

Blackwater 11-0274-00

MN Lake ID: 11-0274-00
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: Upper Mississippi River
 Latitude/Longitude: 46.90916667 / -94.30386111
 Water Body Type: Public Waters
 Monitored Sites (Primary): 202
 Monitored Sites (Secondary): 102

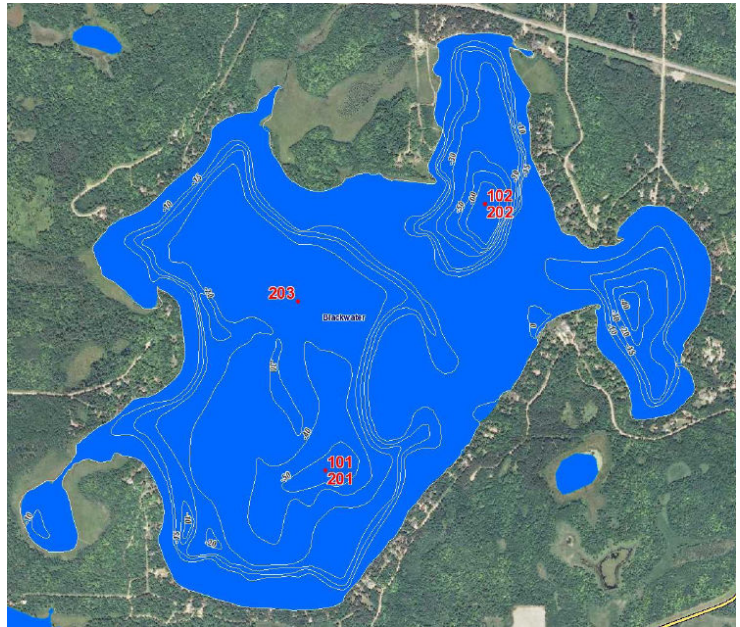
Physical Characteristics

Surface area (acres): 722
 Littoral area (acres): 336
 % Littoral area: 46%
 Max depth (ft): 67 (m): 20.4
 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:	12.4
Total Phosphorus Min:	9
Total Phosphorus Max:	17
Number of Observations:	14
Chlorophyll-a Mean:	3.3
Chlorophyll-a Min:	1
Chlorophyll-a Max:	6
Number of Observations:	14
Secchi Depth Mean:	14.2
Secchi Depth Min:	10.5
Secchi Depth Max:	17
Number of Observations:	14
Trophic State Index Mean (Primary Site):	40.2
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. **Blackwater Lake** compares to the ecoregion average ranges as indicated below:

