

Stony 11-0371-00

MN Lake ID: 11-0371-00
 County: Cass
 Ecoregion: Northern Lakes and Forests
 Major Drainage Basin: N/A
 Latitude/Longitude: N/A
 Water Body Type: N/A
 Monitored Sites (Primary): 201
 Monitored Sites (Secondary): N/A

Physical Characteristics

Surface area (acres): 576
 Littoral area (acres): 179
 % Littoral area: 31
 Max depth (ft): 50 (m): 15.3
 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
Total Phosphorus Mean:	10.8
Total Phosphorus Min:	6
Total Phosphorus Max:	20
Number of Observations:	15
Chlorophyll-a Mean:	2.5
Chlorophyll-a Min:	1
Chlorophyll-a Max:	4
Number of Observations:	15
Secchi Depth Mean:	20.2
Secchi Depth Min:	15.5
Secchi Depth Max:	25
Number of Observations:	13
Trophic State Index Mean:	37
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. **Stony Lake** 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:	Better than expected range, which indicates better than expected water quality for the area
Secchi Depth:	Better than expected range, which indicates better than expected water quality for the area

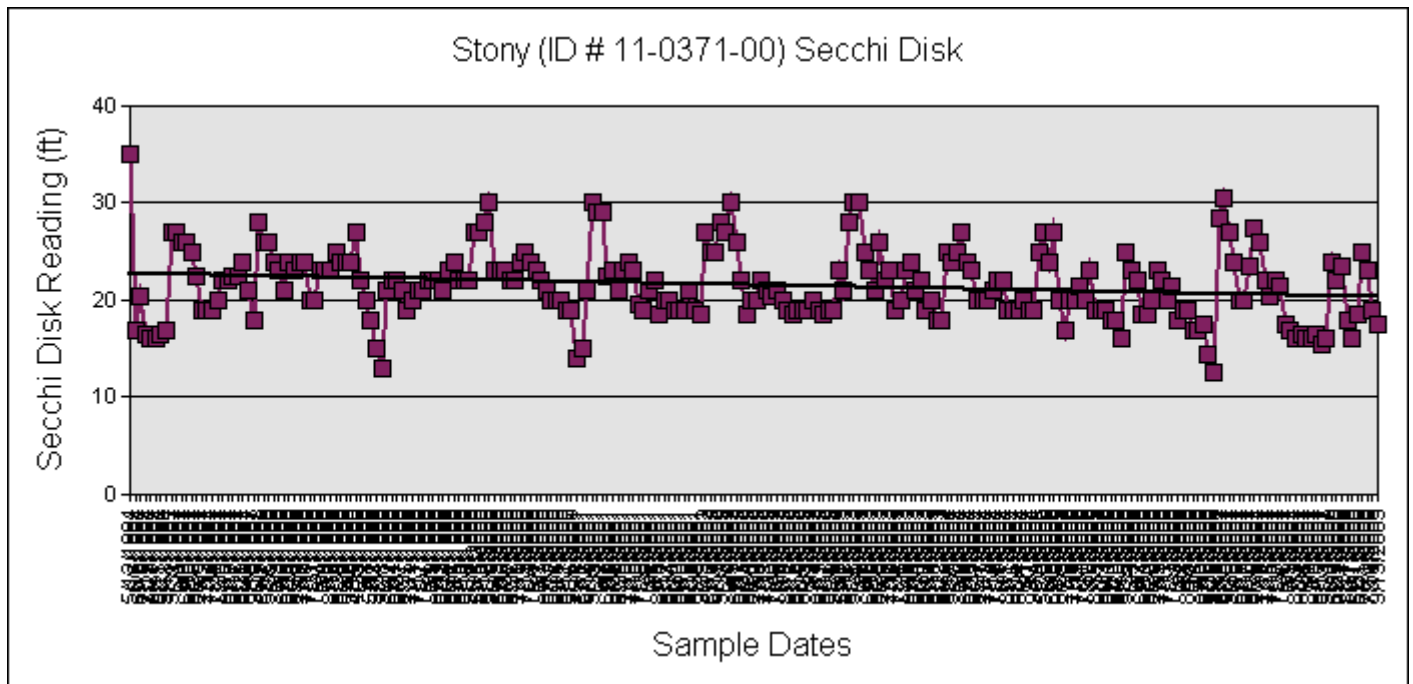
Trend Analysis Report

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 Stony 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	11-0371-00	Stony	201 (Primary)	Secchi Disk	05-01-1994 - 09-30-2009	All Historical

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



Individual Lake Data Summary

County	MN Lake ID	Lake	Site	Date Range	Data Source
Cass	11-0371-00	Stony	201 (Primary)	06-01-2007 - 09-30-2009	RMB Lab

Historical Mean						10.8	2.5	20.2	37	37	34	37
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.
6/7/2007	9:30 AM	201	Ron Wedin	62352	RMB Lab	20	3	N/A	47	41	N/A	44
6/17/2007	5:30 PM	201	Jerry Trout	63197	RMB Lab	10	1	20	37	31	34	34
7/15/2007	12:10 PM	201	Jerry Trout	65185	RMB Lab	11	1	20.5	39	31	34	35
8/19/2007	2:10 PM	201	Jerry Trout	67003	RMB Lab	9	4	N/A	36	44	N/A	40
9/19/2007	2:10 PM	201	Jerry Trout	68583	RMB Lab	15	4	15.5	43	44	38	42
Annual Mean						13	2.6	18.7	40	38	35	39
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.
6/9/2008	6:34 AM	201	Jerry Trout	78407	RMB Lab	12	1	24	40	31	31	34
6/29/2008	12:55 PM	201	Jerry Trout	80696	RMB Lab	8	3	22	34	41	33	36
7/27/2008	1:00 PM	201	Jerry Trout	83545	RMB Lab	7	1	23.5	32	31	32	32
8/17/2008	1:45 PM	201	Jerry Trout	85393	RMB Lab	8	4	18	34	44	35	38
9/7/2008	12:56 PM	201	Jerry Trout	86970	RMB Lab	8	1	16	34	31	37	34
Annual Mean						8.6	2	20.7	34	35	33	34
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.
5/31/2009	1:55 PM	201	Jerry Trout	98198	RMB Lab	17	4	18.5	45	44	35	41
6/21/2009	1:30 PM	201	Jerry Trout	101078	RMB Lab	11	2	25	39	37	31	36
7/12/2009	12:30 PM	201	Jerry Trout	103476	RMB Lab	6	2	23	30	37	32	33
8/9/2009	1:25 PM	201	Jerry Trout	107135	RMB Lab	10	4	19	37	44	35	39
9/13/2009	1:18 PM	201	Jerry Trout	110784	RMB Lab	10	2	17.5	37	37	36	37
Annual Mean						10.8	2.8	20.6	37	39	33	37