 and 200 feet in diameter depending on the water depth. This zone crosses the entire water column from top to bottom. Aerators are helpful in lakes less than 10 acres. Aerator compressors are located in a box near the shore. This box is usually smaller than 2' square. The sound is minimal; you can hear it when standing about 15' from the box.



Fountains pump a stream of water into the air

Fountains cost more to operate because they are pumping heavy water into the air.

Unlike aerators, fountains can house lights that contribute to the enjoyment of the lake at night.

Both fountains and aerators help push floating algae and other plants to the shore. Aerators are much more effective at this task.

Aerators usually run 24 hours every day. Fountains are usually used anytime people can see and enjoy the water display.

Cost

In general, quality fountains cost more than quality aerators, because it takes more heavy-duty equipment to move water than it does to move air. Low cost aerators and fountains are advertised frequently on Internet. These low-priced fountains are designed for intermittent operation on very small ponds.

Aerator fountains

Most fountains add a small amount of oxygen where the water falls back into the pond. This effect is localized probably no more than five feet from the falling water area. Aerators add hundreds of times more oxygen to a much larger area in the lake.

The exception to this generalization is a type of fountain that uses a propeller to throw the water up into the air. This type of fountain is good for shallow ponds because it moves a high volume of water around.

They do not shoot the water very far into the air, but the water movement helps the pond just like aerators do.