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



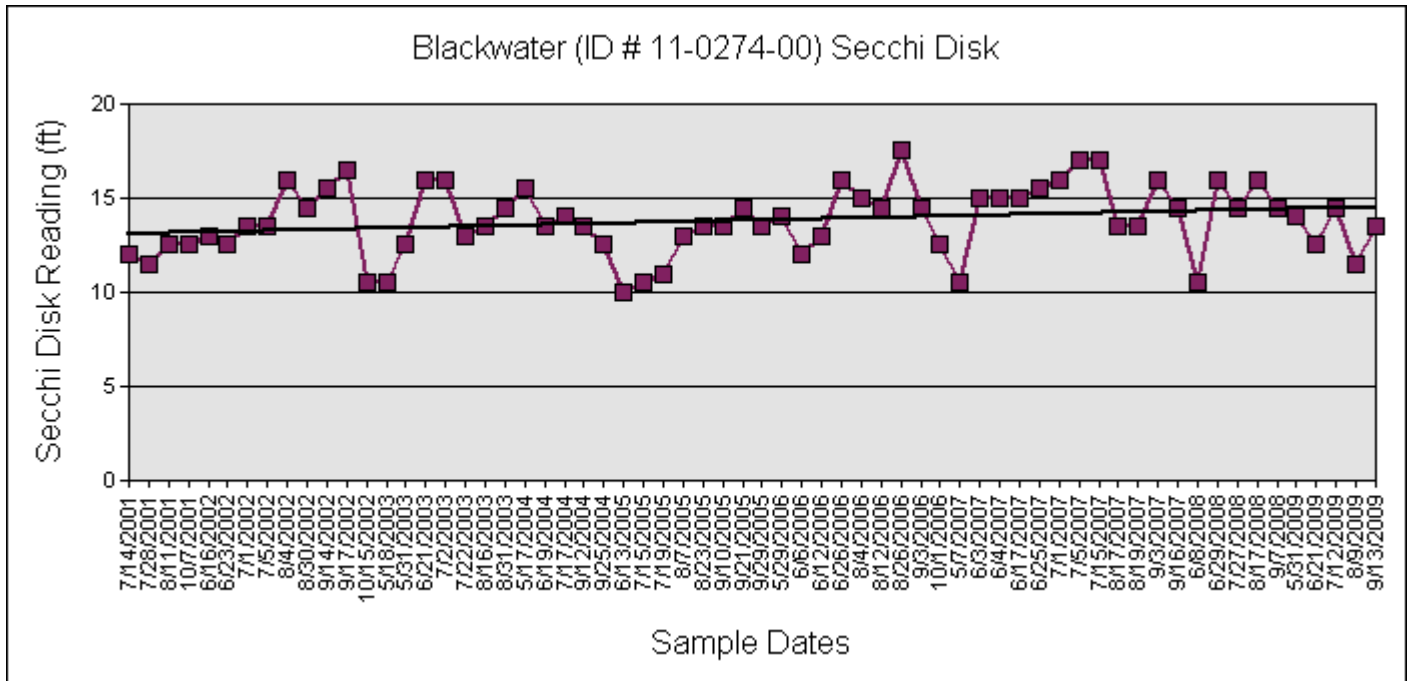
Trend Analysis Report

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 Blackwater 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	11-0274-00	Blackwater	202 (Primary)	Secchi Disk	07-01-2001 - 09-30-2009	All Historical

**The probability that a true significant trend exists is 95%
Secchi Disk is increasing, which indicates improving water quality.**



Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0274-00	Blackwater	202 (Primary)	06-01-2007 - 09-30-2009	RMB Lab

Historical Mean						12.3	3.3	14.2	40	41	39	40
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
6/3/2007	9:30 AM	202	Elmer Schwerin	62149	RMB Lab	11	4	15	39	44	38	40
6/17/2007	2:00 PM	202	Elmer Schwerin	63199	RMB Lab	12	3	15	40	41	38	40
7/15/2007	10:00 AM	202	Elmer Schwerin	65131	RMB Lab	11	2	17	39	37	36	37
8/19/2007	10:00 AM	202	Elmer Schwerin	67017	RMB Lab	10	5	13.5	37	46	40	41
9/16/2007	10:00 AM	202	Elmer Schwerin	68577	RMB Lab	16	5	14.5	44	46	39	43
Annual Mean						12	3.8	15	39	42	38	40
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
6/8/2008	2:11 PM	202	Jim Eller	78412	RMB Lab	17	2	10.5	45	37	43	42
6/29/2008	4:30 PM	202	Jim Eller	80720	RMB Lab	11	3	16	39	41	37	39
7/27/2008	8:30 AM	202	Jim Eller	83563	RMB Lab	10	4	14.5	37	44	39	40
8/17/2008	11:30 AM	202	Elmer Schwerin	85383	RMB Lab	9	3	16	36	41	37	38
9/7/2008	11:00 AM	202	Elmer Schwerin	86947	RMB Lab	12	4	14.5	40	44	39	41
Annual Mean						11.8	3.2	14.3	39	41	39	40
Date	Time	Site	Sampler	Lab Code	Data Source	TP ug/L	ChlA ug/L	Secchi Ft.	TSI Phos.	TSI ChlAL	TSI Secchi Ft.	TSI Avg.
5/31/2009	2:00 PM	202	Jim Eller	98193	RMB Lab	15	2	14	43	37	39	40
6/21/2009	2:00 PM	202	Jim Eller	101081	RMB Lab	14	1	12.5	42	31	41	38
7/12/2009	8:30 AM	202	Elmer Schwerin	103456	RMB Lab	12	2	14.5	40	37	39	39
8/9/2009	5:30 PM	202	Jim Eller	107115	RMB Lab	13	6	11.5	41	48	42	44
9/13/2009	9:30 AM	202	Bob Seemann	110778	RMB Lab	12	4	13.5	40	44	40	41
Annual Mean						13.2	3	13.2	41	39	40	40