

Weaver Lake

The Weaver Lake water quality in 2005 achieved the in-lake goals to support full contact recreational use. In 2005, the Weaver Lake average phosphorus concentration was 23 $\mu\text{g}/\text{L}$ with values ranging between 17 and 38 $\mu\text{g}/\text{L}$ from May through September. The concentrations were significantly below the water quality goal of 40 $\mu\text{g}/\text{L}$. The low phosphorus concentrations resulted in significantly less algae production in 2005. The average chlorophyll-a concentration was 4 $\mu\text{g}/\text{L}$, which is below the laboratory detection limit. Consequently, Weaver Lake had excellent water clarity conditions in 2005. The average secchi depth transparency for Weaver Lake was 5 m. This high value was partially caused by a clear water phase that developed in May with water clarity conditions of 10.2 and 8.1 m. Throughout the remainder of the season, secchi depth measurement exceeded water quality goals, which ranged between 2.6 to 6.7 m.

The Weaver Lake water quality conditions in 2005 significantly improved relative to the declining water quality trend that has occurred the past ten years. Several factors may have contributed to the significant improvement in water quality conditions. Weaver Lake water quality conditions are significantly influenced by the amount watershed nutrient loading that the lake receives. The variation in watershed nutrient loading is mainly due to changes in the annual precipitation. However, the amount of precipitation in 2005 was above average. In 2004, a legislative law was implemented to limit the use of phosphorus fertilizer throughout the seven county metropolitan area to reduce potential watershed phosphorus loading. Weaver Lake may have received less phosphorus loading from the watershed as a consequence of the ban on phosphorus fertilizer.

Weaver Lake water quality may have also been influenced by the senescence of curlyleaf pondweed. Weaver Lake has a substantial amount of curlyleaf pondweed that inhibits potential recreational use. Consequently, a substantial amount of internal loading is due to the plant senescence. The released nutrients from the senescence of curlyleaf pondweed often resulted in an algae bloom that persists throughout the summer. In 2005, a whole lake Fluoridone herbicide treatment was completed in Weaver Lake in an attempt to control curlyleaf pondweed. There was significantly less curlyleaf pondweed in Weaver Lake due to the herbicide treatment. An increase in phosphorus concentration from 20 $\mu\text{g}/\text{L}$ at the end of June to 38 $\mu\text{g}/\text{L}$ in early July suggests that there was some curlyleaf pondweed remaining within the lake. However, it appears that the senescence of curlyleaf pondweed did not further influence the water quality conditions for the remaining portion of the year. A significant decrease in the amount of curlyleaf pondweed in Weaver Lake would reduce the amount of internal nutrient loading, and subsequently improve water quality conditions.



These two factors may have significantly influenced the water quality conditions in Weaver Lake for 2005. Unfortunately, it is difficult to determine the influence that each potential factor may have had on improving water quality conditions. Additional monitoring efforts would be necessary to determine the influence each potential factor may have had on the water quality conditions. Consequently, it becomes critical to further monitor Weaver Lake to determine potential changes in water quality conditions.

French Lake

French Lake has impaired water quality conditions that inhibit recreational use. Unfortunately, the lake does not have any long term monitoring data to determine whether there are any water quality trends.

