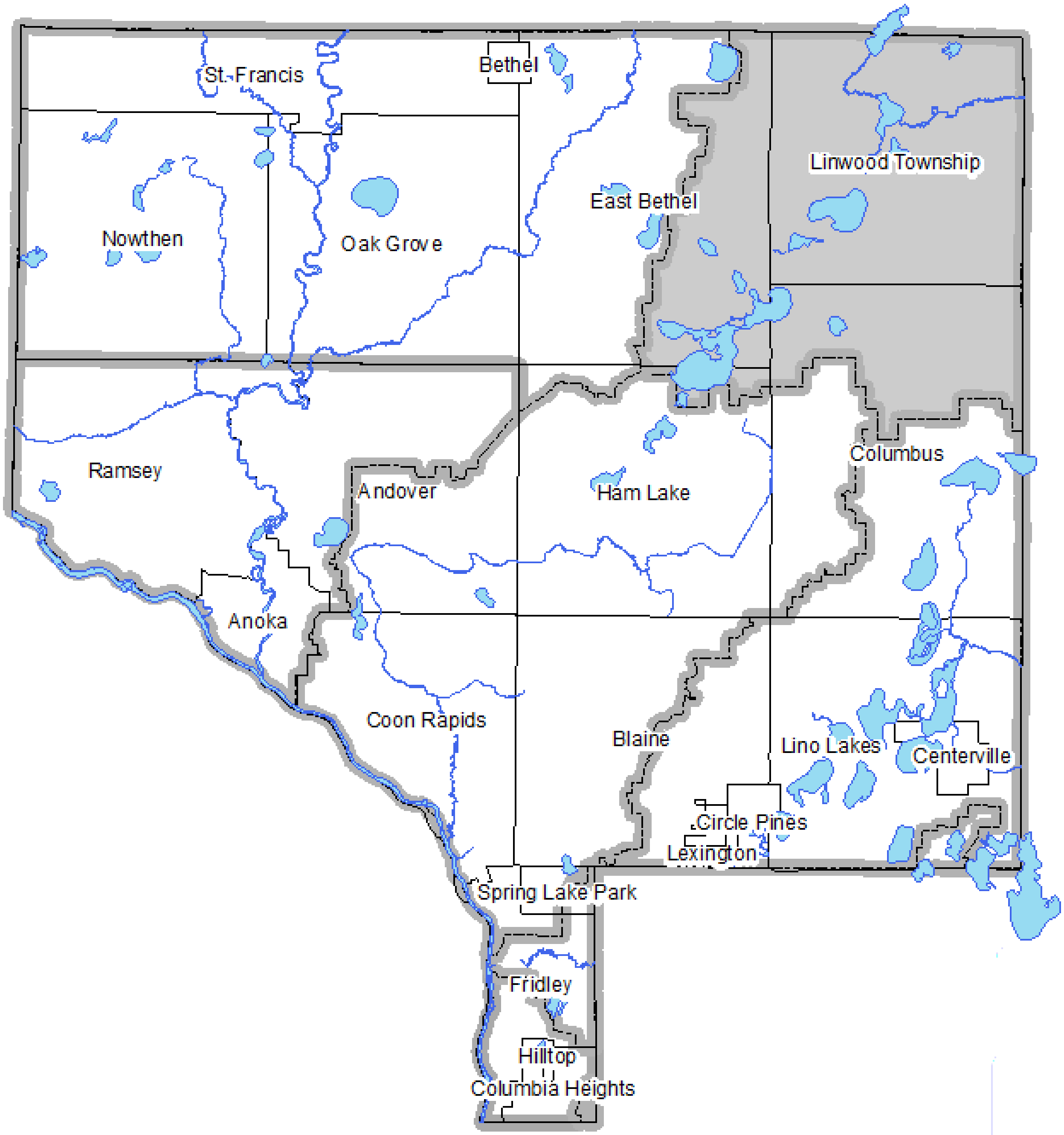
Excerpt from the
2020 Water Almanac

Chapter 2: Sunrise River Watershed



Prepared by the Anoka Conservation District

Chapter 2: Sunrise River Watershed

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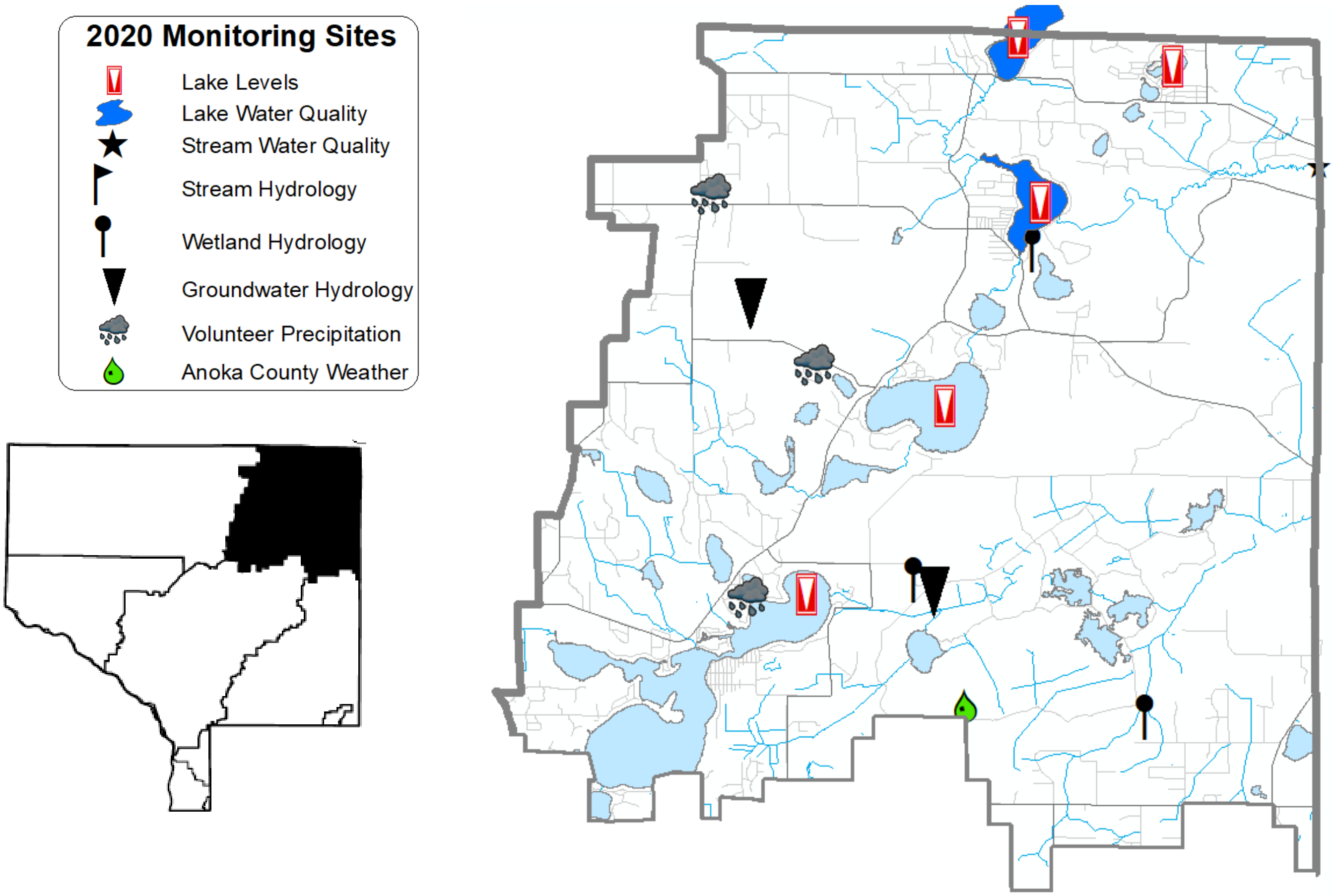
2020 Monitoring Sites
Lake Levels
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Lake Level Monitoring

Partners: SRWMO, ACD, MN DNR, local volunteers

Description: Weekly water level monitoring in lakes. The past five and twenty-five years of data for each lake are illustrated below, and all historical data are available on the Minnesota DNR website using the "LakeFinder" feature (www.dnr.mn.us.state\lakefind\index.html).

Purpose: To understand lake hydrology, including the impact of climate or other water budget changes. These data are useful for regulatory, building/development, and lake management decisions.

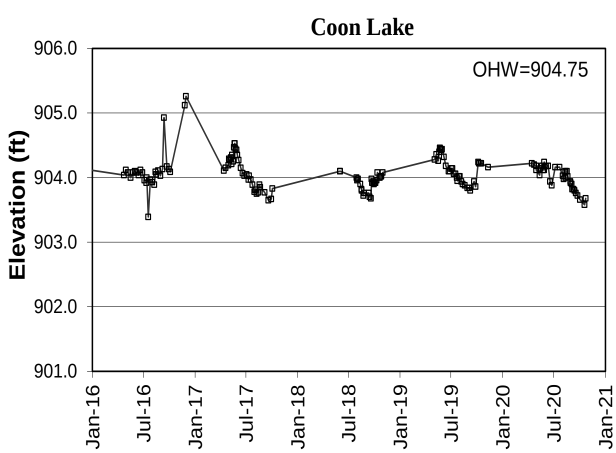
Locations: Coon, Fawn, Linwood, Martin, and Typo Lakes

Results: Lake gauges were installed by the Anoka Conservation District and surveyed by the MN DNR. In 2020, lake levels started near average and declined throughout the season. The rebound often seen in the fall was not overserved. This is likely due to infrequent rain events throughout the season and the lowest annual total precipitation since 2012. All lakes recorded lower water levels on average than in 2019, and Coon Lake had its lowest average level since 2015.

