

# Broadwater Bay 11-0201-01

MN Lake ID: 11-0201-01  
 County: Cass  
 Ecoregion: Northern Lakes and Forests  
 Major Drainage Basin: Upper Mississippi River  
 Latitude/Longitude: N/A  
 Water Body Type: Public Waters  
 Monitored Sites (Primary): 102  
 Monitored Sites (Secondary): N/A

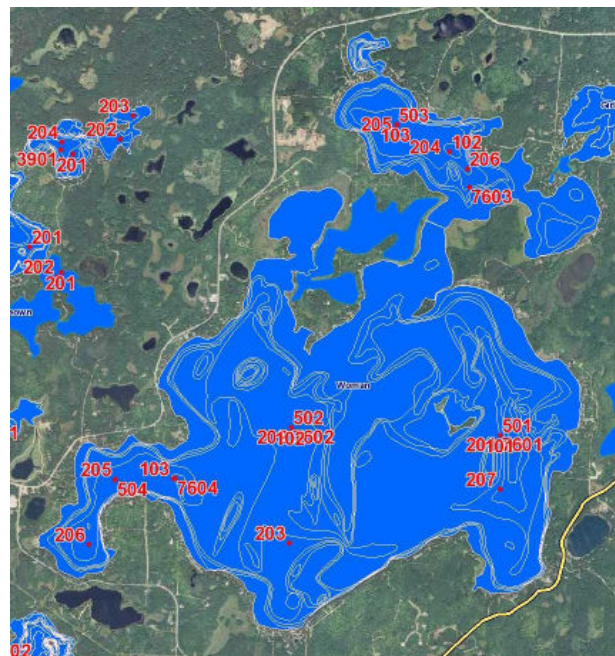
## Physical Characteristics

Surface area (acres): 714  
 Littoral area (acres): N/A  
 % Littoral area: N/A  
 Max depth (ft): 47 (m): 14.3  
 Mean depth (ft): N/A (m): N/A  
 Watershed size (acres): N/A

## Water Quality Characteristics - Historical Means

Years monitored: 2008-2009

Parameters	Primary Site 102
<b>Total Phosphorus Mean:</b>	13.4
<b>Total Phosphorus Min:</b>	11
<b>Total Phosphorus Max:</b>	19
<b>Number of Observations:</b>	9
<b>Chlorophyll-a Mean:</b>	4.9
<b>Chlorophyll-a Min:</b>	2
<b>Chlorophyll-a Max:</b>	11
<b>Number of Observations:</b>	9
<b>Secchi Depth Mean:</b>	14.1
<b>Secchi Depth Min:</b>	11.5
<b>Secchi Depth Max:</b>	19
<b>Number of Observations:</b>	7
<b>Trophic State Index Mean (Primary Site):</b>	42.1
<b>Trophic State:</b>	Mesotrophic



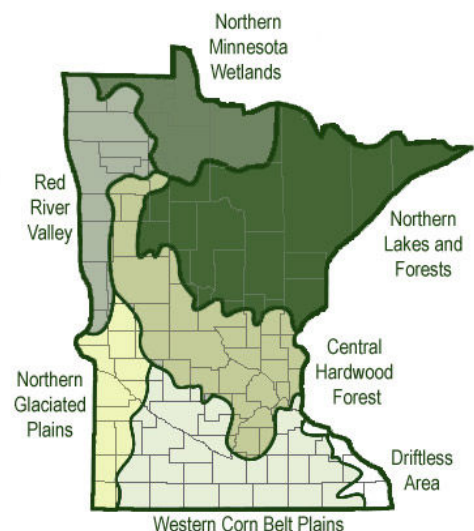
## Ecoregion Comparisons

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 25<sup>th</sup> - 75<sup>th</sup> percentile range for data within each ecoregion.

Cass County is in the Northern Lakes and Forests Ecoregion.

**Broadwater Bay** 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:	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, chlorophyll *a*, or Secchi depth on Broadwater Bay, Site 201.

### Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0201-01	Broadwater Bay	102 (Primary)	06-01-2008 - 08-31-2009	RMB Lab

Historical Mean						13.4	4.9	14.1	41	44	39	42
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.
<a href="#">6/15/2008</a>	1:45 PM	102	Keith Lorensen	79368	RMB Lab	16	3	12	44	41	41	42
<a href="#">6/29/2008</a>	10:00 AM	102	Keith Lorensen	80730	RMB Lab	14	6	15.5	42	48	38	43
<a href="#">7/27/2008</a>	2:30 PM	102	Keith Lorensen	83598	RMB Lab	11	2	N/A	39	37	N/A	38
<a href="#">8/17/2008</a>	2:30 PM	102	Keith Lorensen	85411	RMB Lab	12	7	11.5	40	50	42	44
<a href="#">9/8/2008</a>	9:00 AM	102	Keith Lorensen	86956	RMB Lab	14	6	12	42	48	41	44
Annual Mean						13.4	4.8	12.8	41	44	40	42
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.
<a href="#">6/1/2009</a>	8:15 AM	102	Keith Lorensen	98227	RMB Lab	11	3	19	39	41	35	38
<a href="#">6/22/2009</a>	8:49 AM	102	Keith Lorensen	101099	RMB Lab	12	3	14	40	41	39	40
<a href="#">7/12/2009</a>	2:45 PM	102	Keith Lorensen	103463	RMB Lab	12	3	15	40	41	38	40
<a href="#">8/9/2009</a>	3:00 PM	102	Keith Lorensen	107093	RMB Lab	19	11	N/A	47	54	N/A	50
Annual Mean						13.5	5	16	41	44	37	42

Report prepared by RMB Environmental Laboratories, Inc.  
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