

Pleasant 11-0383-00

MN Lake ID: 11-0383-00
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: Upper Mississippi River
 Latitude/Longitude: 46.91666667 / -94.45861111
 Water Body Type: Public Waters
 Monitored Sites (Primary): 202
 Monitored Sites (Secondary): N/A

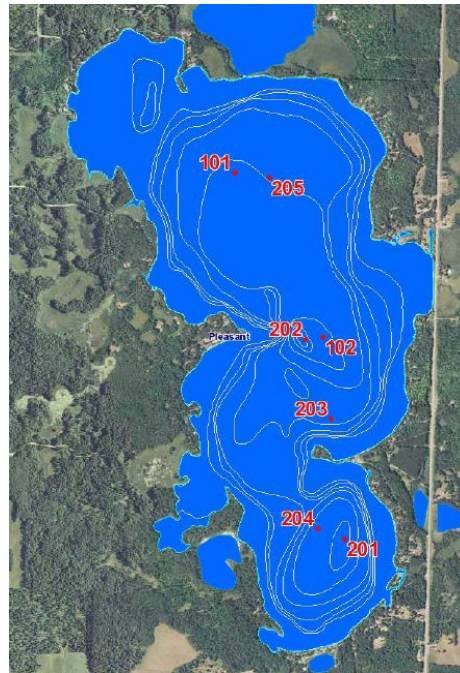
Physical Characteristics

Surface area (acres): 1038
 Littoral area (acres): 410
 % Littoral area: 39%
 Max depth (ft): 72 (m): 21.9
 Mean depth (ft): N/A (m): N/A
 Watershed size (acres): N/A

Water Quality Characteristics - Historical Means

Years monitored: 2007-2009

Parameters	Primary Site 202
Total Phosphorus Mean:	14.1
Total Phosphorus Min:	6
Total Phosphorus Max:	26
Number of Observations:	14
Chlorophyll-a Mean:	4.3
Chlorophyll-a Min:	1
Chlorophyll-a Max:	8
Number of Observations:	14
Secchi Depth Mean:	15.5
Secchi Depth Min:	9.5
Secchi Depth Max:	25.5
Number of Observations:	14
Trophic State Index Mean:	40.9
Trophic State:	Mesotrophic



Ecoregion Comparisons

Minnesota is divided into 7 ecoregions based on land use, vegetation, precipitation and geology. The MPCA has developed a way to determine the "average range" of water quality expected for lakes in each ecoregion.

From 1985-1988, the MPCA evaluated the lake water quality for chosen reference lakes. These reference lakes are not considered pristine, but are considered to have little human impact and therefore are representative of the typical lakes within the ecoregion. The "average range" refers to the 25th - 75th percentile range for data within each ecoregion.

Cass County is in the Northern Lakes and Forests Ecoregion. **Pleasant Lake** compares to the ecoregion average ranges as indicated below:



Total Phosphorus:	Within expected range, which indicates expected water quality for the area
Chlorophyll-a:	Within expected range, which indicates expected water quality for the area
Secchi Depth:	Better than expected range, which indicates better than expected water quality for the area

