

# Trillium 11-0270-00

MN Lake ID: 11-0270-00  
 County: Cass  
 Ecoregion: Northern Lakes and Forests  
 Major Drainage Basin: Lower Mississippi River  
 Latitude/Longitude: 46.93277778 / -94.38861111  
 Water Body Type: Public Waters  
 Monitored Sites (Primary): 201  
 Monitored Sites (Secondary): 202, 3901

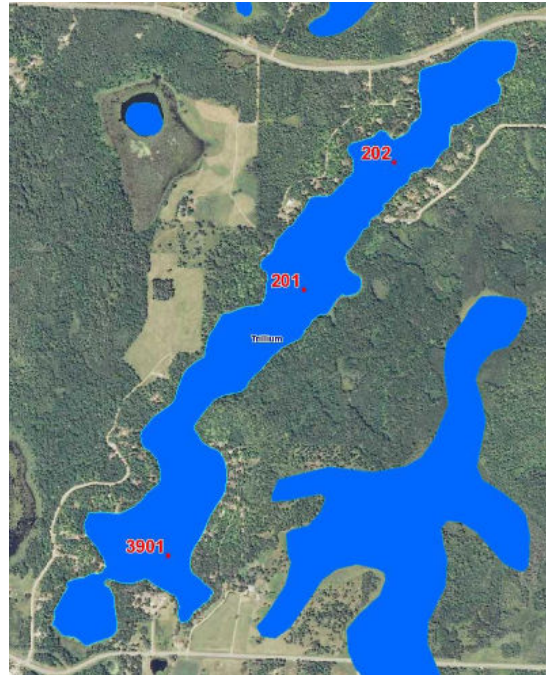
## Physical Characteristics

Surface area (acres): 136  
 Littoral area (acres): 91  
 % Littoral area: 66%  
 Max depth (ft): 48 (m): 14.6  
 Mean depth (ft): N/A (m): N/A  
 Watershed size (acres): N/A

## Water Quality Characteristics - Historical Means

Years monitored: 2006-2009

Parameters	Site 3901
<b>Total Phosphorus Mean:</b>	27.5
<b>Total Phosphorus Min:</b>	19
<b>Total Phosphorus Max:</b>	51
<b>Number of Observations:</b>	20
<b>Chlorophyll-a Mean:</b>	9.6
<b>Chlorophyll-a Min:</b>	2
<b>Chlorophyll-a Max:</b>	40
<b>Number of Observations:</b>	20
<b>Secchi Depth Mean:</b>	10
<b>Secchi Depth Min:</b>	5.5
<b>Secchi Depth Max:</b>	14.5
<b>Number of Observations:</b>	12
<b>Trophic State Index Mean (Primary Site):</b>	48
<b>Trophic State:</b>	Mesotrophic



## Ecoregion Comparisons

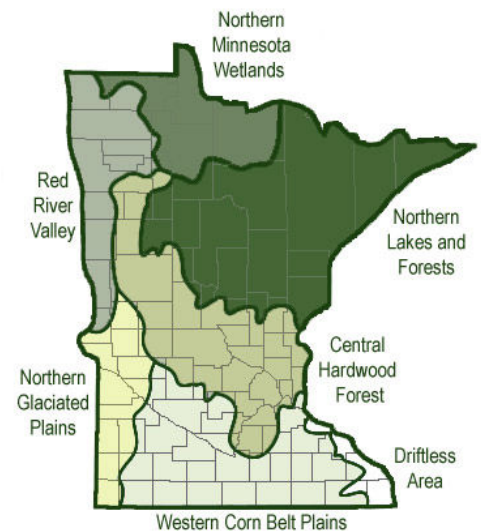
Minnesota is divided into 7 ecoregions based on land use, vegetation, precipitation and geology. The MPCA has developed a way to determine the "average range" of water quality expected for lakes in each ecoregion.

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.

