

# 11 LORING POND

## HISTORY

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Loring Pond was previously known as two bodies of water, Jewett Lake and Johnson's Pond, before the two were connected. It was named in 1890 in honor of Charles M. Loring, first president of the Board of Park Commissioners, who is known as the "Father of the Minneapolis Park System". Loring Park, acquired in 1883, was originally referred to as Central Park. The smaller north basin, originally a wetland, was dredged between 1883 - 1884 and again during 1976 - 1977 after new storm sewer construction diverted stormwater flow around the lake. Diverting the stormwater reduced the watershed area of Loring to 24.13 acres of parkland causing a net loss of water to the lake annually. Figure 11A shows a photograph of Loring Pond. Table 11A shows the morphometric data.

Several attempts were made, in the 1970s, to improve water quality in Loring Pond. An Olszewski tube was installed in the 1970s to drain lesser quality hypolimnetic water, however, the tube never functioned properly. Dredging of the north arm, as mentioned above, also did not improve the water quality of the lake. However, augmentation of the lake level with groundwater appears to have had a positive effect and continues through the present.

Further lake restoration and park improvement projects were initiated in 1997. The lake bottom was sealed and lined and an aerator was installed to help prevent oxygen depletion during the summer months. Multiple vegetation restoration projects were completed throughout the park including a native shoreline restoration, which provides a buffer strip for waterfowl management, protects against shoreline erosion, filters pollutants and has greatly improved the aesthetics of the lake. Also, a fishing/observation pier, bike and pedestrian trails and horseshoe courts were installed to increase recreational opportunities at the park.



**Figure 11A. Photograph of Loring Pond.**

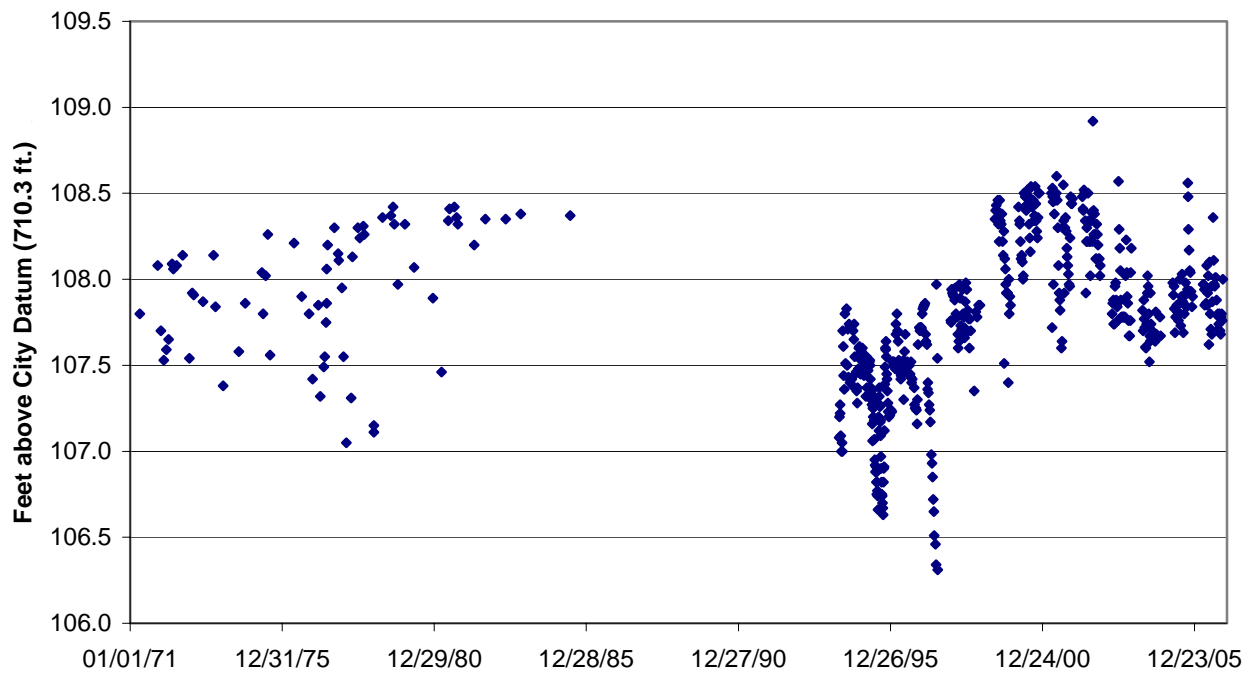
**Table 11A. Loring Pond morphometric data.**