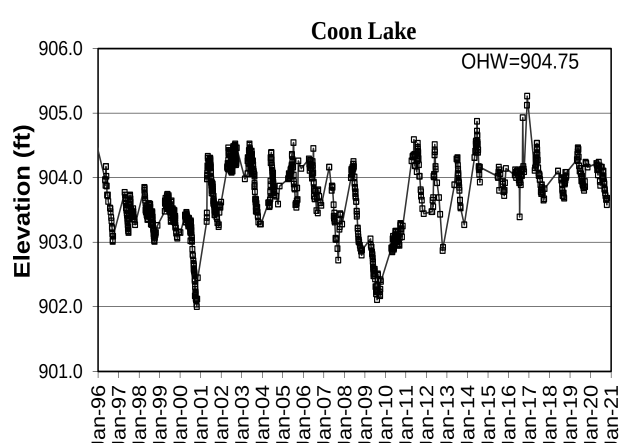
Lake levels fluctuated at a similar scale to previous years except for at Fawn Lake where levels fluctuated 1.33 ft. throughout the season. This was the largest range observed since 2014. The maximum elevation reached for the year (901.97) was the first seasonal reading taken for Fawn Lake in April, 2020 when lake levels were still elevated from the previous season. None of the lakes approached all-time highs or lows in 2020.

All lake level data can be downloaded from the MN DNR website's LakeFinder feature (https://www.dnr.state.mn.us/lakefind/index.html). Ordinary High Water Level (OHW), the elevation below which a DNR permit is needed to perform work, is listed for each lake on the corresponding graphs below.

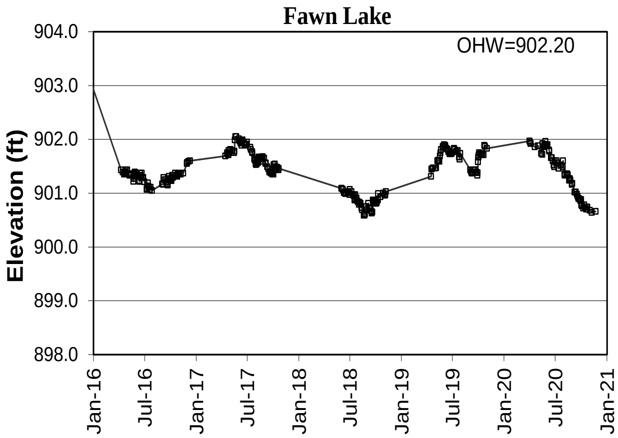
Coon Lake Levels – last 5 years



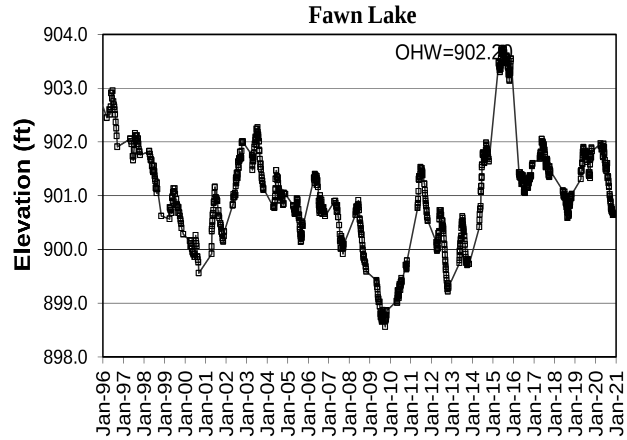
Coon Lake Levels – last 25 years



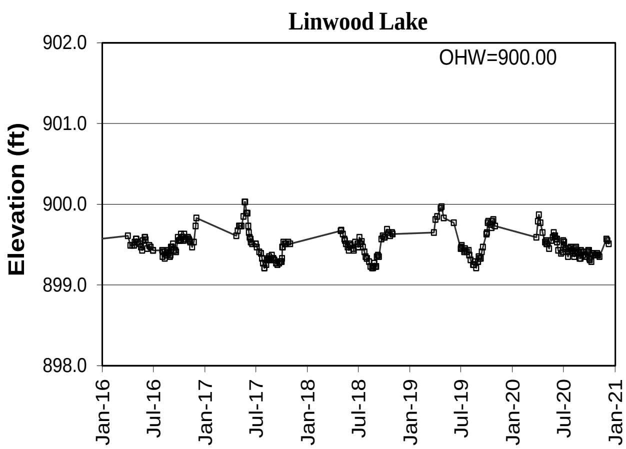
Fawn Lake Levels – last 5 years



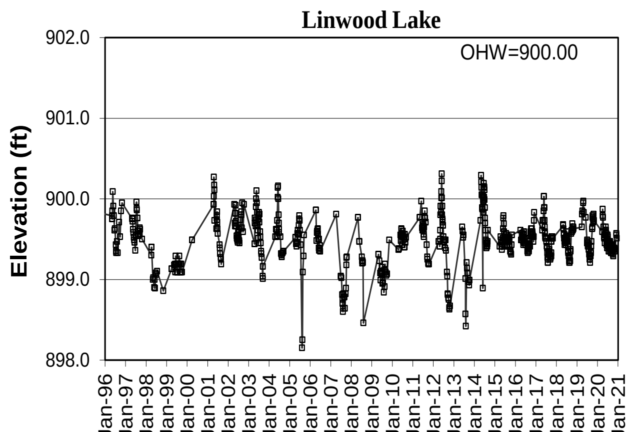
Fawn Lake Levels – last 25 years



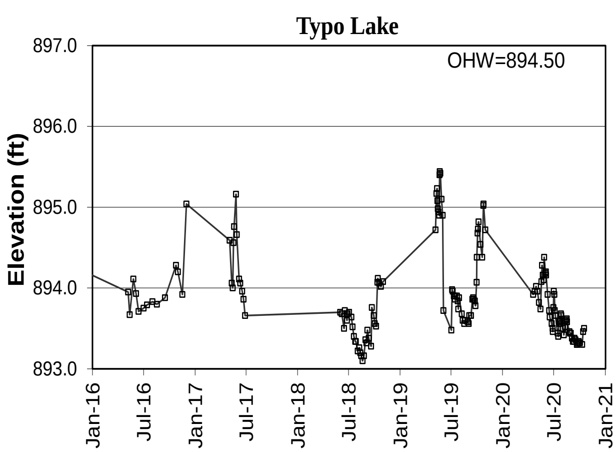
Linwood Lake Levels – last 5 years



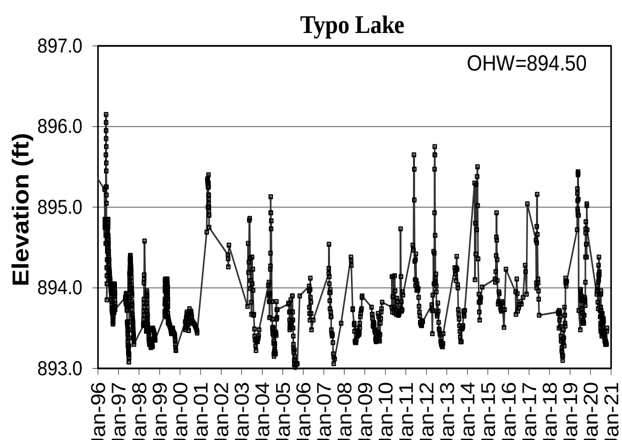
Linwood Lake Levels – last 25 years



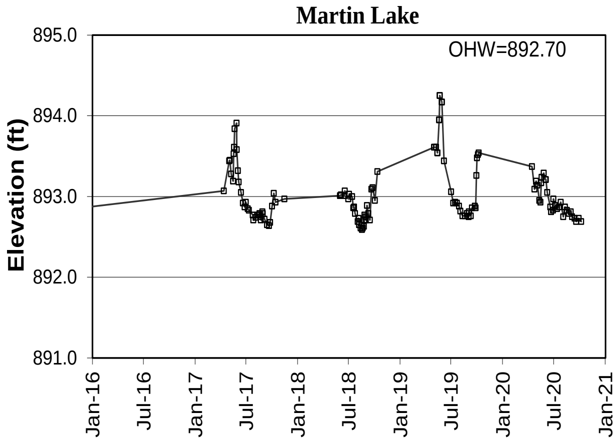
Typo Lake Levels – last 5 years



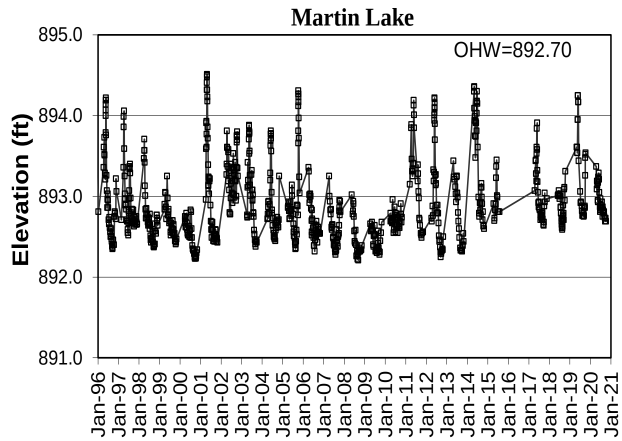
Typo Lake Levels – last 25 years



Martin Lake Levels – last 5 years



Martin Lake Levels – last 25 years



Lake	Year	Average	Min	Max
COON	2016	904.14	903.39	905.26
	2017	904.09	903.65	904.53
	2018	903.92	903.68	904.10
	2019	904.14	903.80	904.46
	2020	904.01	903.58	904.24