**Trillium Lake (Site 3901)** 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



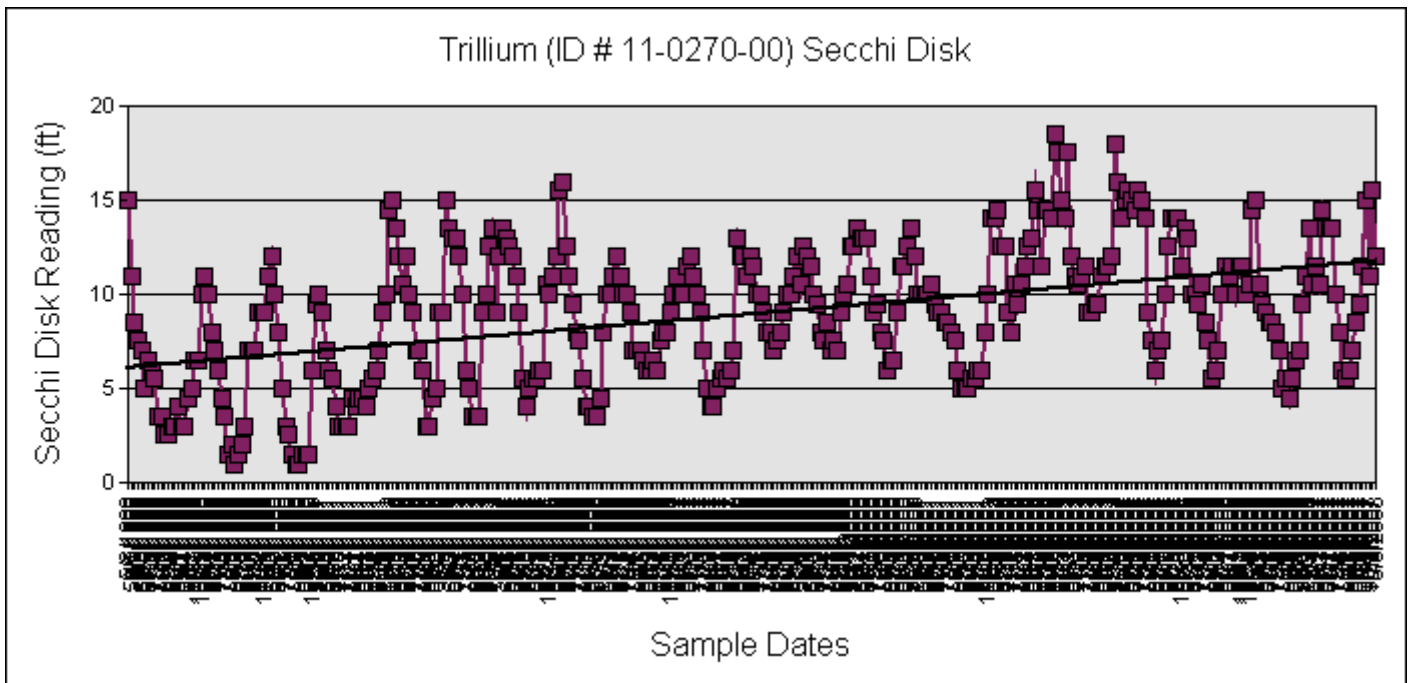
# Trend Analysis Report

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, chlorophyll *a*, or Secchi depth on Trillium Lake, Site 3901. However, 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	11-0270-00	Trillium	201 (Primary)	Secchi Disk	05-01-1988 - 06-30-2008	All Historical

**The probability that a true significant trend exists is 99.9%  
Secchi Disk is increasing, which indicates improving water quality.**



# Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0270-00	Trillium	3901	05-01-2006 - 09-30-2009	RMB Lab

<b>Historical Mean</b>	<b>27.5</b>	<b>9.6</b>	<b>10</b>	<b>51</b>	<b>48</b>	<b>44</b>	<b>48</b>
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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="#">5/29/2006</a>	12:00 AM	3901	Bill Temple	NA	RMB Lab	40	40	14.5	57	67	39	54
<a href="#">6/25/2006</a>	12:00 AM	3901	Bill Temple	NA	RMB Lab	37	11	8.5	56	54	46	52
<a href="#">7/29/2006</a>	12:00 AM	3901	Bill Temple	NA	RMB Lab	32	6	5.5	54	48	53	52
<a href="#">9/1/2006</a>	12:00 AM	3901	Bill Temple	NA	RMB Lab	26	2	9.5	51	37	45	44
<a href="#">9/26/2006</a>	12:00 AM	3901	Bill Temple	NA	RMB Lab	51	5	11	61	46	43	50
<b>Annual Mean</b>						<b>37.2</b>	<b>12.8</b>	<b>9.8</b>	<b>55</b>	<b>50</b>	<b>45</b>	<b>50</b>

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="#">6/3/2007</a>	5:00 PM	3901	Bill Temple	62146	RMB Lab	20	4	12.5	47	44	41	44
<a href="#">6/18/2007</a>	1:00 PM	3901	Bill Temple	63192	RMB Lab	19	2	12	47	37	41	42
<a href="#">7/15/2007</a>	3:30 PM	3901	Bill Temple	65188	RMB Lab	28	15	6	52	57	51	53
<a href="#">8/19/2007</a>	11:30 AM	3901	Bill Temple	67005	RMB Lab	27	11	8	52	54	47	51
<a href="#">9/15/2007</a>	6:00 PM	3901	Bill Temple	68587	RMB Lab	21	5	13	48	46	40	45
<b>Annual Mean</b>						<b>23</b>	<b>7.4</b>	<b>10.3</b>	<b>49</b>	<b>47</b>	<b>44</b>	<b>47</b>

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="#">6/8/2008</a>	10:40 AM	3901	Jim Jacobsen	78401	RMB Lab	27	2	10	52	37	44	44
<a href="#">6/29/2008</a>	7:10 PM	3901	Jacobson/Ferrell/Andrews	80697	RMB Lab	23	4	N/A	49	44	N/A	46
<a href="#">7/27/2008</a>	6:45 PM	3901	Jim Jacobsen	83546	RMB Lab	26	7	N/A	51	50	N/A	50
<a href="#">8/17/2008</a>	7:00 PM	3901	Jacobson/Ferrell/Temple	85396	RMB Lab	29	28	N/A	53	63	N/A	58
<a href="#">9/8/2008</a>	6:00 PM	3901	Jacobson/Ferrell	86971	RMB Lab	27	11	9	52	54	45	50
<b>Annual Mean</b>						<b>26.4</b>	<b>10.4</b>	<b>9.5</b>	<b>51</b>	<b>49</b>	<b>44</b>	<b>49</b>

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="#">6/21/2009</a>	3:15 PM	3901	Jim Jacobsen	101077	RMB Lab	19	3	N/A	47	41	N/A	44
<a href="#">7/5/2009</a>	5:10 PM	3901	Jim Jacobsen	102680	RMB Lab	19	4	N/A	47	44	N/A	46
<a href="#">7/12/2009</a>	6:15 PM	3901	Jim Jacobsen	103477	RMB Lab	25	4	N/A	51	44	N/A	48
<a href="#">8/9/2009</a>	6:45 PM	3901	Jim Jacobsen	107132	RMB Lab	27	21	N/A	52	60	N/A	56
<a href="#">9/13/2009</a>	6:00 PM	3901	Temple/Ferrell	110782	RMB Lab	28	6	N/A	52	48	N/A	50
<b>Annual Mean</b>						<b>23.6</b>	<b>7.6</b>	<b>N/A</b>	<b>49</b>	<b>47</b>	<b>N/A</b>	<b>48</b>

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