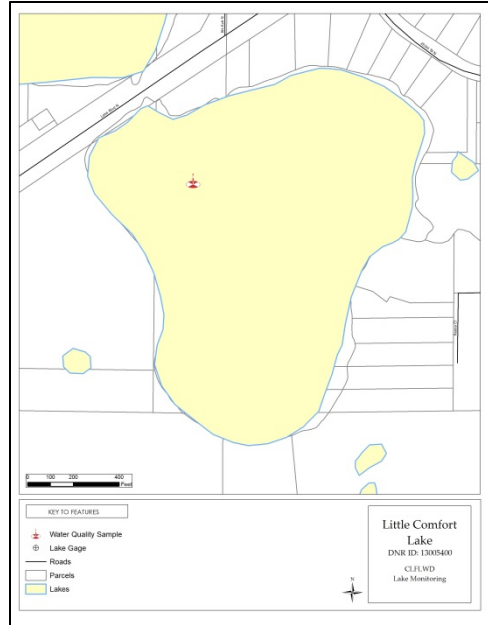


## Little Comfort Lake

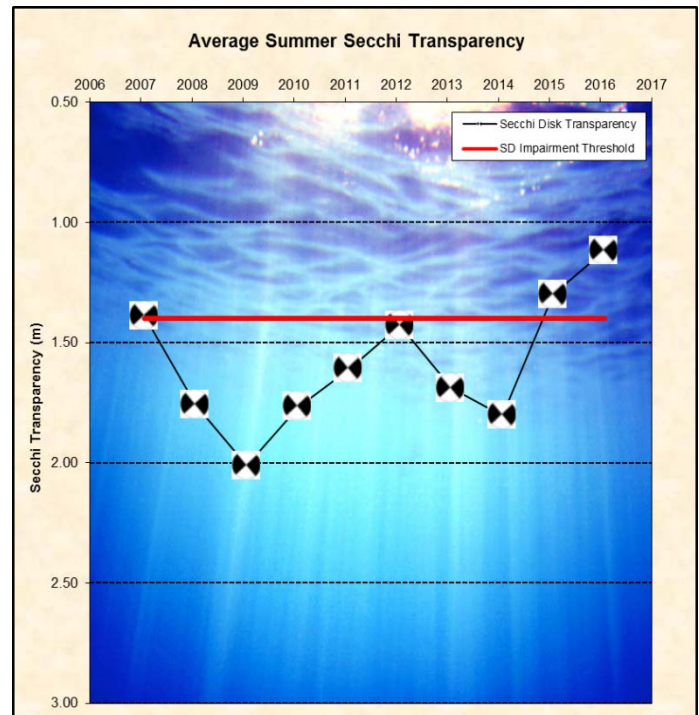
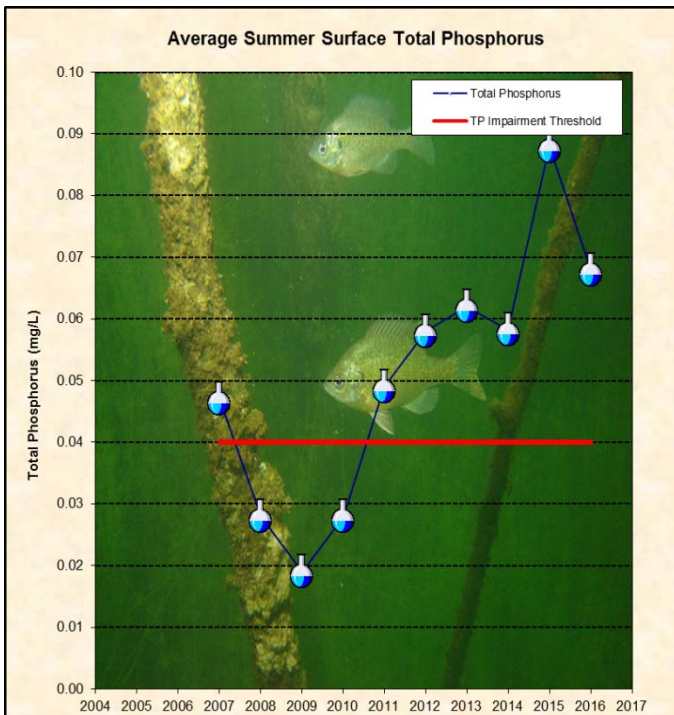
### 2016 Lake Grade: C

- DNR ID #: 13005400
  - Municipality: Chisago City
  - Location: Section 27 T33N-R21W
  - Lake Size: 36 acres
  - Maximum Depth (2016): 54 ft.
  - Ordinary High Water Mark: 887.2 ft.
  - 44% Littoral
- Note: Littoral area is the portion of the lake <15 ft. and dominated by aquatic vegetation.

