

# Little Boy 11-0167-00

MN Lake ID: 11-0167-00  
 County: Cass  
 Ecoregion: Northern Lakes and Forests  
 Major Drainage Basin: Upper Mississippi River  
 Latitude/Longitude: 46.94527778 / -94.18858333  
 Water Body Type: Public Waters  
 Monitored Sites (Primary): 201  
 Monitored Sites (Secondary): N/A

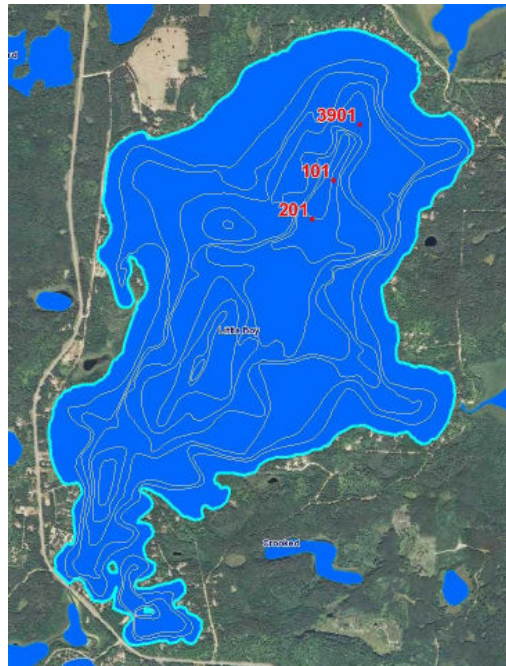
## Physical Characteristics

Surface area (acres): 1372  
 Littoral area (acres): 466  
 % Littoral area: 33%  
 Max depth (ft): 74 (m): 22.6  
 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 201
<b>Total Phosphorus Mean:</b>	17.5
<b>Total Phosphorus Min:</b>	9
<b>Total Phosphorus Max:</b>	28
<b>Number of Observations:</b>	13
<b>Chlorophyll-a Mean:</b>	6.9
<b>Chlorophyll-a Min:</b>	3
<b>Chlorophyll-a Max:</b>	28
<b>Number of Observations:</b>	13
<b>Secchi Depth Mean:</b>	11.4
<b>Secchi Depth Min:</b>	7.1
<b>Secchi Depth Max:</b>	17
<b>Number of Observations:</b>	13
<b>Trophic State Index Mean:</b>	44.8
<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.

