

Leech (Main Basin) 11-0203-01

MN Lake ID: 11-0203-01
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: Upper Mississippi River
 Latitude/Longitude: 47.16666667 / -94.39194444
 Water Body Type: Public Waters
 Monitored Sites (Primary): 210
 Monitored Sites (Secondary): 100, 101, 102, 103, 104, 105, 202, 203, 204, 205, 206, 207, 208, 209

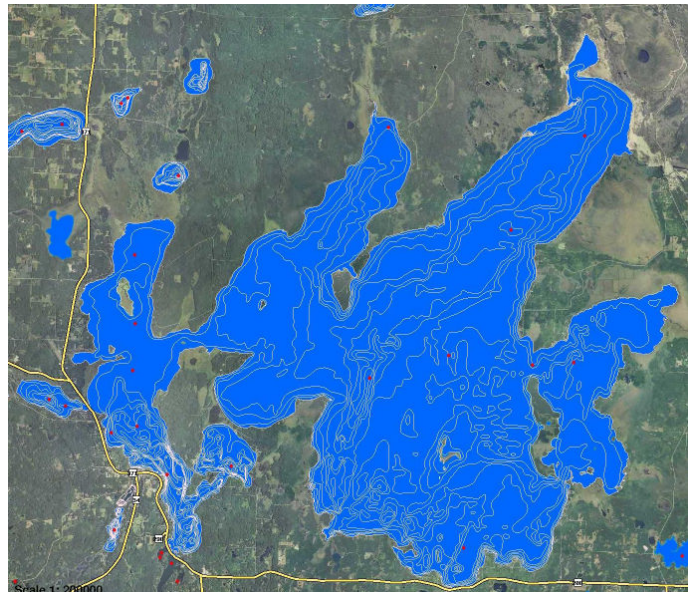
Physical Characteristics

Surface area (acres): 102947
 Littoral area (acres): 57994
 % Littoral area: 56%
 Max depth (ft): 150 (m): 45.7
 Mean depth (ft): N/A (m): N/A
 Watershed size (acres): N/A

Water Quality Characteristics - Historical Means

Years monitored: 1990-2003, 2005-2009

Parameters	Site 204
Total Phosphorus Mean:	15.1
Total Phosphorus Min:	4
Total Phosphorus Max:	25
Number of Observations:	8
Chlorophyll-a Mean:	2.4
Chlorophyll-a Min:	1
Chlorophyll-a Max:	4
Number of Observations:	9
Secchi Depth Mean:	14.4
Secchi Depth Min:	10.5
Secchi Depth Max:	21
Number of Observations:	8
Trophic State Index Mean:	39
Trophic State:	Oligotrophic



Ecoregion Comparisons

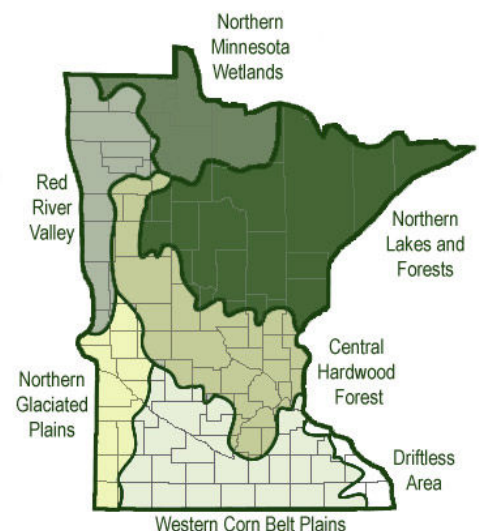
Minnesota is divided into 7 ecoregions based on land use, vegetation, precipitation and geology. The MPCA has developed a way to determine the "average range" of water quality expected for lakes in each ecoregion.

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.

Leech Lake – Agency Bay (Site 204) compares to the ecoregion average ranges as indicated below:

Total Phosphorus:	Within expected range, which indicates 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, chlorophyll *a*, or Secchi depth on Leech Lake – Agency Bay (Site 204).

Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0203-01	Leech (Main Basin)	204	06-01-2008 - 09-30-2009	RMB Lab

Historical Mean						15.1	2.4	14.4	40	37	38	39
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	12:55 PM	204	Dennis Leff	78399	RMB Lab	19	2	12	47	37	41	42
6/29/2008	11:30 AM	204	Dennis Leff	80703	RMB Lab	13	1	21	41	31	33	35
8/17/2008	6:45 PM	204	Dennis Leff	85376	RMB Lab	17	4	10.5	45	44	43	44
Annual Mean						16.3	2.3	14.5	44	37	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	10:15 AM	204	Dennis Leff	98186	RMB Lab	< 5	3	12	17	41	41	33
6/21/2009	2:30 PM	204	Dennis Leff	101128	RMB Lab	10	1	17	37	31	36	35
7/12/2009	2:30 PM	204	Dennis Leff	103759	RMB Lab	12	1	18	40	31	35	35
8/8/2009	4:45 PM	204	Dennis Leff	107098	RMB Lab	25	3	13	51	41	40	44
9/13/2009	11:10 AM	204	Dennis Leff	110788	RMB Lab	21	4	12	48	44	41	44
Annual Mean						14.4	2.4	14.4	38	37	38	38