

# Surprise 11-0375-00

MN Lake ID: 11-0375-00  
 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): 201  
 Monitored Sites (Secondary): N/A

## Physical Characteristics

Surface area (acres): N/A  
 Littoral area (acres): N/A  
 % Littoral area: N/A  
 Max depth (ft): N/A (m): N/A  
 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 201
<b>Total Phosphorus Mean:</b>	22.7
<b>Total Phosphorus Min:</b>	18
<b>Total Phosphorus Max:</b>	31
<b>Number of Observations:</b>	10
<b>Chlorophyll-a Mean:</b>	5.7
<b>Chlorophyll-a Min:</b>	1
<b>Chlorophyll-a Max:</b>	16
<b>Number of Observations:</b>	10
<b>Secchi Depth Mean:</b>	8.8
<b>Secchi Depth Min:</b>	6.5
<b>Secchi Depth Max:</b>	12.5
<b>Number of Observations:</b>	10
<b>Trophic State Index Mean:</b>	46.3
<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.

**Surprise Lake** 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 Surprise Lake.

### Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0375-00	Surprise	201 (Primary)	06-01-2008 - 09-30-2009	RMB Lab

Historical Mean						22.7	5.7	8.8	49	44	46	46
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="#">6/8/2008</a>	12:30 PM	201	Ray Payne	78415	RMB Lab	31	5	7.5	54	46	48	49
<a href="#">6/29/2008</a>	12:30 PM	201	Ray Payne	80727	RMB Lab	21	6	7.5	48	48	48	48
<a href="#">7/27/2008</a>	12:55 PM	201	Don Borgen - WLA	83564	RMB Lab	18	1	8	46	31	47	41
<a href="#">8/17/2008</a>	1:15 PM	201	Ray Payne	85386	RMB Lab	24	5	6.5	50	46	50	49
<a href="#">9/7/2008</a>	1:30 PM	201	Ray Payne	86943	RMB Lab	25	16	9	51	58	45	51
Annual Mean						23.8	6.6	7.7	49	45	47	47
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="#">5/31/2009</a>	1:35 PM	201	Don Borgen - WLA	98177	RMB Lab	23	2	12	49	37	41	42
<a href="#">6/21/2009</a>	2:00 PM	201	Ray Payne	101435	RMB Lab	18	1	12.5	46	31	41	39
<a href="#">7/13/2009</a>	9:45 AM	201	Ray Payne	103464	RMB Lab	19	3	11	47	41	43	44
<a href="#">8/9/2009</a>	1:00 PM	201	Ray Payne	107126	RMB Lab	25	6	7.5	51	48	48	49
<a href="#">9/13/2009</a>	3:00 PM	201	Ray Payne	110813	RMB Lab	23	12	6.5	49	55	50	51
Annual Mean						21.6	4.8	9.9	48	42	44	45