Surface Area (acres)	Mean Depth (m)	Maximum Depth (m)	Volume (m <sup>3</sup> )	Watershed Area (acres)	Watershed: Lake Area (ratio)
8	1.5	5.3	4.88x10 <sup>4</sup>	24	3.0

## LAKE LEVEL

Lake levels for Loring Pond are recorded weekly during ice free conditions. The historical lake levels for Loring Pond are shown in Figure 11A for the entire period of record. Mean sea level elevation can be calculated by adding the city datum (710.3 feet) to the elevations shown in Figure 11B. Loring Pond lake levels are influenced by an augmentation well that is used to pump groundwater into the lake periodically throughout the year to maintain a consistent level.

See Section 18 for a comparison between other MPRB lake levels.



**Figure 11B. Historical lake levels for Loring Pond.**

## AUGMENTATION WELLS

An augmentation well is used to maintain the water levels at Loring Pond. The Minnesota Department of Natural Resources (MDNR) issues the permits and determines pumping limits for augmentation wells. The MPRB staff records groundwater usage monthly. Annual fees and reports are sent to the MDNR.

Tables 11B and 11C show the 2006 augmentation well readings and annual usage from 2004-2006. In 2006, the Loring Pond augmentation well use was below the MDNR allotted groundwater pumping volume.

**Table 11B. 2006 Loring Pond monthly augmentation well volumes (gallons).**

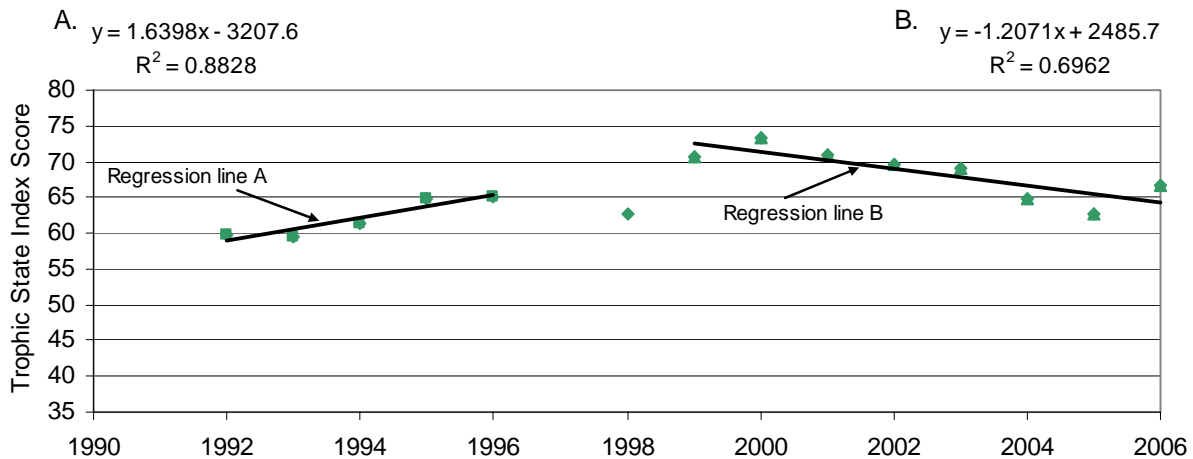
January – April	May	June	July	August	September–December
0	781,500	1,099,500	1,099,500	1,843,500	2,997,000

**Table 11C. Loring Pond year end augmentation well volumes (gallons).**

Gallons Permitted	2004 Total	2005 Total	2006 Total
12,000,000	5,742,000	5,844,000	7,821,000