Lake	Year	Average	Min	Max
TYPO	2016	893.99	893.67	895.04
	2017	894.29	893.66	895.16
	2018	893.55	893.10	894.12
	2019	894.30	893.48	895.44
	2020	893.66	893.30	894.38

Lake	Year	Average	Min	Max
FAWN	2016	901.30	901.05	901.60
	2017	901.68	901.35	902.05
	2018	900.87	900.59	901.09
	2019	901.64	901.31	901.90
	2020	901.35	900.64	901.97

Lake	Year	Average	Min	Max
MARTIN	2015	892.96	892.70	893.45
	2017	893.03	892.64	893.91
	2018	892.85	892.59	893.31
	2019	893.32	892.75	894.25
	2020	892.95	892.69	893.37

Lake	Year	Average	Min	Max
LINWOOD	2016	899.51	899.33	899.83
	2017	899.49	899.21	900.03
	2018	899.46	899.21	899.69
	2019	899.54	899.21	899.97
	2020	899.47	899.29	899.87

Lake Water Quality

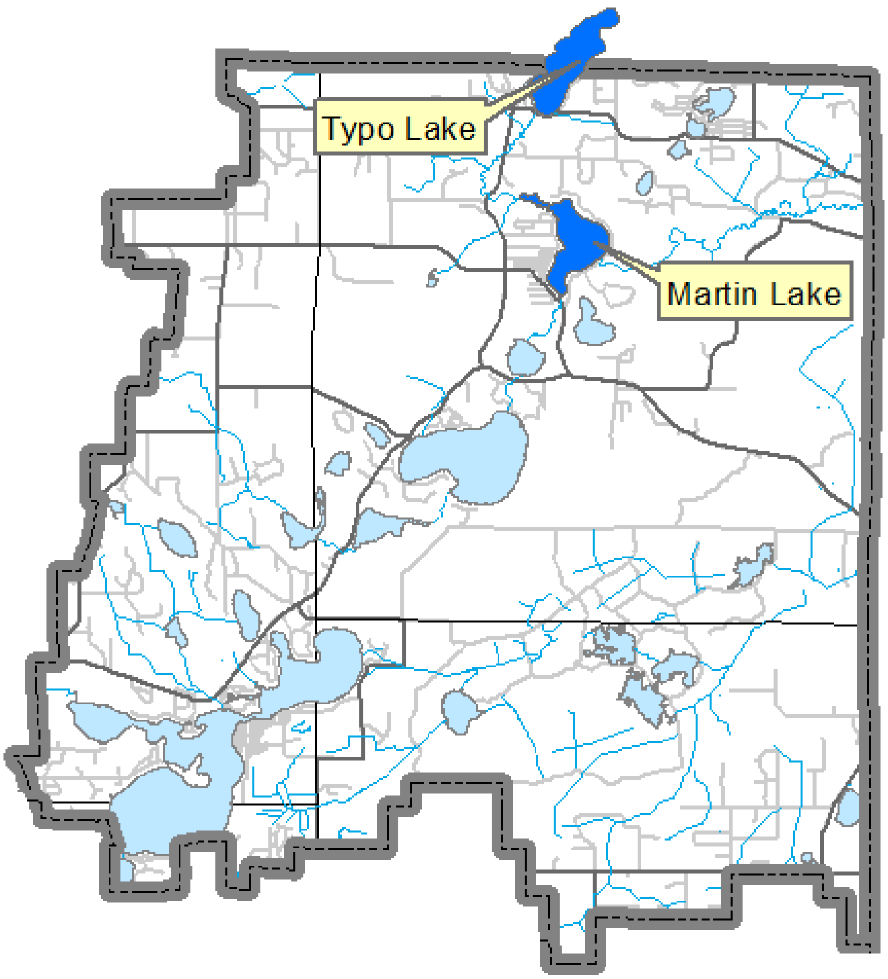
Description: May through September, every-other-week, monitoring is conducted for the following parameters: total phosphorus, chlorophyll-a, Secchi transparency, dissolved oxygen, turbidity, temperature, specific conductivity, pH, and salinity.

Purpose: To detect water quality trends and diagnose the cause of changes.

Locations: Typo, and Martin Lakes

Results: Detailed data for each lake are provided on the following pages, including summaries of historical conditions and trend analysis. Previous years' data are available from the Minnesota Pollution Control Agency (MPCA) (https://cf.pca.state.mn.us/water/watershedweb/wdip/search_more.cfm) or from ACD. Refer to Chapter 1 for additional information on lake dynamics and interpreting the data.

2020 Sunrise River Watershed Lake Water Quality Monitoring Sites



TYPO LAKE

LINWOOD TOWNSHIP, LAKE ID # 30-0009

Background

Typo Lake is located in northeast Anoka County and southeast Isanti County. It has a surface area of 290 acres and maximum depth of 6 feet (1.82 m), though most of the lake is about 3 feet deep. The lake has a mucky, loose, and unconsolidated bottom in some areas, while other areas have a sandy bottom. The public access is located at the south end of the lake along Fawn Lake Drive. The lake is used little for fishing or recreational boating because of the shallow depth and extremely poor water quality. The lake's shoreline is mostly undeveloped, with only 21 homes within 300 feet of the lakeshore. The lake's watershed of 11,520 acres is 3% residential, 33% agricultural, and 28% wetlands, with the remainder being forested or grassland. Typo Lake is on the MPCA's list of impaired waters for excess nutrients.

2020 Results

In 2020 Typo Lake had poor water quality compared to other lakes in this region (NCHF Ecoregion), receiving an overall F letter grade. Average total phosphorus (TP) was 220.0 µg/L, which was an increase from the 2019 average of 175.0 µg/L and the highest recorded average since 2009. While total phosphorus levels continue to far exceed the 60 µg/L state standard, average concentrations appear to be staying well below averages from a decade ago (353.0 µg/L in 2009).

Chlorophyll-a (Cl-a) levels in 2020 averaged 73.5 µg/L. This is similar to 2019 and other previous years. It is below the historical average for the lake of 110.3 µg/L but still many times higher than the State standard for Cl-a in shallow lakes of 20 µg/L.

Average Secchi transparency in 2020 was 1.3 feet, which is the third-highest average on record. In 2007 and 2009 a Secchi disk could be seen only 5-6 inches below the surface, on average. Transparency has improved throughout the last decade, but still remains poorer than the state standard for shallow lakes transparency of 1 meter (3.3 feet).

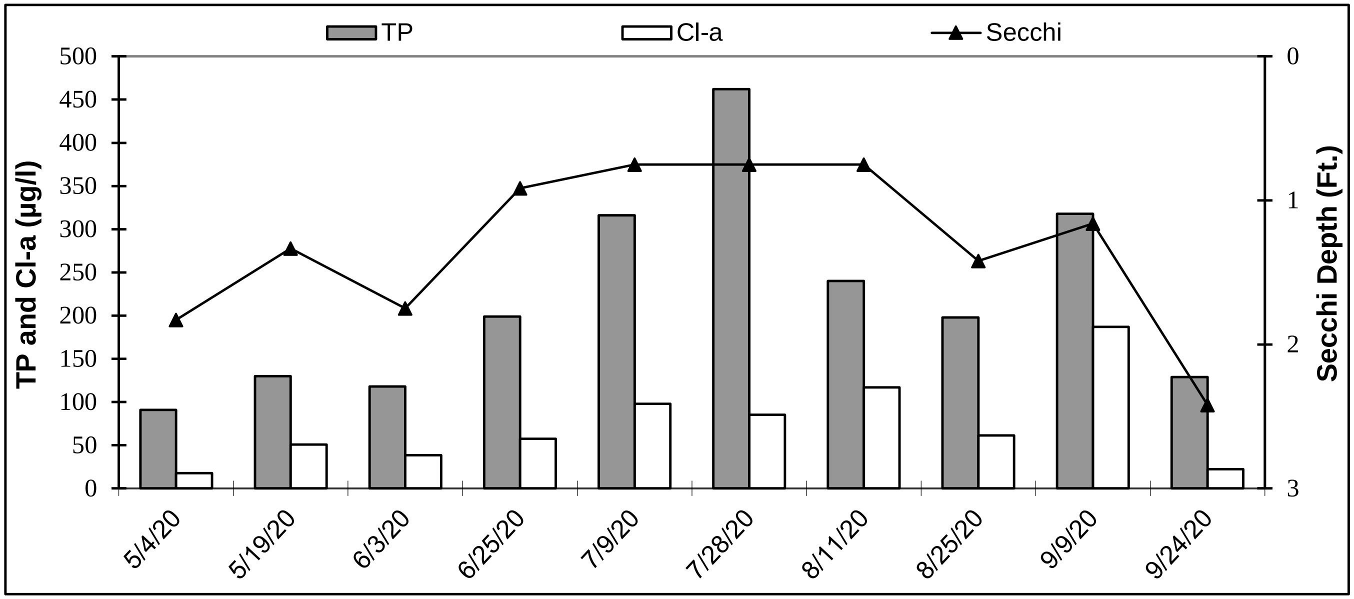
Trend Analysis

Twenty years of water quality monitoring have been conducted by the MPCA (1993, '94, and '95) and the Anoka Conservation District (1997-2001, '03, '05, '07, '09, '12, 2014-2020). Overall, water quality has improved from 1993 to 2020 (excluding high nutrient outlier years 2007 and 2009) in a statistically significant way (repeated measures MANOVA with response variables TP, Cl-a, and Secchi depth; $F_{2, 15}=8.87$, $p<0.01$). When we tested these response variables individually with one-way ANOVAs, TP and Secchi depth still show no significant change across this time period. Cl-a, however, is showing a statistically significant decline ($p<0.001$). A superficial look at graphs of these parameters suggests that total phosphorus is generally stable between 150 µg/L and 250 µg/L without a long-term trend. Secchi transparency in recent years is similar to averages from the early 1990s, an improvement from the late 1990s-2010. Transparency in the lake seems to be improving, though at this point is not statistically significant. The major driver of improved water quality is decreasing Cl-a concentrations.