**Little Boy Lake (Site 201)** 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



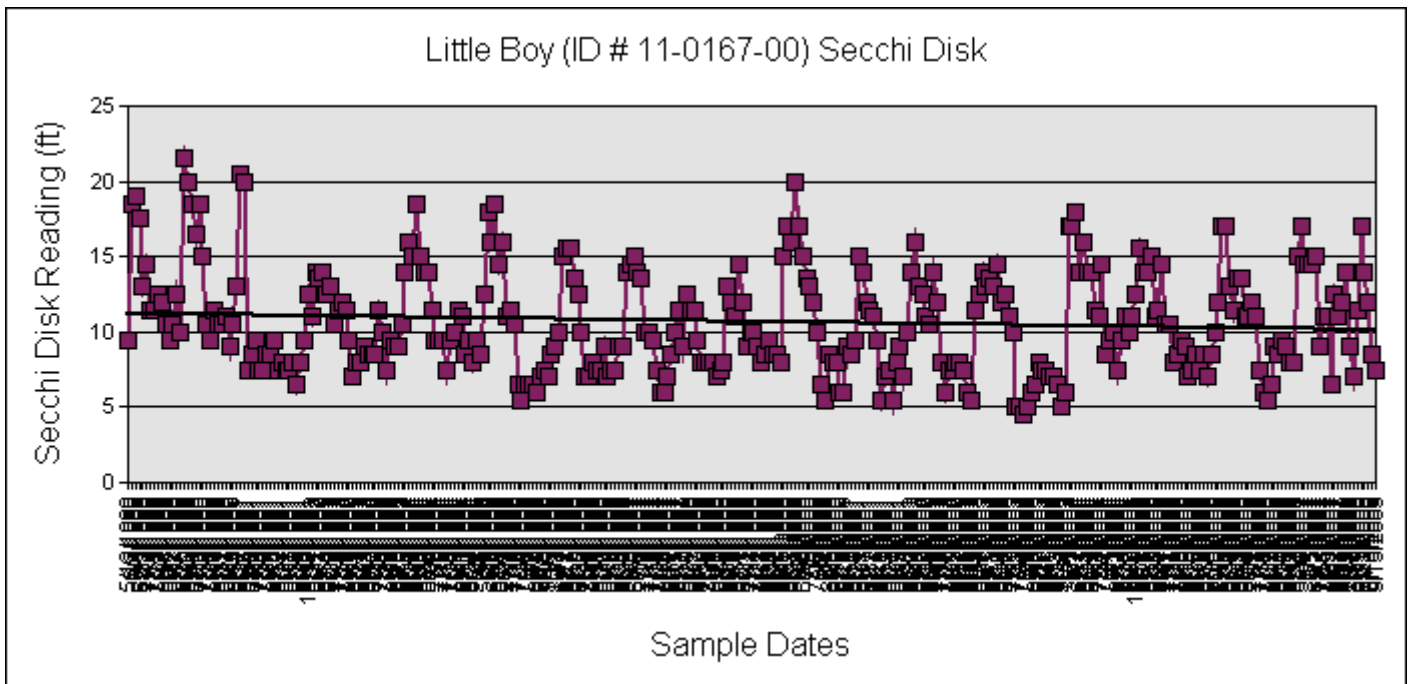
# Trend Analysis Report

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 Little Boy Lake. Site 201 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	11-0167-00	Little Boy	201 (Primary)	Secchi Disk	05-01-1989 - 09-30-2009	All Historical

**The probability that a true significant trend exists is 80%  
Secchi Disk is decreasing, which indicates declining water quality.**



## Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0167-00	Little Boy	201 (Primary)	06-01-2007 - 09-30-2009	RMB Lab

Historical Mean						17.5	6.9	11.4	44	47	42	44
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.
<a href="#">6/4/2007</a>	11:00 AM	201	DJ Wenzel	62143	RMB Lab	13	5	14.5	41	46	39	42
<a href="#">7/16/2007</a>	10:00 AM	201	DJ Wenzel	65135	RMB Lab	18	7	11	46	50	43	46
<a href="#">7/23/2007</a>	1:00 PM	201	DJ Wenzel	65515	RMB Lab	17	5	11	45	46	43	45
<a href="#">8/23/2007</a>	8:30 AM	201	DJ Wenzel	67294	RMB Lab	21	6	11	48	48	43	46
Annual Mean						17.2	5.8	11.9	45	47	42	44
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.
<a href="#">6/29/2008</a>	10:30 AM	201	DJ Wenzel	80752	RMB Lab	9	4	14	36	44	39	40
<a href="#">7/27/2008</a>	11:00 AM	201	DJ Wenzel	83592	RMB Lab	15	3	9	43	41	45	43
<a href="#">8/17/2008</a>	11:00 AM	201	Russell Link	85412	RMB Lab	15	4	7.11	43	44	49	45
<a href="#">9/9/2008</a>	8:00 AM	201	Russell Link	87175	RMB Lab	18	8	11.5	46	51	42	46
Annual Mean						14.2	4.8	10.4	42	45	43	43
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.
<a href="#">5/31/2009</a>	8:25 AM	201	Russel Link and Matt Spanier	98200	RMB Lab	16	3	17	44	41	36	40
<a href="#">6/22/2009</a>	11:00 AM	201	Russell Link	101113	RMB Lab	16	3	14	44	41	39	41
<a href="#">7/13/2009</a>	9:43 AM	201	Russell Link	103459	RMB Lab	23	6	12	49	48	41	46
<a href="#">8/10/2009</a>	9:15 AM	201	Russell Link	107090	RMB Lab	19	8	8.5	47	51	46	48
<a href="#">9/13/2009</a>	7:00 PM	201	Russell Link	110807	RMB Lab	28	28	7.5	52	63	48	54
Annual Mean						20.4	9.6	11.8	47	48	42	45