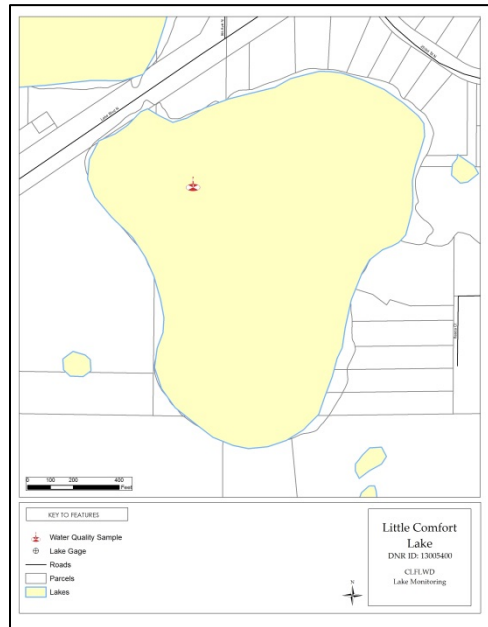


## Little Comfort Lake

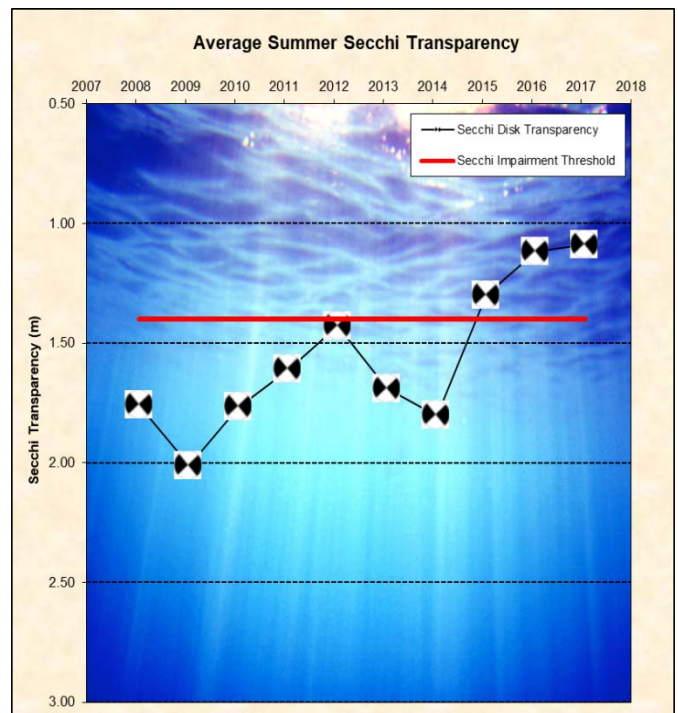
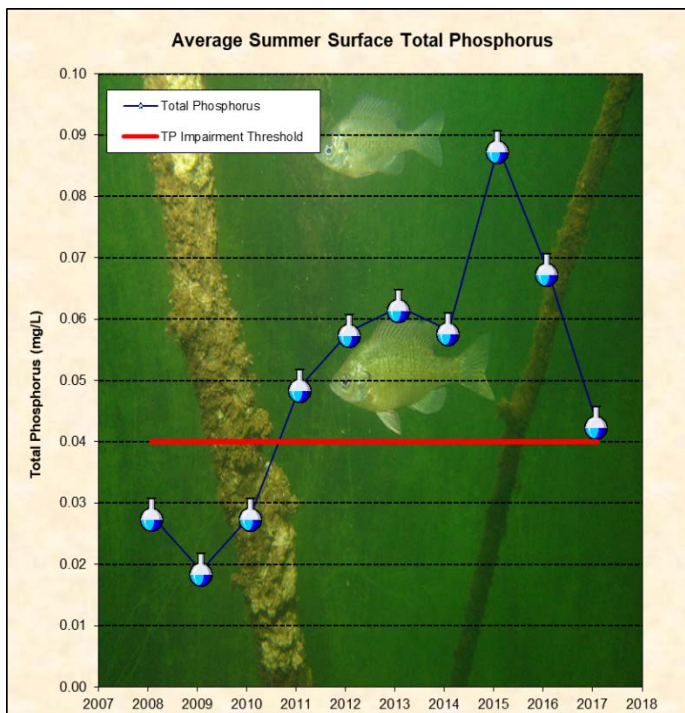
### 2017 Lake Grade: C

- DNR ID #: 13005400
  - Municipality: Chisago City
  - Location: Section 27 T33N-R21W
  - Lake Size: 36 acres
  - Maximum Depth (2017): 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.