Discussion

Typo Lake, along with Martin Lake downstream was the subject of a Total Maximum Daily Load (TMDL) study by the Anoka Conservation District, which was approved by the State and EPA in 2012. This study documented the sources of nutrients to the lake, the degree to which each is impacting the lake, and put forth lake rehabilitation strategies. Some factors impacting water quality in Typo Lake include rough fish, ditched wetland west of the lake, and lake sediments. Recent work has included installation of carp barriers (completed in 2016), carp removals (2017-2019, to be continued through 2022), and a feasibility study of ditched wetland restorations upstream of Typo Lake (2018). The feasibility study identified 4 potential projects along Ditch 20 upstream of Type Lake. It also recommends that dredging of Ditch 20 not occur. Current shoreline conditions on Typo Lake were inventoried during a 2019/2020 shoreline survey. This inventory will assist in identifying future lakeshore projects. Recent water quality monitoring results suggest these management approaches are improving conditions in these lakes, but reaching goals will require additional effort and time.

TYPO LAKE
LINWOOD TOWNSHIP, LAKE ID # 30-0009
2020 Results



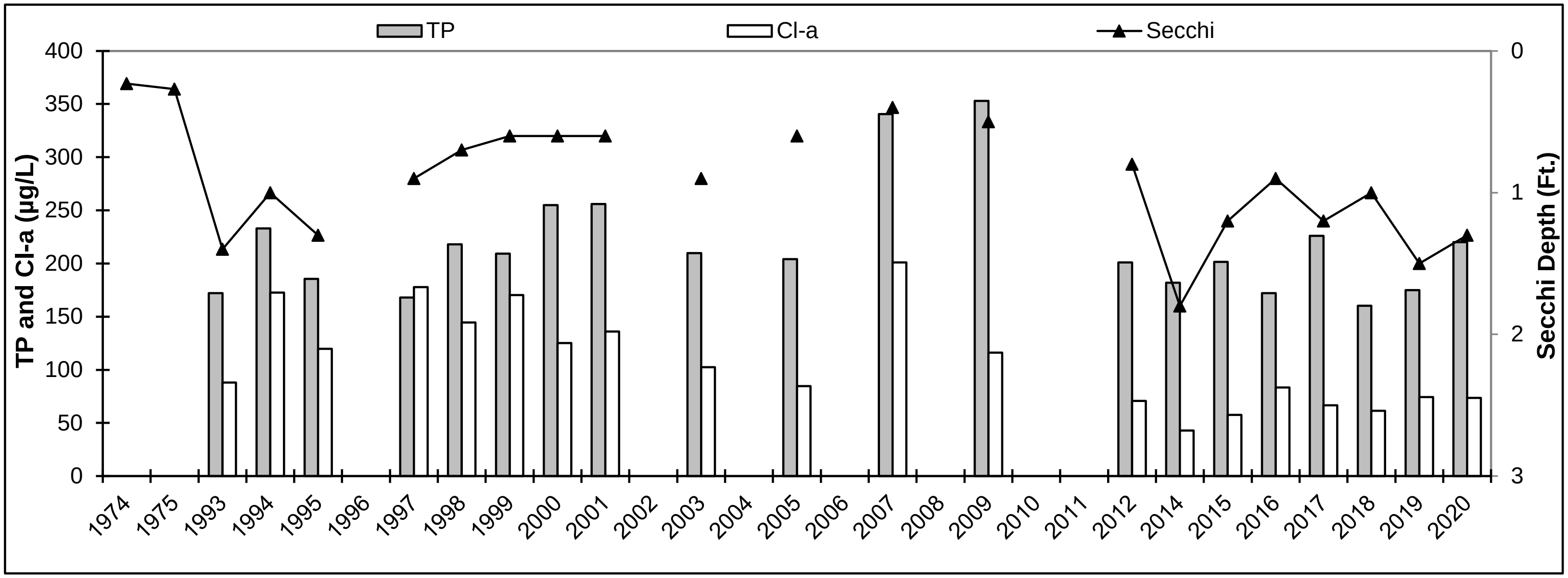
2020 Median Values

pH		8.61
Specific Conductivity	mS/cm	0.27
Turbidity	NTU	58.75
D.O.	mg/l	9.61
D.O.	%	105.53
Temp.	°F	73.59
Salinity	%	0.13
Cl-a	µg/L	59.35
T.P.	µg/l	198.5
Secchi	ft	1.25

Typo Lake		Date	5/4/2020	5/19/2020	6/3/2020	6/25/2020	7/9/2020	7/28/2020	8/11/2020	8/25/2020	9/9/2020	9/24/2020			
2020 Water Quality Data		Time	14:15	11:30	10:30	10:24	9:55	10:20	9:45	9:55	10:00	9:50			
	Units	R.L.*											Average	Min	Max
pH		0.1	8.79	8.61	8.58	8.43	8.07	8.88	9.14	9.13	8.53	8.61	8.68	8.07	9.14
Specific Conductivity	mS/cm	0.01	0.267	0.285	0.271	0.315	0.294	0.227	0.218	0.233	0.266	0.289	0.267	0.218	0.315
Turbidity	FNRU	1	35.00	57.20	65.70	72.40	109.00	106.00	12.1	43.60	60.30	20.40	64	12	109
D.O.	mg/l	0.01	10.99	10.80	11.23	8.41	5.72	6.75	12.22	9.91	7.60	9.30	9.29	5.72	12.22
D.O.	%	1	117.8	107.1	137.4	100.0	75.6	83.2	141.5	127.1	75.2	104.0	106.9	75.2	141.5
Temp.	°C	0.1	16.15	15.00	23.56	22.90	27.63	26.52	23.31	26.63	14.34	19.31	21.54	14.34	27.63
Temp.	°F	0.1	61.1	59.0	74.4	73.2	81.7	79.7	74.0	79.9	57.8	66.8	70.8	57.8	81.7
Salinity	%	0.01	0.13	0.13	0.13	0.15	0.14	0.11	0.11	0.11	0.12	0.14	0.1	0.1	0.2
Cl-a	µg/l	1	17.80	50.70	38.30	57.30	97.90	85.20	117.00	61.40	187.00	22.20	73.5	17.8	187.0
T.P.	mg/l	0.005	0.091	0.130	0.118	0.199	0.316	0.462	0.240	0.198	0.318	0.129	0.220	0.091	0.462
T.P.	µg/l	5	91	130	118	199	316	462	240	198	318	129	220	91	462
Secchi	ft	0.10	1.83	1.33	1.75	0.92	0.75	0.75	0.75	1.42	1.16	2.42	1.3	0.8	2.4
Secchi	m	0.10	0.56	0.41	0.53	0.28	0.23	0.23	0.23	0.43	0.35	0.74	0.4	0.2	0.7
Physical			2.0	1.0	3.0	2.0	3.0	3.00	3.00	2.0	3.0	2.0	2.4	1.0	3.0
Recreational			2.0	1.0	2.0	3.0	2.0	3.00	3.00	2.0	2.0	2.0	2.2	1.0	3.0

*reporting limit

Historic Annual Averages



Historical Report Card

Year	TP	Cl-a	Secchi	**Overall**
1974			F	**F**
1975			F	**F**
1993	F	F	F	**F**
1994	F	F	F	**F**
1995	F	F	F	**F**
1997	F	F	F	**F**
1998	F	F	F	**F**
1999	F	D	F	**F**
2000	F	F	F	**F**
2001	F	F	F	**F**
2003	F	F	F	**F**
2005	F	F	F	**F**
2007	F	F	F	**F**
2009	F	F	F	**F**
2012	F	D	F	**F**
2014	F	C	F	**D-**
2015	F	D	F	**F**
2016	F	F	F	**F**
2017	F	D	F	**F**
2018	F	D	F	**F**
2019	F	D	F	**F**
2020	F	D	F	**F**
State Standards	60 ug/L	20 ug/L	>3.3 ft	

Martin Lake

Linwood Township, Lake ID # 02-0034

Background

Martin Lake is located in northeast Anoka County. It has a surface area of 223 acres and maximum depth of 20 ft. The public access is located on the southern end of the lake. The lake is used moderately by recreational boaters and fishers, and would likely be used more if water quality improved. Martin Lake is almost entirely surrounded by private residences. The 5,402-acre watershed is 18% developed; the remaining 82% is vacant, agricultural, or wetlands. The non-native, invasive plant curly-leaf pondweed is present in Martin Lake but not at nuisance levels. Martin is on the MPCA's list of impaired waters for excess nutrients.