## WATER QUALITY TRENDS (TSI)

The Loring Pond TSI score has been dropping since equilibrating after restoration activities were undertaken in 1997-1998. A detailed explanation of TSI can be found in Section 1. Figure 11C shows the TSI data and regression pre- and post-restoration. Prior to restoration activities the Loring water quality was degrading, shown by the strong increasing TSI trend (regression line A, Figure 11C). Restoration activities started in 1997 significantly manipulated the pond causing major shifts in clarity and TSI. Since equilibrating from the disturbance, the TSI score has been decreasing steadily (regression line B, Figure 11C).

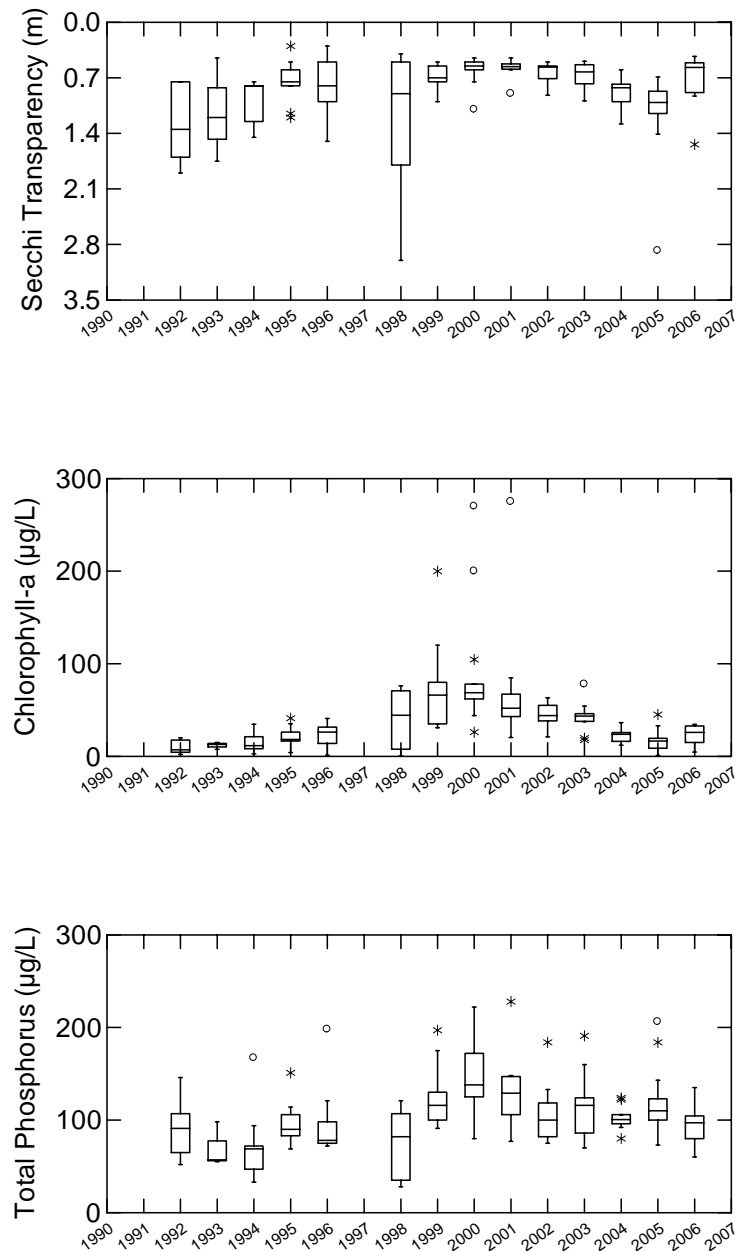


**Figure 11C. Loring Pond TSI data and regression analysis from 1990 to 2006. Regression line A indicates the trend in TSI prior to restoration activities. Regression line B represents the trend post-restoration. The lake was significantly manipulated during 1997 and 1998. TSI scores representing these years were not used in the regression analysis.**

Loring Pond has a TSI score that is below average for this ecoregion. Since the 1997 restoration, Loring Pond is showing gradual improvement. It falls between the 50th and bottom 25th percentile category for lakes in this ecoregion (based on calculations from the Minnesota Pollution Control Agency, using the Minnesota Lake Water Quality Data Base Summary, 2004).

