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Dynamics of a Eutrophic Lake (Wilgreen Lake, Madison County, Kentucky): A First Step in Cleansing a Lake System Impaired by Nutrient Loading

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Dynamics of a eutrophic lake (Wilgreen Lake, Madison County, Kentucky):
A first step in cleansing a lake system impaired by nutrient loading

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Wilgreen Lake (Madison County, Kentucky) is a eutrophic lake formed by damming Taylor Fork, part of the Silver Creek watershed. The lake is listed "nutrient impaired" by the Commonwealth and the EPA, and it is likely that nutrient input from human activities is affecting water quality. Our study aims first to characterize the physical characteristics and water quality of the lake (2006), and then to determine the specific proportion of nutrient inputs (2007) to the lake with the ultimate aim of improving its water quality.

Research started in May 2006 with work occurring throughout the 2006 field season with the intent of establishing a baseline for key lake parameters. We used a YSI probe to measure temperature, conductivity, oxygen concentration, and pH, and assayed for total ammonia nitrogen using the sodium hypochlorite, colorimetric method. The lake was already strongly stratified in May with disoxic and anoxic water below about 4 meters. Stratification strengthened in the summer with the disoxic-oxic boundary moving upward to about 3 meters, showing a sharper gradient oxygen gradient. Ammonium concentrations are typically zero in the oxic zone, and increase in concentration with increasing water depth in anoxic waters to about 5 ppm.

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