2020 Results

In 2020 Martin Lake had a C letter grade. During 2016-2018 the lake had a pattern of declining phosphorus levels, including a record low of 53.1µg/L in 2018. Total phosphorus levels were higher in 2019, but declined again in 2020 averaging 56.8 µg/L. Even though total phosphorus levels were higher in 2019, they were better than the average of 92.7 µg/L during 1997-2015. 2019 was the wettest year on record for the area, and increased runoff from the watershed may have played a role in higher 2019 phosphorus. Following that pattern, 2020 had below average rainfall, and we saw phosphorus levels in the lake recede.

In 2020, chlorophyll-a averaged 31.4 µg/L, a slight decrease increase from the 2019 average of 32.8 µg/L. Cl-a levels have been on a fairly steady incline since 2014 which had the lowest recorded average of 15.5 µg/L. While the 5-year (2016-2020) average (29.1 µg/L) has been much lower than the 2005-2009 average (108.3 µg/L), it remains above the impairment standard of 14 µg/L.

Average Secchi transparency was 3.0 feet in 2020, a slight decrease from 3.3 feet in 2019 but on par with the historical average of 2.9 feet for the lake. Secchi transparency remains about 30% below the State impairment threshold of 4.6 feet.

Trend Analysis

Twenty years of water quality data have been collected by the MPCA (1983), Metropolitan Council (1998, 2008), and the ACD (1997, 1999-2001, 2003, 2005, 2007, 2009, 2012-2020). Citizens monitored Secchi transparency 17 other years. Anecdotal notes from DNR fisheries data indicate poor water quality dating back to at least 1954. Although still poor, water quality in Martin Lake has shown an improvement from 1983 to 2020 that is statistically significant (repeated measures MANOVA with response variables TP, Cl-a, and Secchi depth; $F_{2, 16}=5.52$, $p < 0.05$). This is especially true for the last decade. Further examination of the data shows that while TP and Secchi transparency have not changed in the long-term since 1983, chlorophyll-a concentrations have shown a statistically significant decrease ($p < 0.01$) over this time. Water quality in Martin Lake declined through the late 1990s and reached its worst in 2007. In the nine years sampled since 2007, both TP and Secchi transparency have improved on a statistically significant basis ($p < 0.01$).

Discussion

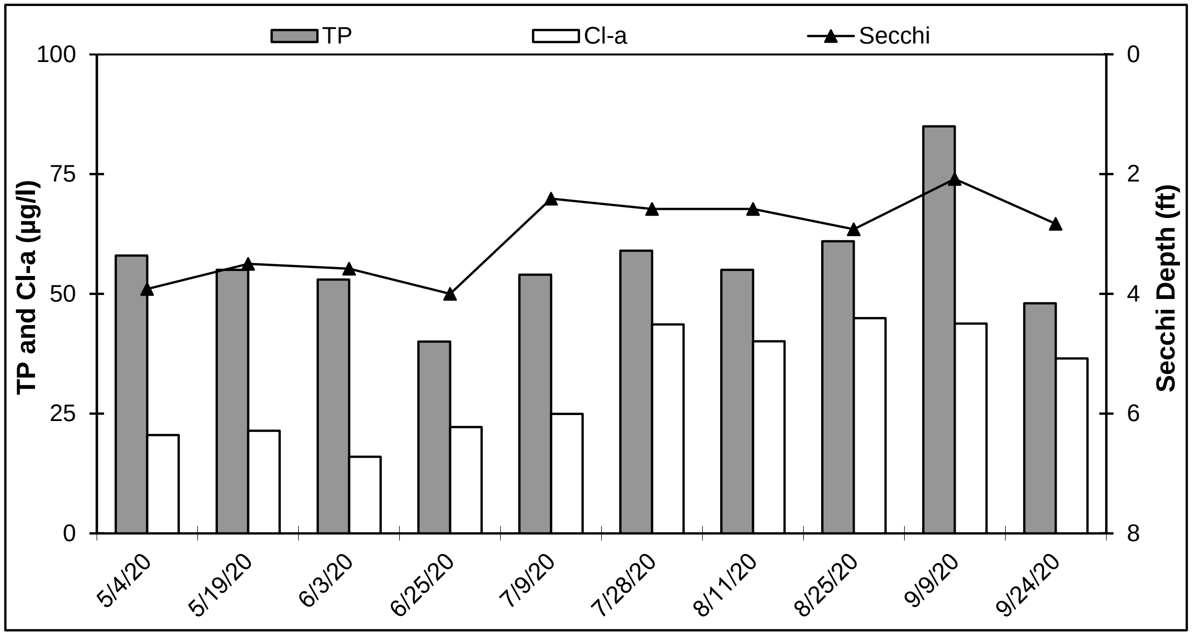
Martin Lake, along with Typo Lake upstream, was the subject of a TMDL study by the Anoka Conservation District that was approved by the State and EPA in 2012. This study documented the sources of nutrients to the lake, the degree to which each is impacting the lake, and put forward lake rehabilitation strategies. Water from Typo Lake and internal loading (carp, septic systems, sediments, etc.) are two of the largest negative impacts on Martin Lake water quality. Upstream of Typo Lake, a feasibility study was completed in early 2018 regarding restoration of ditched wetlands (Ditch 20). This study identified 4 potential projects and also recommends that dredging of Ditch 20 not occur.

Carp removals and restoration of two lake-adjacent stormwater ponds took place in 2020 and additional projects are planned in in the near future. Shoreline conditions on Martin Lake were inventoried during a 2019/2020 shoreline survey. This inventory will assist in identifying future lakeshore restoration projects. Recent water quality monitoring results suggest these management approaches are improving conditions in these lakes, but reaching goals will require additional effort and time.

MARTIN LAKE

LINWOOD TOWNSHIP, LAKE ID # 30-0009

2020 Results



2020 Median Values

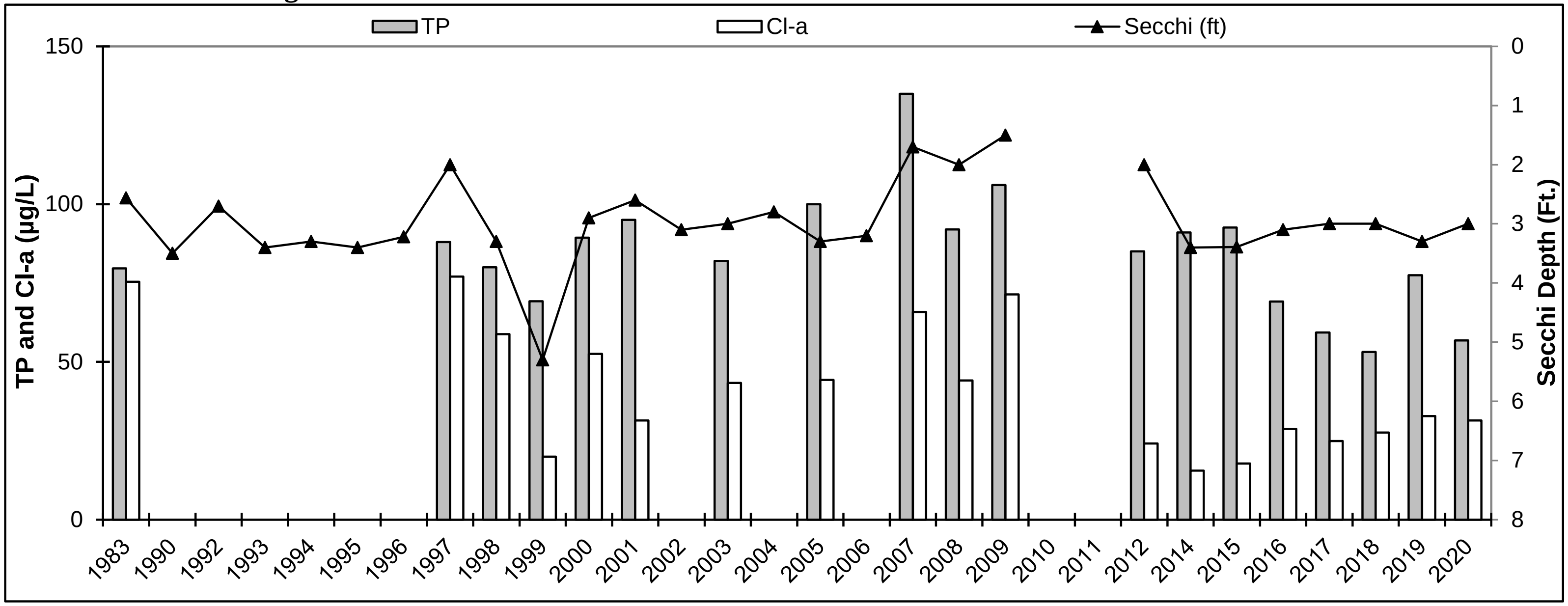
pH		8.56
Specific Conductivity	mS/cm	0.297
Turbidity	NTU	18.2
D.O.	mg/l	10.17
D.O.	%	121.35
Temp.	°F	73.85
Salinity	%	0.14
Cl-a	µg/L	30.7
T.P.	µg/l	55
Secchi	ft	2.8