## BOX AND WHISKER PLOTS

The box and whisker plots show in more detail the scatter within the years data set for the Secchi, chlorophyll-*a* and total phosphorus. Long-term lake monitoring is necessary to evaluate the seasonal and year-to-year variations seen in each lake and predict trends. A detailed explanation of box and whisker plots can be found in Section 1. Figure 11D shows the box and whisker plots of TSI data. The box and whisker plots in 2006 show an decrease in the median phosphorus concentration from the several previous years; however, secchi transparency was lower and chlorophyll-*a* higher than the preceding two years.



**Figure 11D. Box and whisker plots of Loring Pond TSI data.**

## LAKE AESTHETIC AND USER RECREATION INDEX (LAURI)

The LAURI for Loring Pond is shown in Figure 11E. Loring Pond scored “excellent” in aquatic plants and aesthetics and “poor” in water clarity. Loring Pond does not have a swimming beach and was therefore not scored for public health. Details on LAURI can be found in Section 1.

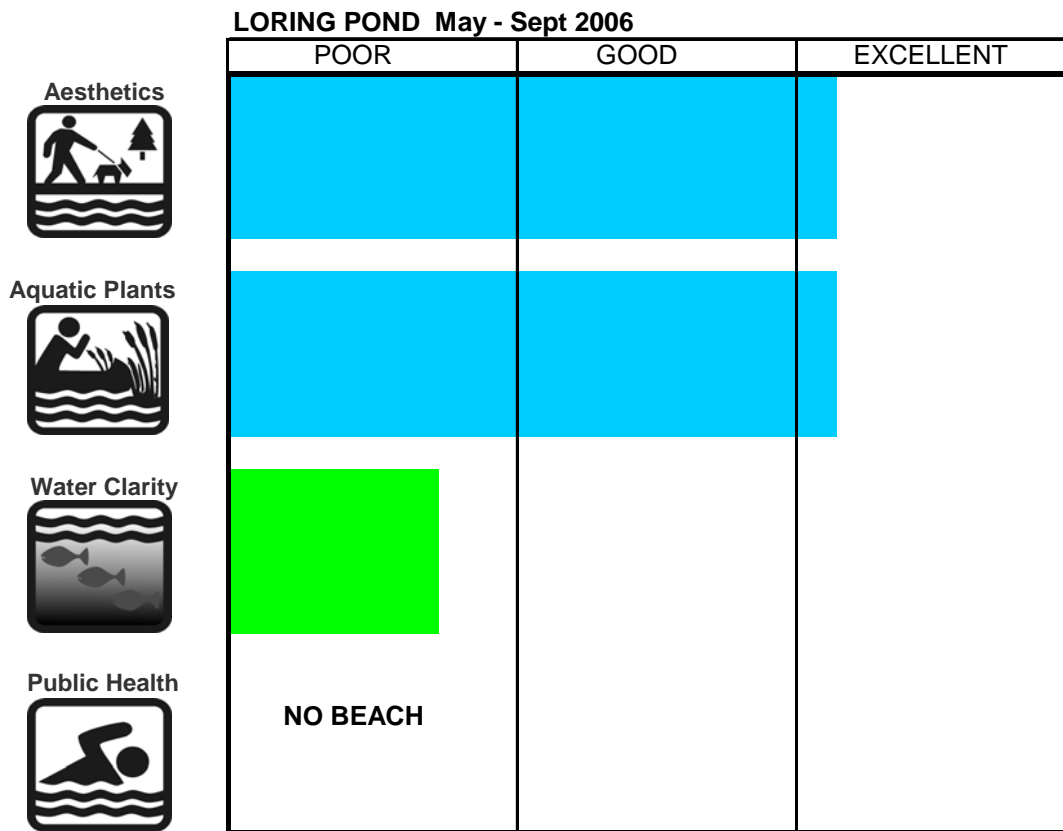


Figure 11E. The 2006 LAURI for Loring Pond.