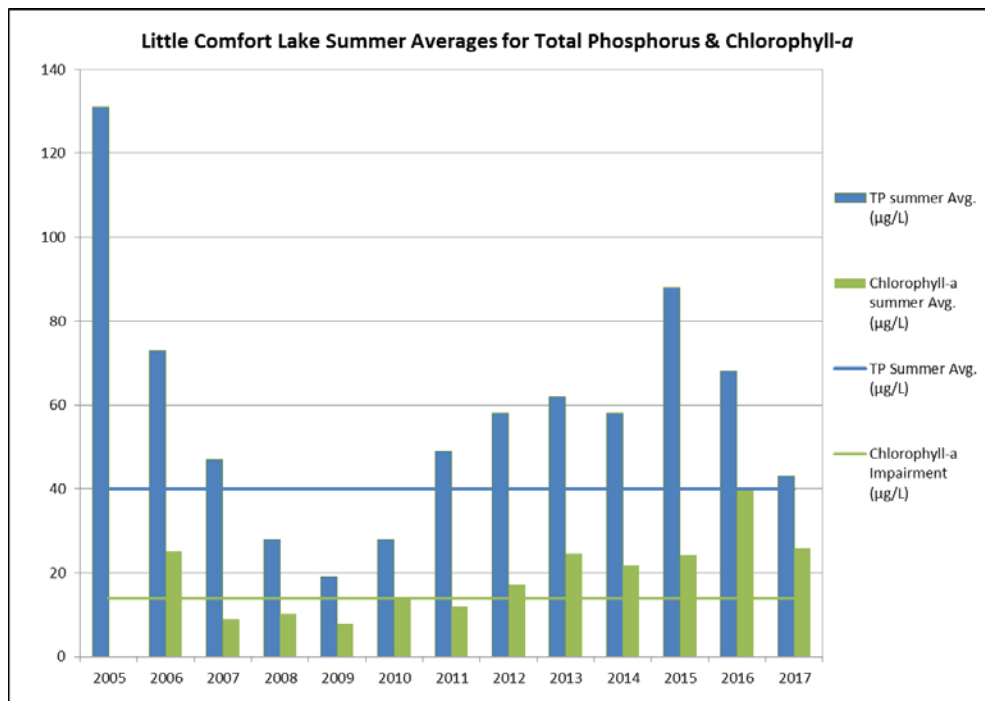
### Summary Points

- Based on the chlorophyll-*a* results Little Comfort Lake was considered eutrophic in 2017, according to the Carlson Trophic State Index.
- Using the 2-tailed Kendall Tau correlation test ( $p < 0.05$ ) there is a statistically significant **declining** trend for the average Secchi transparency at this time and average chlorophyll-*a* and no trend for the average total phosphorus.
- The major land use is rural/agricultural.
- The lake stratified in 2017 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)
4/19/2017 11:51	0.055	30.0	26.0	1.00	1.07	11.7	9.96
5/3/2017 9:08	0.037	11.0	7.6	0.86	1.68	9.9	9.81
5/17/2017 8:36	0.031	12.0	11.0	0.90	2.13	19.5	8.44
5/31/2017 14:49	0.030	11.0	10.0	0.86	1.68	17.3	8.28
6/14/2017 11:31	0.019	31.0	29.0	0.62	1.07	24.1	8.25
6/28/2017 9:26	0.042	28.0	26.0	1.20	0.91	20.3	8.01
7/12/2017 9:38	0.026	46.0	44.0	1.10	0.46	25.7	8.77
7/25/2017 10:13	0.063	30.0	28.0	1.20	0.61	24.5	7.28
8/9/2017 9:35	0.071	20.0	20.0	1.30	0.91	23.2	8.37
8/21/2017 10:37	0.034	24.0	23.0	1.10	1.07	23.7	8.80
9/5/2017 12:58	0.036	20.0	19.0	0.97	1.52	19.6	7.14
9/20/2017 11:34	0.050	18.0	17.0	0.92	2.13	19.6	7.21
10/3/2017 11:07	0.035	5.5	4.0	1.00	1.98	17.1	7.57
10/19/17 11:02	0.046	15.0	13.0	1.10	1.52	12.5	7.15
<b>2017 Average</b>	0.041	21.5	19.8	1.01	1.34	19.2	8.22
<b>2017 Summer Average</b>	0.043	27.1	25.8	1.05	1.09	22.6	7.98
<b>Volunteer Data</b>							
05/07/2017 15:00	0.046	8.1	5.3	0.81	0.90	16.4	NA
05/17/2017 13:00	0.027	7.6	6.2	0.84	0.90	17.6	NA
06/07/2017 11:00	0.040	14.0	13.0	1.20	0.90	21.4	NA
06/21/2017 13:00	0.047	23.0	22.0	1.10	1.00	24.1	NA
07/10/2017 14:00	0.028	14.0	14.0	0.98	1.20	28.5	NA
07/24/2017 13:00	0.052	16.0	14.0	1.20	1.20	29.2	NA
08/14/2017 15:00	0.022	10.0	8.5	0.84	1.50	28.7	NA
08/24/2017 13:00	0.028	7.5	6.4	0.82	1.90	24.9	NA
09/07/2017 14:00	0.023	7.4	5.7	0.81	2.00	24.2	NA
09/21/2017 13:00	0.032	5.6	4.8	0.70	2.10	21.7	NA
10/15/2017 14:00	0.031	8.7	7.3	0.94	3.20	NA	NA
<b>2017 Average</b>	0.034	11.1	9.7	0.93	1.53	23.7	NA
<b>2017 Summer Average</b>	0.027	7.8	6.5	0.82	1.48	25.3	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>2017 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."



Lake Water Quality Summary										
	Lake Grades									
	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Total Phosphorus (mg/L)	C	C	D	C	C	C	C	B	A	B
Chlorophyll-a (µg/L)	C	C	C	C	C	B	B	B	A	C
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>C+</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.