The Flow

SPRINGFIELD WATER & SEWER COMMISSION

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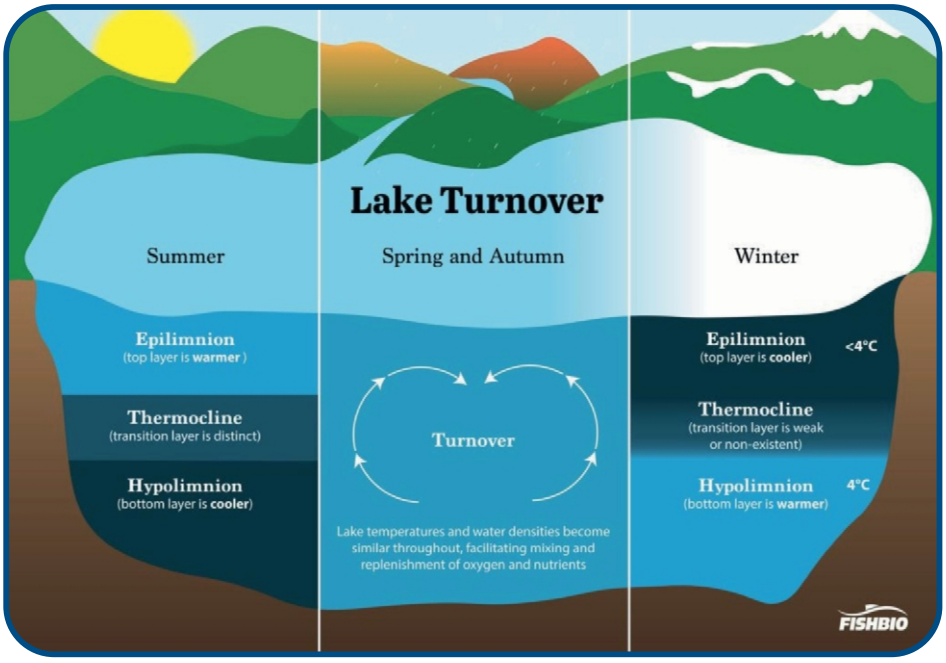
More Information

603 West Main Street
Springfield, KY 40069
(859) 336-5454
service@springfieldwater.org
www.springfieldwater.org

Lake Turnover – Weather & Raw Water Quality

Weather greatly influences raw water quality. When it rains, surface runoff clouds the raw water and turbidity increases, while alkalinity and pH generally decrease. In the summer, algae greatly impacts water quality and adjustments are made at the WTP in treatment strategies. Seasonal change is somewhat predictable – like lake turnover in spring and fall.



Did You Know?

November 19th is World Toilet Day. Approximately 2.3 billion people worldwide do not have access to safe and clean toilets, with around 892 million having no toilets at all. This lack of sanitation poses serious health risks and contributes to the spread of diseases.

EFFICIENT & HIGH QUALITY WATER SUPPLY

Lake turnover happens as significant seasonal temperature changes occur both in spring and in fall. During the winter and early spring, the top layer (epilimnion) of the lake is the coldest as it is in contact with the cold winter air. Just as ice floats to the top of a glass of water, the coldest (often icy) water is found at the top of the lake and warmer water settles to the bottom. However, as temperatures start to climb in spring/summer, the top part of the lake is penetrated by the hot sun, significantly increasing water temperatures and allowing for photosynthesis. The lake is more significantly stratified during warm months and the temperature change throughout the water column is dramatic. The middle layer of the lake (thermocline or metalimnion) is where the sun cannot penetrate and is considered the transition layer. The bottom layer (hypolimnion) is where the cool water settles.

As these seasonal transitions occur, the lake is said to 'turnover' as water from the bottom layer rises to the top and vice versa. During lake turnover, water quality throughout the water column is relatively consistent. The minerals and sediments from the bottom of the lake are dispersed throughout the water column. The changes in water quality can happen slowly over the course of a few days or sudden and dramatically (basically all at once) if lake turnover coincides with a heavy rain event. The duration of these changes is less predictable and can last anywhere from a week to a few months based on environmental factors such as lake level. Anticipated water quality changes include higher concentrations of iron, manganese, nitrogen and total organic carbon (TOC) as well as lower dissolved oxygen. These changes require additional chemical treatment and adjustments to standard operating procedures to maintain high quality tap water.

We are actively working with KY Division of Water (KDOW) to obtain federal grant money to install raw water quality monitors at our raw water pump station near Willisburg Lake. These monitors which we anticipate installing in 2026 will continuously measure manganese, nitrogen, algae, pH, and dissolved oxygen, providing water treatment plant operators ample time (hours instead of minutes) to make operational decisions to best preserve high quality tap water.