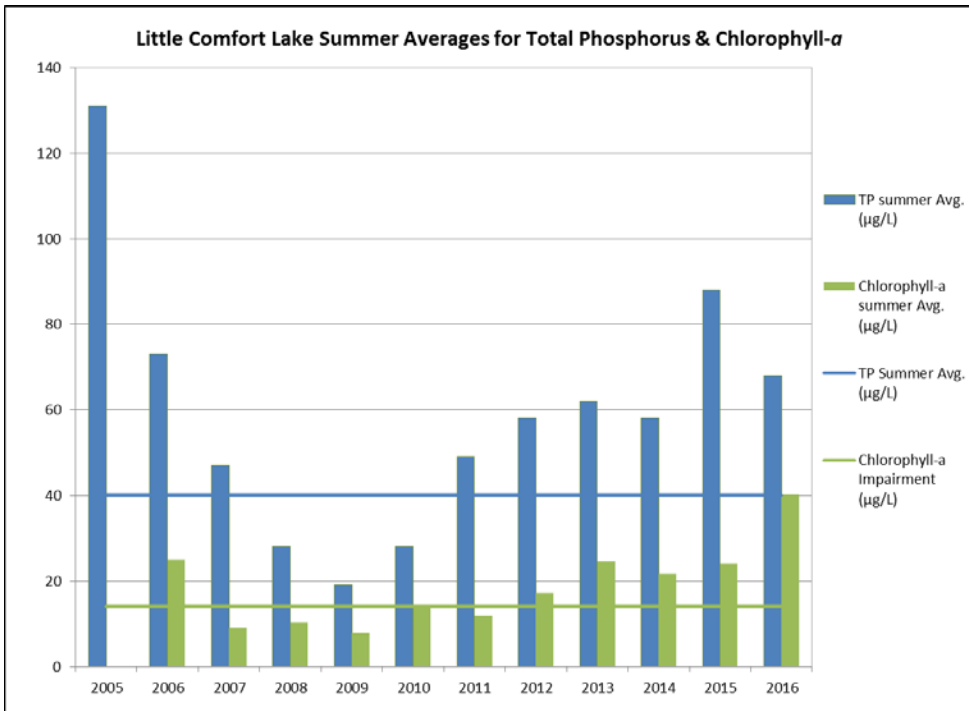


### Summary Points

- Based on the chlorophyll-*a* results Little Comfort Lake was considered eutrophic in 2016, according to the Carlson Trophic State Index.
- Using the 2-tailed Kendall Tau correlation test ( $p < 0.05$ ) there is no trend for the average total phosphorus and for the average Secchi transparency at this time.
- The major land use is rural/agricultural.
- The lake stratified in 2016 with the thermocline varying between 3 and 5 meters.
- Little Comfort Lake is listed as impaired for nutrients on the Minnesota Pollution Control Agency's Impaired Waters List.
- Curly-leaf pondweed (invasive aquatic plant) is present in this lake. A report has been made of the presence of Eurasian watermilfoil but that has yet to be verified.