Martin Lake
2020 Water Quality Data

	Units	R.L.*	5/4/2020	5/19/2020	6/3/2020	6/25/2020	7/9/2020	7/28/2020	8/11/2020	8/25/2020	9/9/2020	9/24/2020	Average	Min	Max
Time:			13:42	12:00	12:00	11:00	10:30	10:55	10:30	10:20	10:30	10:15			
pH		0.1	8.92	8.45	8.41	8.61	8.50	8.62	8.47	8.87	8.21	8.86	8.59	8.21	8.92
Specific Conductivity	mS/cm	0.01	0.283	0.291	0.292	0.304	0.301	0.297	0.297	0.290	0.303	0.299	0.296	0.283	0.304
Turbidity	FNRU	1	8.30	7.20	13.30	4.80	25.10	19.10	33.60	18.20	34.90	17.50	16.34	4.80	34.90
D.O.	mg/l	0.01	11.42	10.01	13.30	10.27	8.24	10.07	9.67	11.48	8.27	12.60	10.53	8.24	13.30
D.O.	%	1	115.0	100.1	156.9	125.1	107.5	130.8	117.6	146.3	87.2	139.4	122.6	87.2	156.9
Temp.	°C	0.1	14.24	14.34	23.14	23.36	28.05	25.77	24.02	26.35	17.96	18.71	21.6	14.2	28.1
Temp.	°F	0.1	57.6	57.8	73.7	74.0	82.5	78.4	75.2	79.4	64.3	65.7	70.9	57.6	82.5
Salinity	%	0.01	0.13	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.14	0.13	0.15
Cl-a	ug/L	1	20.50	21.40	16.00	22.20	24.90	43.60	40.10	44.90	43.80	36.50	31.4	16.0	44.9
T.P.	mg/l	0.005	0.058	0.055	0.053	0.040	0.054	0.059	0.055	0.061	0.085	0.048	0.057	0.040	0.085
T.P.	ug/l	5	58	55	53	40	54	59	55	61	85	48	56.8	40	85
Secchi	ft	0.1	3.92	3.50	3.58	4.00	2.41	2.58	2.58	2.9	2.1	2.8	3.0	2.1	4.0
Secchi	m	0.1	1.19	1.07	1.09	1.22	0.73	0.79	0.79	0.89	0.63	0.86	0.9	0.6	1.2
Physical			2.0	2.0	2.0	1.0	1.0	3.0	2.0	2.0	2.0	2.0	1.9	1.0	3.0
Recreational			1.0	1.0	1.0	1.0	2.0	3.0	1.0	1.0	2.0	2.0	1.5	1.0	3.0

*reporting limit

Historic Annual Averages



Historical Report Card

Year	TP	Cl-a	Secchi	Overall
1996			D	**D**
1997	D	D	F	**D**
1998	D	D	D	**D**
1999	C	B	C	**C**
2000	D	C	D	**D**
2001	D	C	D	**D**
2002			D	**D**
2003	D	C	D	**D**
2004			D	**D**
2005	D	C	D	**D**
2006			D	**D**
2007	D	D	F	**D**
2008	D	C	F	**D**
2009	D	D	F	**D**
2012	D	C	F	**D**
2014	D	B	D	**C**
2015	D	B	D	**C**
2016	C	C	D	**C**
2017	C	C	D	**C**
2018	C	C	D	**C**
2019	C	C	D	**C**
2020	C	C	D	**C**
State Standards	40 ug/L	14 ug/L	>4.6 ft	

Stream Water Quality

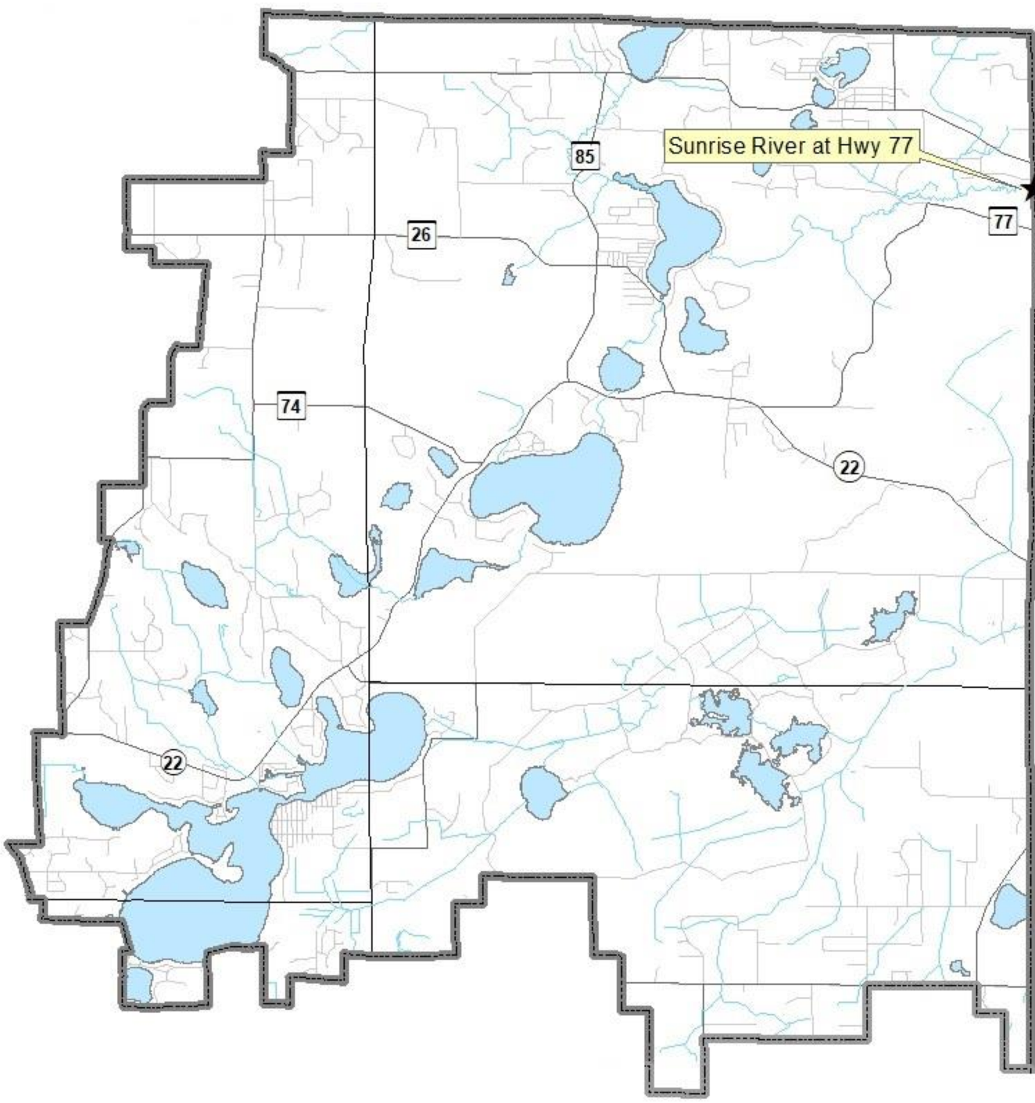
Description: In 2019 and 2020, the Sunrise River water quality monitoring site at Highway 77 was being monitored using funds from an MPCA Surface Water Assessment Grant (SWAG). Stream water quality was monitored on twelve occasions in 2020, including five grab samples. The selected site is at the furthest downstream limit of the Sunrise River Watershed Management Organization's jurisdictional area, and the Anoka County border. Parameters monitored include water level, pH, specific conductivity, turbidity, chlorides, transparency, dissolved oxygen, total phosphorus, and total suspended solids.

Purpose: To detect water quality trends and problems, and diagnose the source of problems.

Location: Sunrise River at Hwy 77

Results: Results are presented on the following pages.

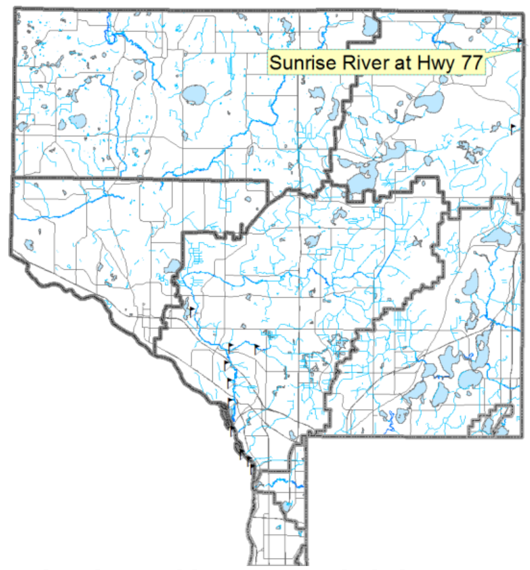
2020 Sunrise River Watershed Stream Water Quality Monitoring Sites



SUNRISE RIVER WEST BRANCH AT HWY 77

Near Fawn Lake Dr. NE, Linwood Township

STORET SiteID = S001-424



Years Monitored

2001, 2003, 2006, 2012, 2015, 2018-2020

Background

This monitoring site is near the downstream extent of the Sunrise River Watershed in Anoka County, at the Chisago County border. Upstream, this river drains through Rice, Boot, Linwood, Island, Martin, and Typo Lakes. The Sunrise River Watershed Management Organization historically monitors this site because it is where the river leaves their jurisdiction. Additionally, monitoring is considered important because this portion of the river is impaired for aquatic life with turbidity identified as a stressor. This site is included in the MN Pollution Control Agency's Cycle II Monitoring for the Lower St. Croix Watershed which began in 2019 and will run through 2020. A TMDL study was completed in 2013.

Methods

The river was monitored on 12 occasions in 2020. All monitoring during 2020 was completed during baseflow conditions. Parameters tested with portable meters included pH, specific conductivity, turbidity, temperature, dissolved oxygen, and salinity. Parameters tested by water quality grab samples sent to a state-certified lab included total phosphorus, chlorides, and total suspended solids. Grab samples were taken and analyzed by a laboratory at the beginning of each month monitored.