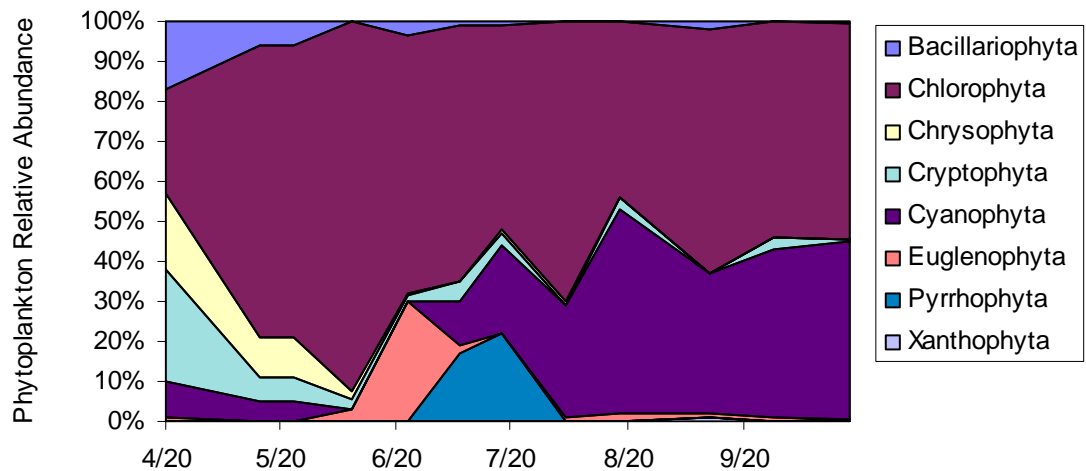
## WINTER ICE COVER

Ice came off Loring Pond on April 3, 2006, which was average. Ice came on the pond December 4, 2006 which was two weeks earlier than average. Loring Pond is a popular spot for geese, ducks and gulls and some years, waterfowl keep an open hole of water from freezing. See Section 1 for details on winter ice cover records and Section 18 for a comparison with other lakes.

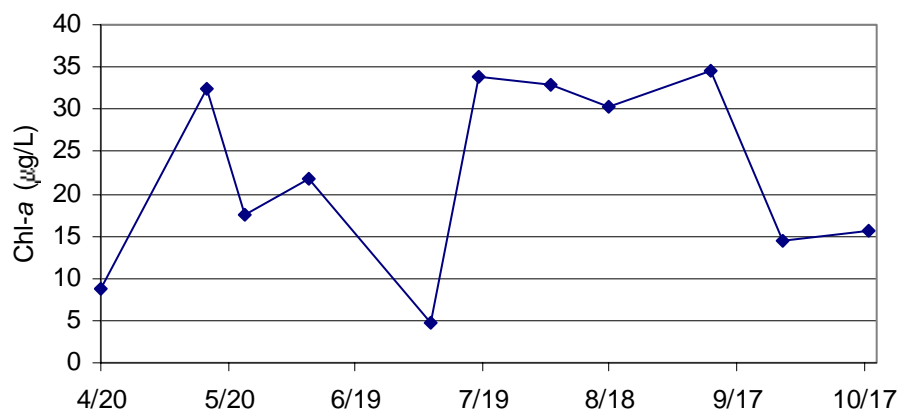
## PHYTOPLANKTON AND ZOOPLANKTON

Phytoplankton and zooplankton are the microscopic plant and animal life that form the basic food web of lake ecology. The greenness of a lake is measured by chlorophyll-*a* (chl-*a*) as an expression of the phytoplankton present. Figures 11F and 11G show the phytoplankton and chlorophyll-*a* data for the 2006 sampling season. The percent dominant refers to phytoplankton divisions. The dominant division throughout the year was chlorophyta (green algae). The spring

chlorophyll-*a* peak occurred as chlorophyta grew to more than 70% of the total phytoplankton community. Late summer highs in chl-*a* correlate with peaks in the cyanobacteria population of Loring Pond. Figure 11H shows the distribution of zooplankton in Loring pond during the 2007 sampling season. Loring pond has high concentrations of zooplankton compared to the other lakes. The high numbers of zooplankton may be due to the abundance of chlorophytes (green algae), a highly edible and nutritious alga. In 2007, rotifers peaked in April, and arthropods increased throughout the summer peaking in July.