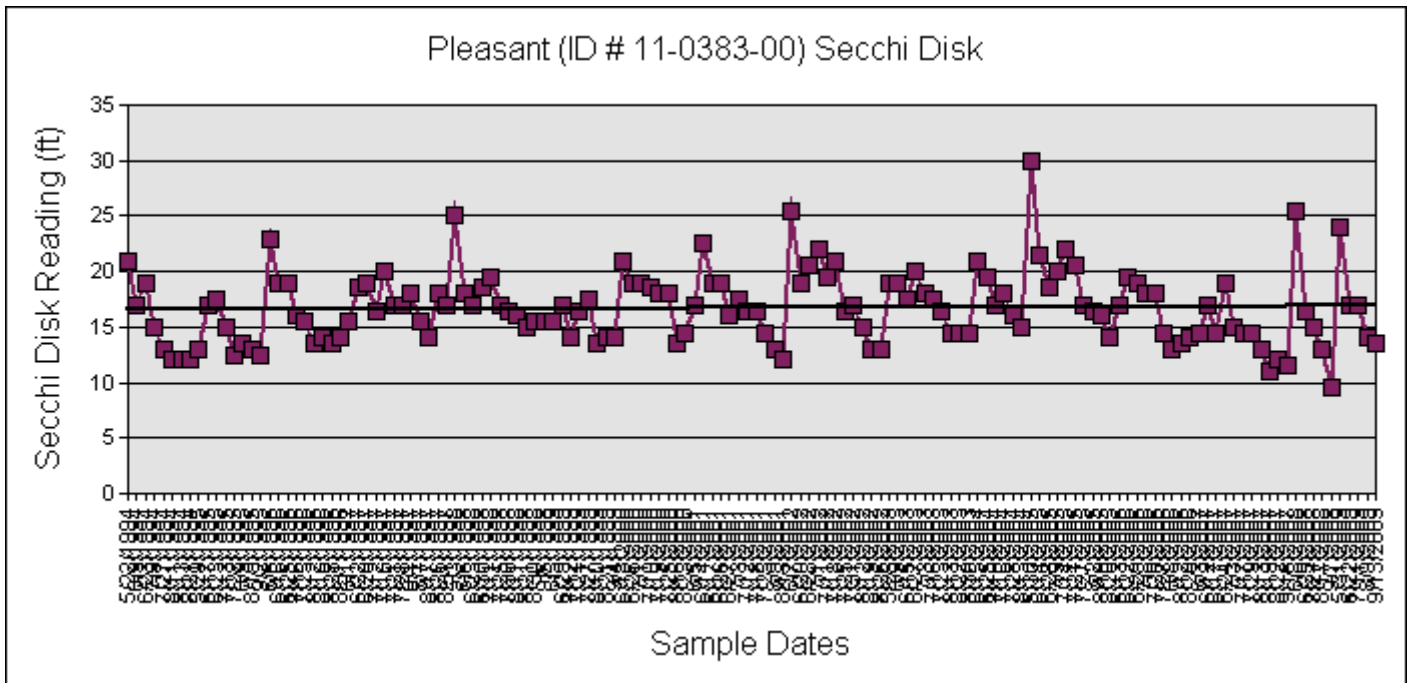
Trend Analysis Report

For detecting trends, a minimum of 8-10 years of data with 4 or more readings per season are recommended. Minimum confidence accepted by the MPCA is 90%. This means that there is a 90% chance that the data are showing a true trend and a 10% chance that the trend is a random result of the data. Only short-term trends can be determined with just a few years of data, because there can be different wet years and dry years, water levels, weather, etc., that affect the water quality naturally.

There is not enough historical data to perform trend analysis for total phosphorus or chlorophyll *a* on Pleasant Lake. Site 202 has enough transparency data to perform a long-term Secchi depth trend analysis. The data was analyzed using the Mann Kendall Trend Analysis.

County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Cass	11-0383-00	Pleasant	202 (Primary)	Secchi Disk	05-01-1994 - 09-30-2009	All Historical

No Significant Trend Exists



Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0383-00	Pleasant	202 (Primary)	06-01-2007 - 09-30-2009	RMB Lab

Historical Mean	14.1	4.3	15.5	41	43	38	40
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Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChIA ug/L	Secchi Ft.	TSI Phos.	TSI ChIAL	TSI Secchi Ft.	TSI Avg.
6/3/2007	12:00 PM	202	Jim Bedell	62144	RMB Lab	16	1	14.5	44	31	39	38
6/17/2007	1:30 PM	202	Jim Bedell	63202	RMB Lab	10	1	14.5	37	31	39	36
8/19/2007	3:00 PM	202	Jim Bedell	67019	RMB Lab	17	7	11	45	50	43	46
9/16/2007	1:30 PM	202	Jim Bedell	68579	RMB Lab	26	8	11.5	51	51	42	48
Annual Mean						17.2	4.2	12.9	44	40	40	42

Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChIA ug/L	Secchi Ft.	TSI Phos.	TSI ChIAL	TSI Secchi Ft.	TSI Avg.
6/8/2008	2:07 PM	202	Jerry Jorgensen	78419	RMB Lab	17	4	25.5	45	44	30	40
6/29/2008	6:50 PM	202	Jerry Jorgensen	80724	RMB Lab	9	4	16.5	36	44	37	39
7/27/2008	11:30 AM	202	Jerry Jorgensen	83569	RMB Lab	10	2	15	37	37	38	37
8/17/2008	1:30 PM	202	Jerry Jorgensen	85428	RMB Lab	10	4	13	37	44	40	40
9/7/2008	12:45 PM	202	Jerry Jorgensen	86939	RMB Lab	14	6	9.5	42	48	45	45
Annual Mean						12	4	15.9	39	43	38	40

Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChIA ug/L	Secchi Ft.	TSI Phos.	TSI ChIAL	TSI Secchi Ft.	TSI Avg.
5/31/2009	7:15 PM	202	Jerry Jorgensen	98217	RMB Lab	20	3	24	47	41	31	40
6/22/2009	9:05 AM	202	Jerry Jorgensen	101117	RMB Lab	6	4	17	30	44	36	37
7/11/2009	12:11 PM	202	Jerry Jorgensen	103453	RMB Lab	13	3	17	41	41	36	39
8/9/2009	12:30 PM	202	Jerry Jorgensen	107124	RMB Lab	16	5	14	44	46	39	43
9/13/2009	10:00 AM	202	Jerry Jorgensen	110768	RMB Lab	14	8	13.5	42	51	40	44
Annual Mean						13.8	4.6	17.1	40	44	36	40