Summarized Results

Summarized water quality monitoring findings and management implications include:

- Specific conductivity was below the county median of 0.420 mS/cm. The median specific conductivity was 0.322 mS/cm. The median specific conductivity for all years at this site is 0.315 mS/cm. For management considerations see chlorides.
- Chlorides were measured at this site in all years, except 2015. In 2020, the median chloride concentration was 19.5 mg/L, a slight increase from 2019. The median for all years at this site is 16.5 mg/L and the countywide median is 13.29 mg/L which are both well below the state standard of 230 mg/L
  Management discussion: Road deicing salts are a concern region-wide. Chlorides are measurable in area streams year-round, including in the Sunrise River. While chloride levels may be low compared to state standards, excessive salt use should be avoided.
- Suspended solids and turbidity levels were similar in 2020 compared to other years monitored. The median for all years at this site is 17 mg/L TSS. These levels are higher than most other Anoka County streams, but still below the state standard of 30 mg/L TSS.
  Management discussion: Efforts to reduce suspended material in upstream lakes will likely help decrease turbidity and suspended solids throughout the Sunrise River.
- Phosphorus has fluctuated above and below the water quality standard for the Central River Nutrient Region of ≤100 μg/L. The 2020 median for TP was 67.0 ug/L, which was lower than previous years (2018 median of 101.5 ug/L). The median TP for all years at this site is 87 μg/L.
  Management discussion: Management in upstream lakes will help reduce phosphorus in the river.
- pH was within the range considered normal and healthy for streams in this area. The median pH was 7.56.
- Dissolved oxygen (DO) was typically within the range considered normal and healthy.

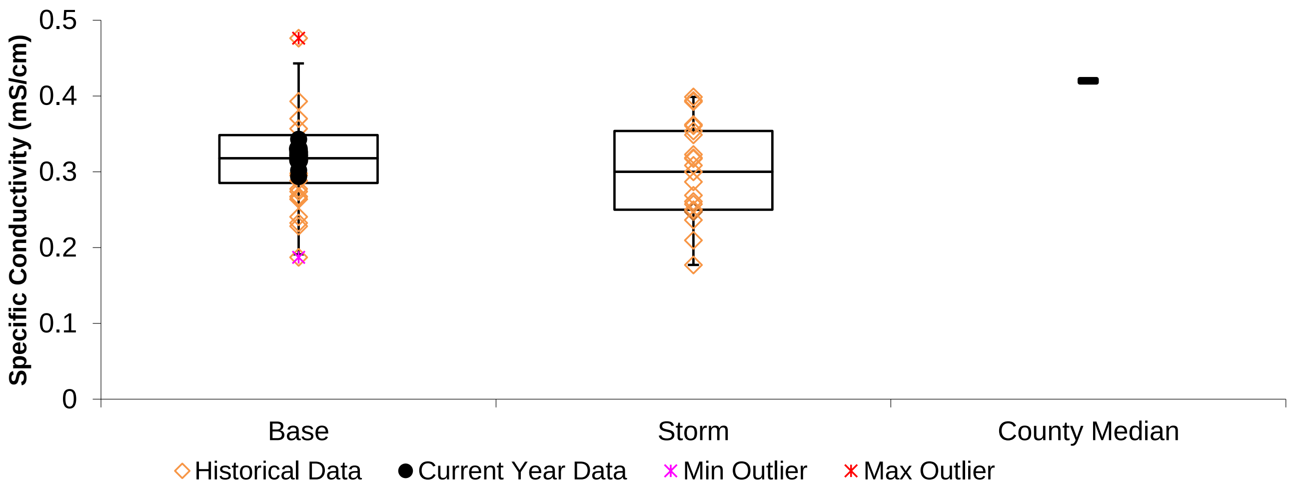
Below the data are presented and discussed for each parameter in greater detail. Management recommendations will be included at the conclusion of this report.

Specific conductivity

Specific conductivity and chlorides are measures of dissolved pollutants. Dissolved pollutant sources include urban road runoff, industrial chemicals, and others. Metals, hydrocarbons, and road salts are often of concern in a suburban environment. Specific conductivity is the broadest measure of dissolved pollutants we use. It measures electrical conductivity of water standardized for temperature; pure water with no dissolved constituents has zero specific conductivity.

Specific conductivity was acceptably low in the West Branch of the Sunrise River. Median specific conductivity for 2020 was 0.322 mS/cm. This is lower than the 2019 median which included some of the highest specific conductivity readings on record. The 2020 median for the site was also lower than the median for Anoka County streams (0.420 mS/cm). Specific conductivity has historically been lower during storms, suggesting that stormwater runoff contains fewer dissolved pollutants than the surficial water table that feeds the river during baseflow. Increased specific conductivity levels during baseflow conditions has been observed in many Anoka County streams. This has led to the determination that the largest contributor to rising specific conductivity levels is road deicing salts that have infiltrated into the shallow aquifer.

Specific conductivity during baseflow and storm conditions. Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).

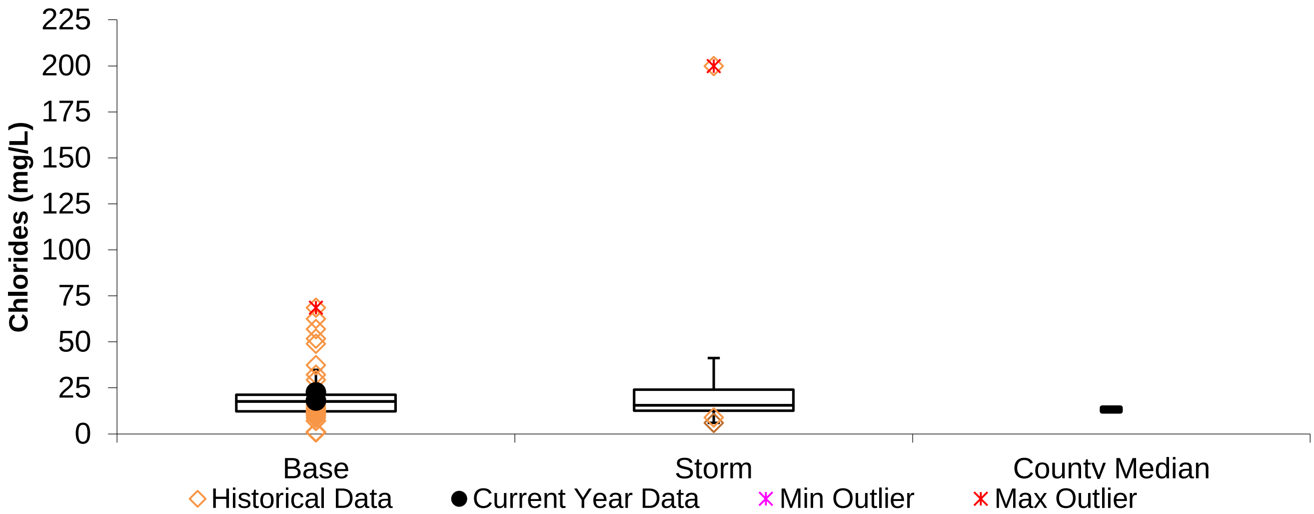


Chlorides

Chlorides are the measure of chloride salts, the most common of which are road de-icing chemicals and those used in water softening. Chlorides can also be present in other pollutant types, such as wastewater. These pollutants are of concern because of the effect they can have on the stream's biological community. Specific Conductivity data, reported above, is commonly used as an indicator for chlorides, with higher specific conductivity generally corresponding to higher chlorides.

Chloride concentrations in the West Branch of the Sunrise River are higher than the median for Anoka County (13.29 mg/L). In 2020 the median chloride concentration was 19.5 mg/L, slightly more than in 2019 but well below the state standard of 230 mg/L. A waterbody is considered impaired if two or more samples exceed the state standard in a three-year period. Only a couple of storm samples have been collected at this site for chlorides, but they have followed the pattern seen in specific conductivity with higher readings during baseflow conditions and further supports the finding that road deicing salts seeping into the shallow aquifer are a primary cause of higher baseflow chloride and specific conductivity readings.

Chlorides during baseflow and storm conditions. Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).



Turbidity and Total Suspended Solids (TSS)

Turbidity and total suspended solids (TSS) are two different measurements of solid material suspended in the water. Turbidity is measured by the refraction of a light beam passed through a water sample. It is most sensitive to large particles. Total suspended solids are measured by filtering solids from a water sample and weighing the filtered material. The amount of suspended material is important because it affects transparency and aquatic life, and because many other pollutants are attached to particles. Many stormwater treatment practices such as street sweeping, sumps, and stormwater settling ponds target sediment and attached pollutants.

It is important to note that suspended solids can come from sources within the river itself or outside of the river from the contributing watershed. Sources from the watershed include soil erosion, road sanding, and others. In-stream sources of TSS include riverbank erosion and movement of the river bottom. Finally, algae from the river and upstream lakes contribute to suspended solids.