**Figure 11F. Loring Pond 2006 relative abundance of phytoplankton divisions. Chlorophyta (green-algae) dominated throughout the season. Cyanophyta were not significantly abundant until late summer, and never made up more than half of the total community.**



**Figure 11G. Loring Pond 2006 chlorophyll-a data.**

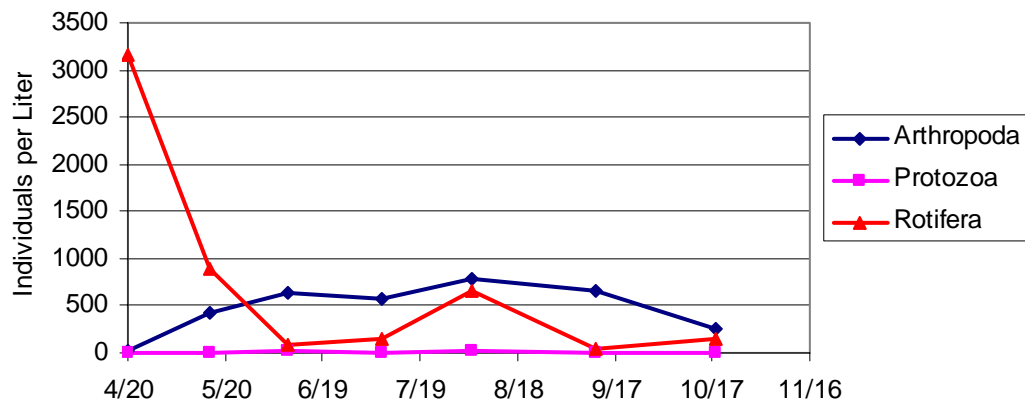


Figure 11H. Zooplankton distribution during the Loring Pond 2006 sampling season.

## FISH STOCKING

Additional information and a definition of fry, fingerling, yearling, and adult fish sizes can be found in Section 1.

Loring Pond was stocked by MDNR in:

- 2001 with 417 adult Black Crappie, 465 adult Bluegill Sunfish
- 2002 with 268 adult Black Crappie, 423 adult Bluegill Sunfish
- 2003 with 107 adult Black Crappie, 417 adult Bluegill Sunfish
- 2004 with 102 adult Black Crappie, 485 adult Bluegill Sunfish
- 2005 with 100 adult Black Crappie, 402 adult Bluegill Sunfish, 50 adult Channel Catfish
- 2006 with 102 adult Black Crappie, 400 adult Bluegill Sunfish, 50 adult Channel Catfish

## WATER QUALITY PROJECTS

In August of 2006, three sediment cores were taken at Loring pond in order to characterize the sediment for a dredging feasibility analysis. MPRB staff took three cores from Loring Pond's northwest bay. The locations were the south end of the bay (north of the foot bridge), east side of the bay, and north end of the bay. The average depth of the cores was 9.3 inches. The cores were sent to Braun Intertec for analysis. The average moisture content was 40% and two cores (north and east) were classified as silty sand and one (south) as sandy organic silt. Average carbon content was 3%. The chemical analysis of the dredged material required a tier 2 classification due to elevated soil reference values of arsenic and copper. The elevated metals content of the sediments may be due to the historic use of herbicides and pesticides within the park (outdated chemicals that are no-longer in use), use of wood preserved with chromated copper arsenate, flux of metals from the clay liner, or the contribution from stormwater. Tier 2 dredged materials are not suitable for residential or agricultural reuse but are for industrial or recreational reuse.