

Wabedo 11-0171

MN Lake ID: 11-0171
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: Upper Mississippi River
 Latitude/Longitude: 46.91611111 / -94.20166667
 Water Body Type: Public Waters
 Monitored Sites (Primary): 202
 Monitored Sites (Secondary): 201, 501, 502

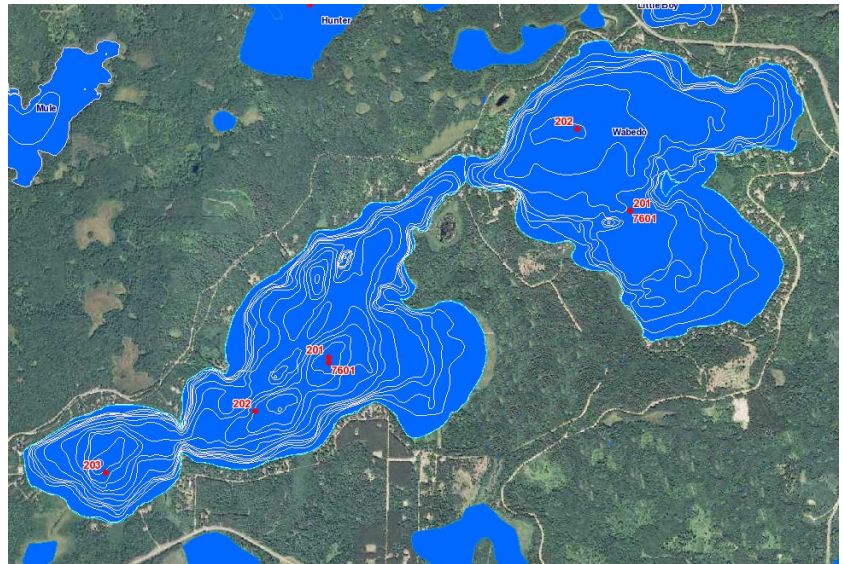
Physical Characteristics

Surface area (acres): 1,266
 Littoral area (acres): 295
 % Littoral area: 25%
 Max depth (ft): 95 (m): 15.2

Water Quality Characteristics - Historical Means

Years monitored: 1985-1990, 1992-2009

Parameters	NE Bay 202	SW Bay 202
Total Phosphorus Mean:	17	25.3
Total Phosphorus Min:	11	16
Total Phosphorus Max:	25	49
Number of Observations:	14	10
Chlorophyll-a Mean:	4.7	6.2
Chlorophyll-a Min:	1	3
Chlorophyll-a Max:	9	10
Number of Observations:	14	10
Secchi Depth Mean:	9.5	9.5
Secchi Depth Min:	6	7
Secchi Depth Max:	15	13.5
Number of Observations:	312	25
Trophic State Index Mean:		45



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. **Lake Wabedo** 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:	Within expected range, which indicates expected water quality for the area