Date/Time	Total Phosphorus (mg/L)	Uncorrected Trichromatic Chlorophyll-a (µg/L)	Pheophytin-Corrected Chlorophyll-a (µg/L)	Total Kjeldahl Nitrogen (mg/L)	Secchi Disk Depth (m)	Surface Temperature (Celsius)	Surface Dissolved Oxygen (mg/L)
4/18/2016 13:02	0.040	17.0	15.0	1.00	1.37	15.2	12.50
5/2/2016 14:52	0.029	8.5	6.8	0.98	1.52	16.2	10.25
5/17/2016 11:30	0.017	3.4	2.8	0.86	3.05	14.9	9.77
6/1/2016 10:54	0.034	11.0	8.8	0.92	1.52	20.9	7.40
6/14/2016 11:14	0.028	19.0	18.0	1.10	1.52	23.0	7.46
6/27/2016 10:50	0.176	43.0	40.0	1.50	0.76	24.8	7.56
7/12/2016 9:54	0.044	27.0	24.0	1.20	1.22	24.5	6.65
7/26/2016 9:58	0.050	36.0	33.0	1.30	0.91	27.3	9.93
8/9/2016 12:25	0.061	51.0	50.0	1.30	0.76	25.7	7.35
8/23/2016 10:02	0.056	31.0	28.0	1.20	1.22	22.1	4.97
9/8/2016 9:21	0.071	90.0	86.0	1.40	0.91	21.7	7.22
9/21/2016 9:09	0.092	77.0	74.0	1.40	1.22	19.8	9.11
10/5/2016 9:15	0.052	31.0	29.0	1.20	1.37	16.6	7.94
10/17/2016 9:47	0.040	20.0	18.0	1.10	1.60	13.5	7.26
<b>2016 Average</b>	0.056	33.2	31.0	1.18	1.36	20.4	8.24
<b>2016 Summer Average</b>	0.068	42.8	40.2	1.26	1.12	23.3	7.52
<b>Volunteer Data</b>							
4/18/2016 13:00	0.025	4.2	3.3	0.70	1.40	17.1	NA
5/4/2016 14:00	0.029	3.5	2.7	0.75	1.60	18.0	NA
5/20/2016 11:00	0.029	6.7	4.9	0.72	1.70	18.7	NA
6/2/2016 13:00	0.028	5.8	4.5	0.77	1.80	19.4	NA
7/13/2016 14:00	0.039	22.0	21.0	0.97	1.90	26.5	NA
7/25/2016 11:00	0.039	30.0	29.0	1.00	1.60	26.8	NA
8/11/2016 11:00	0.042	11.0	8.8	0.89	2.00	26.3	NA
<b>2016 Average</b>	0.033	11.9	10.6	0.83	1.71	21.8	NA
<b>2016 Summer Average</b>	0.037	17.2	15.8	0.91	1.83	24.7	NA
Water quality thresholds are 0.04 mg/L TP, 14 µg/L CL-a, 1.4 m Secchi depth*							
Shallow lake water quality thresholds are 0.06 mg/L TP, 20 µg/L CL-a, 1.0 m Secchi depth*							
	<b>High</b>	<b>High Date</b>	<b>Low</b>	<b>Low Date</b>	<b>Average</b>		
<b>2016 Elevation (ft)</b>	NA	NA	NA	NA	NA		
*Data requirements and determinations of use assessment according to the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters: "Samples must be collected over a minimum of 2 years and data used for assessments must be collected from June to September. Typically, a minimum of 8 individual data points for TP, corrected chlorophyll-a (chl-a corrected for pheophytin), and Secchi are required. Data used for phosphorus and chlorophyll-a calculations are limited to those collected from the upper most 3 meters of the water column (surface). If more than one sample is collected in a lake per day, these values are averaged to yield a daily average value. Following this step, all June to September data for the 10-year assessment window are averaged to determine summer-mean values for TP, corrected chl-a, and Secchi depth. These values are then compared to the standards and the assessment is made."							



<b>Lake Water Quality Summary</b>										
	<b>Lake Grades</b>									
	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Total Phosphorus (mg/L)	C	D	C	C	C	C	B	A	B	C
Chlorophyll-a (µg/L)	C	C	C	C	B	B	B	A	C	A
Secchi depth (ft)	C	C	C	C	C	C	C	C	C	C
<b>Overall</b>	<b>C</b>	<b>C-</b>	<b>C</b>	<b>C</b>	<b>C+</b>	<b>C+</b>	<b>B-</b>	<b>B+</b>	<b>B-</b>	<b>B-</b>

## **Little Comfort Lake Water Surface Elevation Statistics**

Outlet Elevation: 885.7 ft.

Ordinary High Water Level (OHW) Elevation: 887.2 ft.

100 Year Flood Elevation (CLFLWD): 892.1 ft.

Highest Recorded Elevation: 887.81 ft. (05/08/2001)

Lowest Recorded Elevation: 885.41 ft. (09/05/2003)

Datum: NGVD 29 (ft.)

\*Elevation data has not been recorded on this lake since 2004.