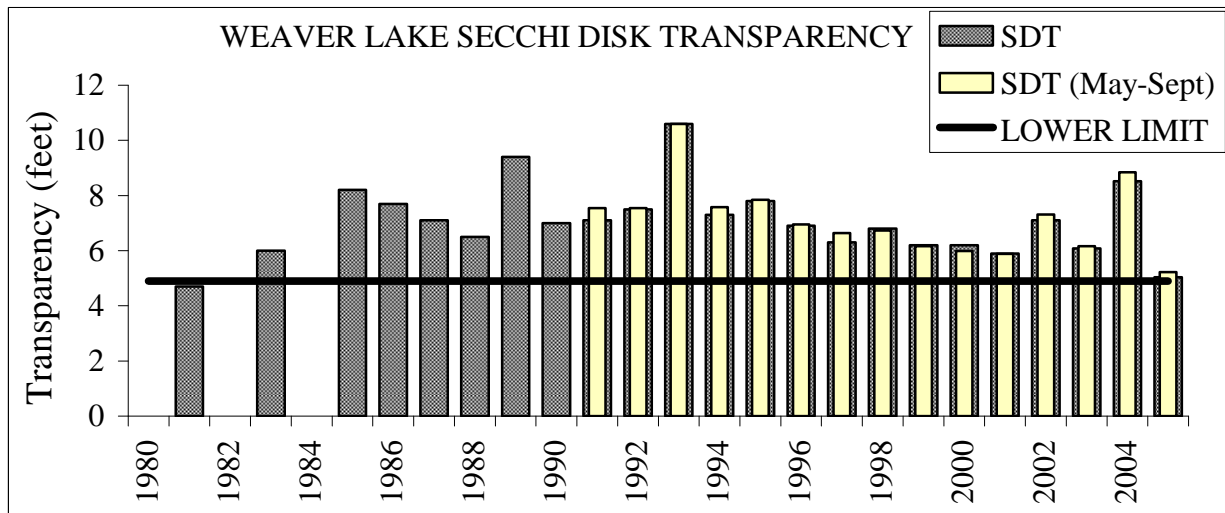
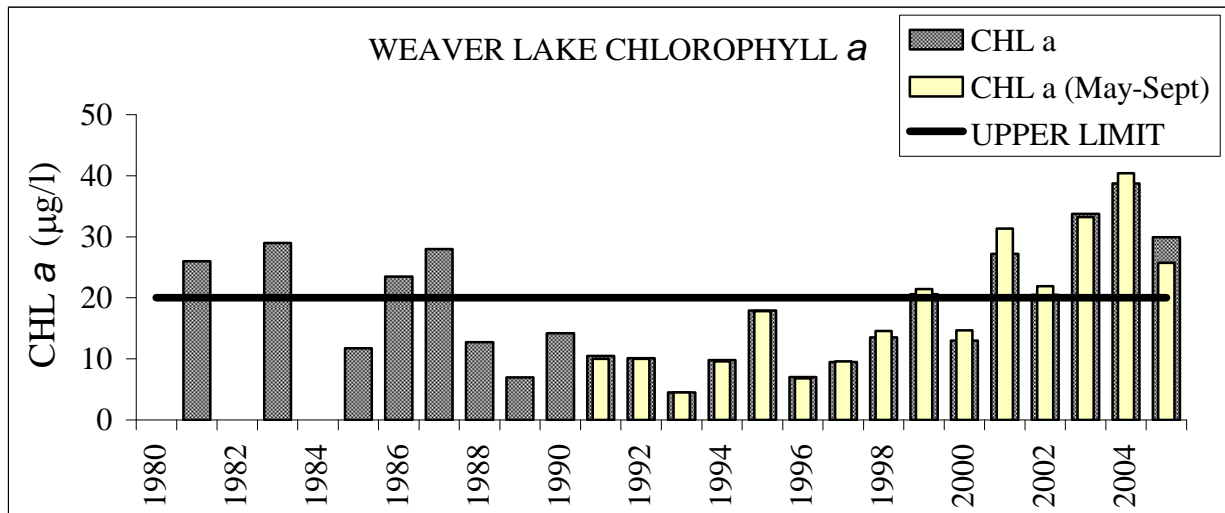
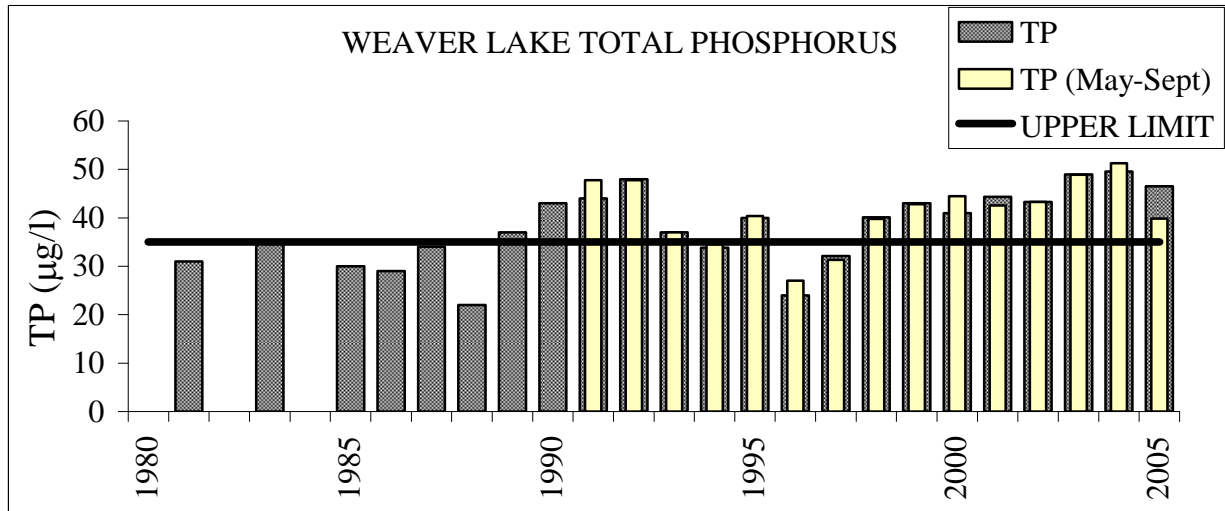
Despite the absence of long term water quality data, it is apparent from the data collected in 2005 that the lake has had a history of severe eutrophic conditions. The average phosphorus concentration in 2005 was 347 $\mu\text{g}/\text{L}$ with values ranging between 116 and 539 $\mu\text{g}/\text{L}$. The excessive amount of phosphorus in the lake causes severe algae blooms.

The average chlorophyll-a concentration was 260 $\mu\text{g}/\text{L}$ in 2005. Seasonal variation in chlorophyll-a concentrations ranged between 6 $\mu\text{g}/\text{L}$ in the early spring to 525 $\mu\text{g}/\text{L}$ in the summer. Consequently, water clarity conditions were extremely poor in which secchi depth measurements ranged between 0.16 m to 1.2 m. The severe algae blooms provided a shading effect that inhibited the development of a diverse aquatic plant community.

The poor water quality conditions are partially due to large amounts of watershed nutrient loading from surrounding agricultural areas. In addition, the shallow morphology of the lake with the absence of a diverse aquatic plant community is conducive for internal loading of nutrients that are re-suspended from the sediments. The lake is frequently vulnerable to winter and summer fish kills due to the extreme eutrophic conditions.



Appendix 4 Historical Water Quality Data



Appendix 4 Water Quality Data

Weaver Lake, 2005