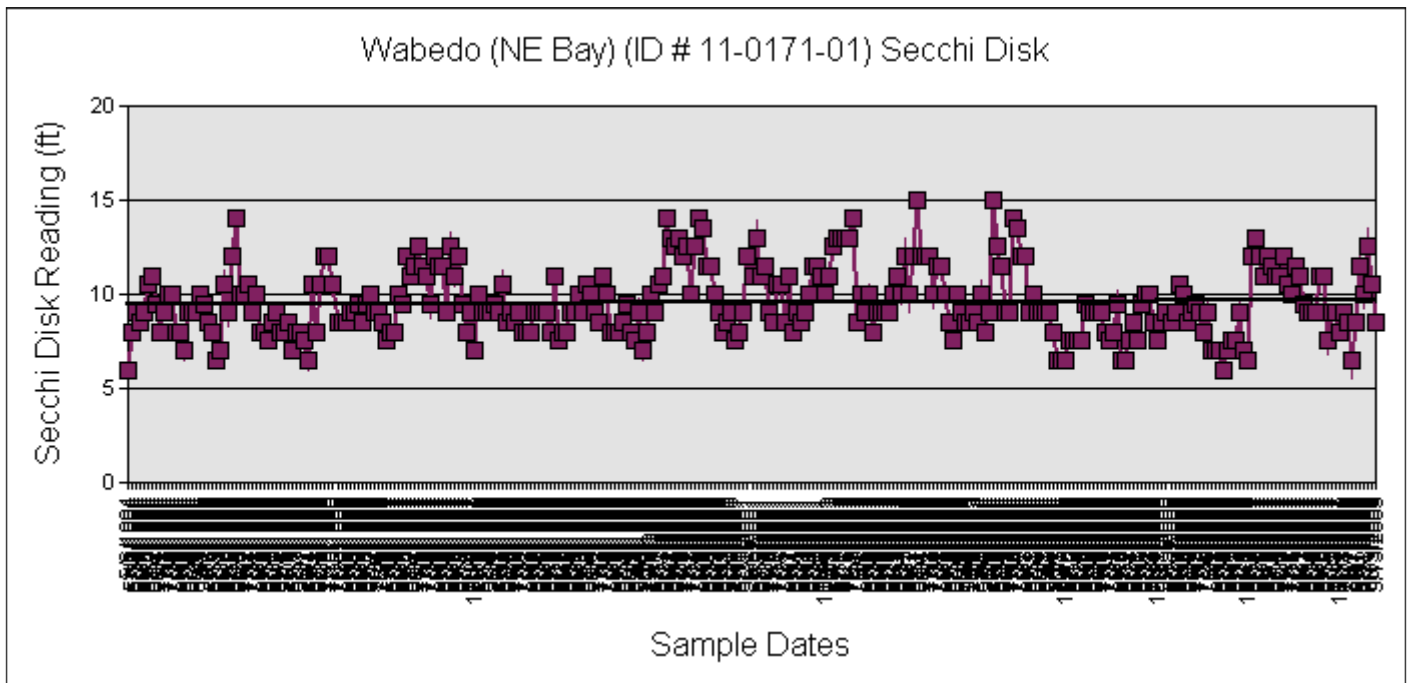
Trend Analysis Report

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 Lake Wabedo. Site 202 in the NE Bay and Site 201 in the SW Bay have enough transparency data to perform a long-term Secchi depth trend analysis. The data was analyzed using the Mann Kendall Trend Analysis.

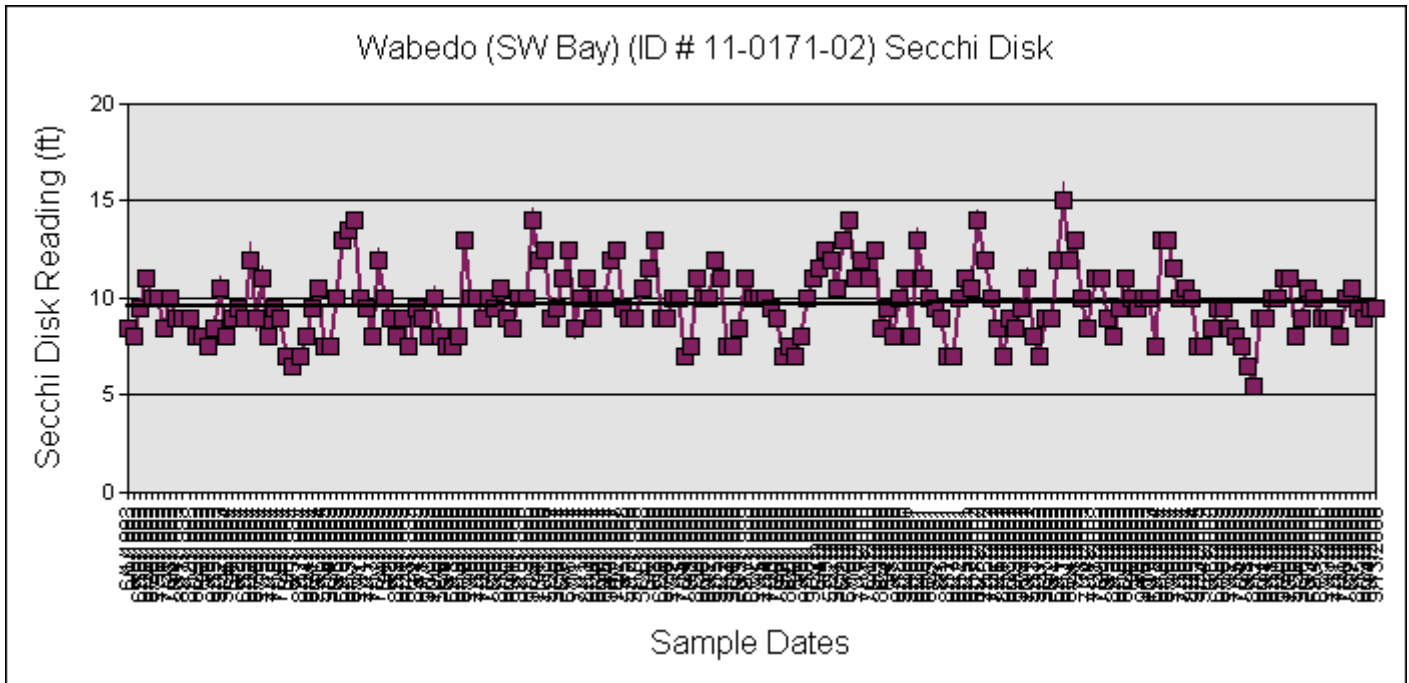
County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Cass	11-0171-01	Wabedo (NE Bay)	202	Secchi Disk	05-01-1994 - 09-30-2009	All Historical

