

As weather changes, so do temperatures in your lake or pond.

During the summer, lakes and deeper ponds will stratify into different layers due to differences in water temperature. The sunlight heated water near the surface is less dense than the cooler water beneath it. This difference in density does not allow these two layers to mix. This results in temperature gradients moving from the lake surface to the substrate. The point where you have the greatest temperature difference is called the “thermocline” and it marks the transition from warm, oxygen rich water to cooler, anaerobic water (lacking oxygen).



Fish kill due to oxygen depletion from turnover

In a stratified pond, the water close to the pond bottom and the associated sediment layer is devoid of oxygen and can only support anaerobic bacteria. These bacteria are inefficient at breaking down the organic material that settles to the pond bottom (leaves, grass, algae, aquatic vegetation, etc.). As a result, a thick layer of decaying “muck” accumulates here over time. High levels of methane and sulfur gases concentrate in this layer. Due to poor water quality, fish are not able to utilize that portion of the pond below the thermocline.

Smaller ponds can turnover from smaller events, but with big effects.

In small urban ponds, turnovers are not restricted to the fall season. A brief, heavy thunderstorm during the summer is often the only catalyst needed to turn over retention ponds in this area. These types of turnovers are usually the most damaging to the health of a pond. In some cases, a pond turnover can happen so quickly that it will kill fish due to a severe drop in dissolved oxygen levels. The biological oxygen demand (BOD) of the pond is the determining factor in the consequences of a rapid turnover. Ponds with large fish populations, deep organic sediment layers, high nutrients, and poor aeration are most prone to catastrophic fish kills.