No Significant Trend Exists



County	MN Lake ID	Lake	Site	Data Evaluated	Date Range	Data Source
Cass	11-0171-02	Wabedo (SW Bay)	201	Secchi Disk	06-01-1993 - 09-30-2006	All Historical

No Significant Trend Exists



Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0171-01	Wabedo (NE Bay)	202 (Primary)	06-01-2007 - 09-30-2009	RMB Lab

Historical Mean	17	4.7	9.7	44	44	44	44
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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.
6/18/2007	12:15 PM	202	Michael Plotnik	63198	RMB Lab	21	9	11.5	48	52	42	47
7/11/2007	11:00 AM	202	Michael Plotnik	64717	RMB Lab	13	5	10.5	41	46	43	43
8/13/2007	12:10 PM	202	Michael Plotnik	66523	RMB Lab	18	5	9.5	46	46	45	46
9/10/2007	10:30 AM	202	Michael Plotnik	67963	RMB Lab	18	7	8.5	46	50	46	47
Annual Mean						17.5	6.5	10	45	48	44	45

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	11:15 AM	202	Michael Plotnik	78451	RMB Lab	19	1	9	47	31	45	41
6/29/2008	11:30 AM	202	Michael Plotnik	80735	RMB Lab	15	4	N/A	43	44	N/A	44
7/27/2008	12:00 PM	202	Michael Plotnik	83602	RMB Lab	17	4	8.5	45	44	46	45
8/17/2008	10:30 AM	202	Michael Plotnik	85417	RMB Lab	11	5	6.5	39	46	50	45
9/7/2008	11:35 AM	202	Michael Plotnik	86953	RMB Lab	15	5	8.5	43	46	46	45
Annual Mean						15.4	3.8	8.1	43	42	46	44

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	10:40 AM	202	Ronald Anderson	98195	RMB Lab	25	2	11.5	51	37	42	43
6/22/2009	8:00 AM	202	Michael Plotnik	101090	RMB Lab	20	5	10	47	46	44	46
7/11/2009	7:00 AM	202	Michael Plotnik	103448	RMB Lab	13	3	12.5	41	41	41	41
8/9/2009	3:30 PM	202	Michael Plotnik	107109	RMB Lab	20	5	10.5	47	46	43	45
9/13/2009	10:30 AM	202	Michael Plotnik	110776	RMB Lab	13	6	8.5	41	48	46	45
Annual Mean						18.2	4.2	10.6	45	43	43	44

Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0171-02	Wabedo (SW Bay)	202 (Primary)	06-01-2008 - 09-30-2009	RMB Lab

Historical Mean						25.3	6.2	10.3	50	47	43	47
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.
6/9/2008	8:30 AM	202	Ronald Anderson	78456	RMB Lab	18	10	9	46	53	45	48
6/30/2008	8:00 AM	202	Ronald Anderson	80733	RMB Lab	22	6	11	49	48	43	47
7/27/2008	7:00 PM	202	Ronald Anderson	83604	RMB Lab	27	3	11	52	41	43	45
8/18/2008	8:30 AM	202	Ronald Anderson	85406	RMB Lab	32	6	9	54	48	45	49
9/7/2008	11:30 AM	202	Ronald Anderson	86954	RMB Lab	21	10	7	48	53	49	50
Annual Mean						24	7	9.4	49	48	45	47
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	10:10 AM	202	Ronald Anderson	98196	RMB Lab	49	6	8.5	60	48	46	51
6/22/2009	8:30 AM	202	Ronald Anderson	101096	RMB Lab	16	6	11	44	48	43	45
7/13/2009	8:45 AM	202	Ronald Anderson	103439	RMB Lab	20	4	13.5	47	44	40	44
8/9/2009	11:00 AM	202	Ronald Anderson	107095	RMB Lab	23	6	11	49	48	43	47
9/14/2009	9:30 AM	202	Ronald Anderson	110809	RMB Lab	25	5	12	51	46	41	46
Annual Mean						26.6	5.4	11.2	50	46	42	46