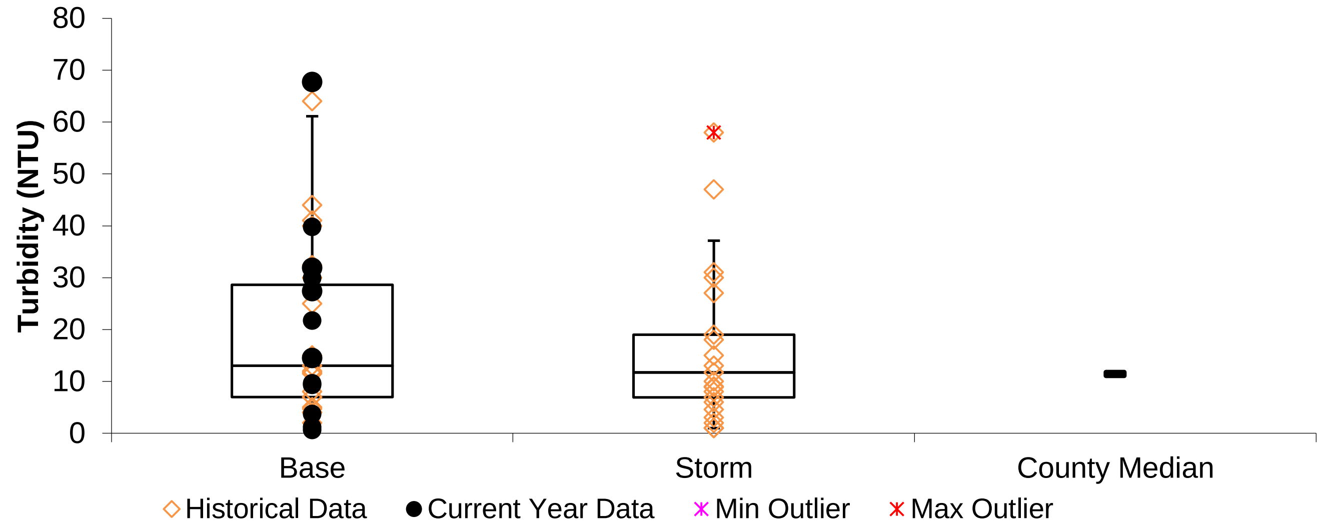
Turbidity is no longer used to determine if a stream is impaired. Instead, total suspended solids is used. Turbidity is still a helpful and easy to measure parameter. Generally, turbidity below 25 NTU is acceptable; previously this was the State's standard. When that standard was in place a stream was impaired if it exceeded this value on three occasions and at least 10% of all sampling events. Including all years of data, the West Branch of the Sunrise River has exceeded 25 NTU on 19 of 72 sampling occasions (26%). Turbidity increased in 2020, with five of twelve samples surpassing the state standard (42%).

The most obvious source of turbidity is algae from upstream lakes. Three upstream lakes are impaired for excess nutrients and high algae. They include Linwood, Martin, and Typo Lakes. The river sampling site is 3 miles downstream from Martin Lake. The area between the lake and sampling site is wide floodplain fringe and forest with little human impact that would not be expected to add much sediment to the river. Therefore, efforts to reduce suspended material in the river should focus on the upstream lakes. It is also worth noting that this section of the river has unconsolidated bottom material which can re-suspend and contribute to turbidity.

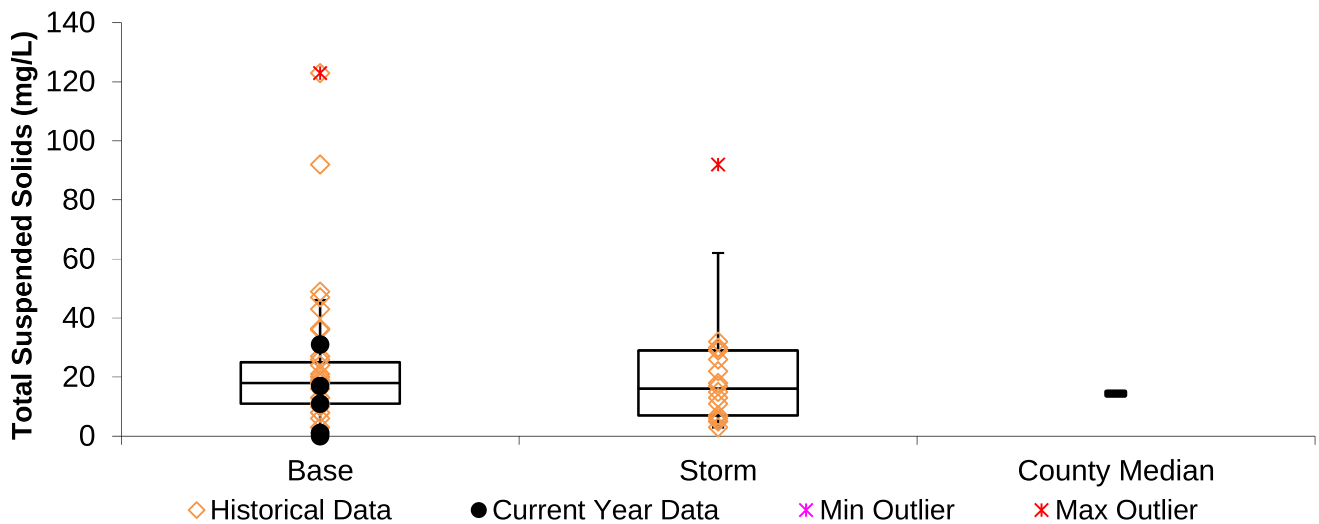
Total suspended solids in the West Branch of the Sunrise River has exceeded the State standard for this region. The standard is no more than 10% of samples exceeding 30 mg/L during April 1-September 30. Over all years monitored the West Branch exceeded the standard on 17% of sampling occasions (10 of 57).

In 2020 total suspended solid concentrations increased compared to 2019 with one sample exceeding 30 mg/L. In 2020, all samples were taken during baseflow. Other years of sampling included storm events. Higher concentrations of suspended solids may be from any combination of turbulence mobilizing sediment during higher stream flows, flushing of upstream lakes, and/or overland stormwater flow. Overland flow is relatively low in this subwatershed, which is largely forested and wetland.

Turbidity during baseflow and storm conditions Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).



Total suspended solids during baseflow and storm conditions Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).

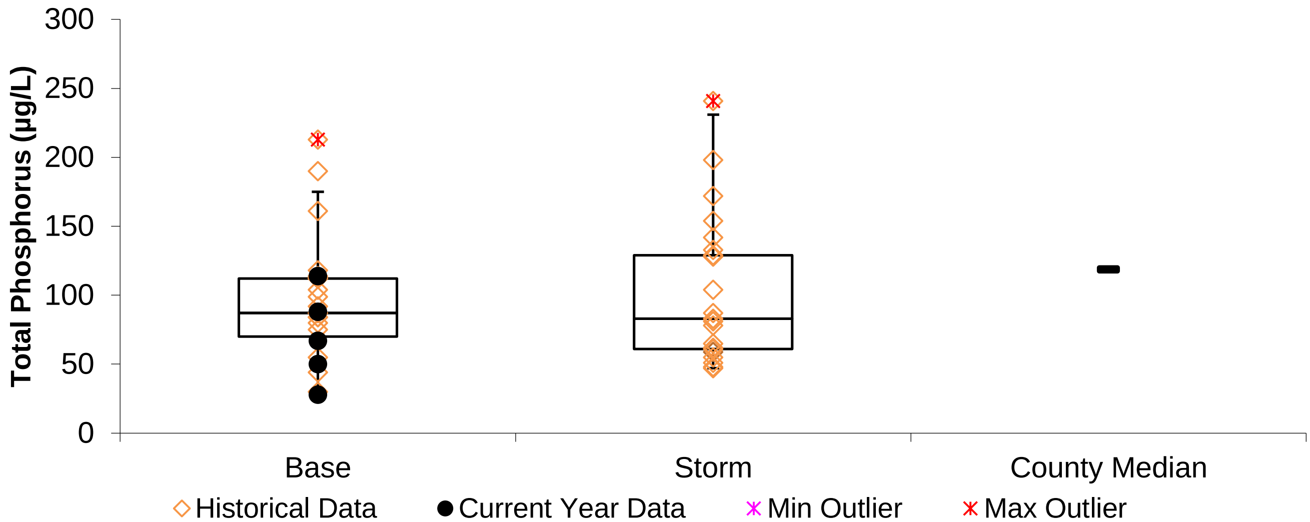


Total Phosphorus

The nutrient phosphorus is one of the most common pollutants in our region and can be associated with urban runoff, agricultural runoff, wastewater, and many other sources. Total phosphorus (TP) in the West Branch of the Sunrise River often exceeds the state standard of 100 µg/L. In 2020 the median phosphorus concentration was 67 ug/L but did exceed the state standard during one of the five sampling events. There was a decrease from the 2019 median of 72.0 ug/L, and a match of one exceedance of 100 µg/L. The median phosphorus concentration in the West Branch of the Sunrise River across all years monitored is 87.0 µg/L. Over all years sampled, 22 of 58 samples (38%) have exceeded the standard of 100 µg/L. These phosphorus concentrations are common for the area. There has generally not been a large difference between storm and baseflow TP concentrations during historical monitoring. All 2019 and 2020 sampling occurred during baseflow conditions.

In the case of the West Branch of the Sunrise River phosphorus levels are, at least in part, reflective of conditions of Martin Lake located 3 miles upstream from the sampling site. Martin Lake is impaired for excess phosphorus, with a summertime average of 79.2 µg/L over the last 10 years. Water quality improvements to Martin Lake will benefit the river downstream. Recent upstream projects including carp barriers, carp harvests, and stormwater retrofits, coincide with improved conditions in upstream lakes, but those benefits are not yet apparent in the West Branch of the Sunrise River.

Total phosphorus during baseflow and storm conditions. Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).



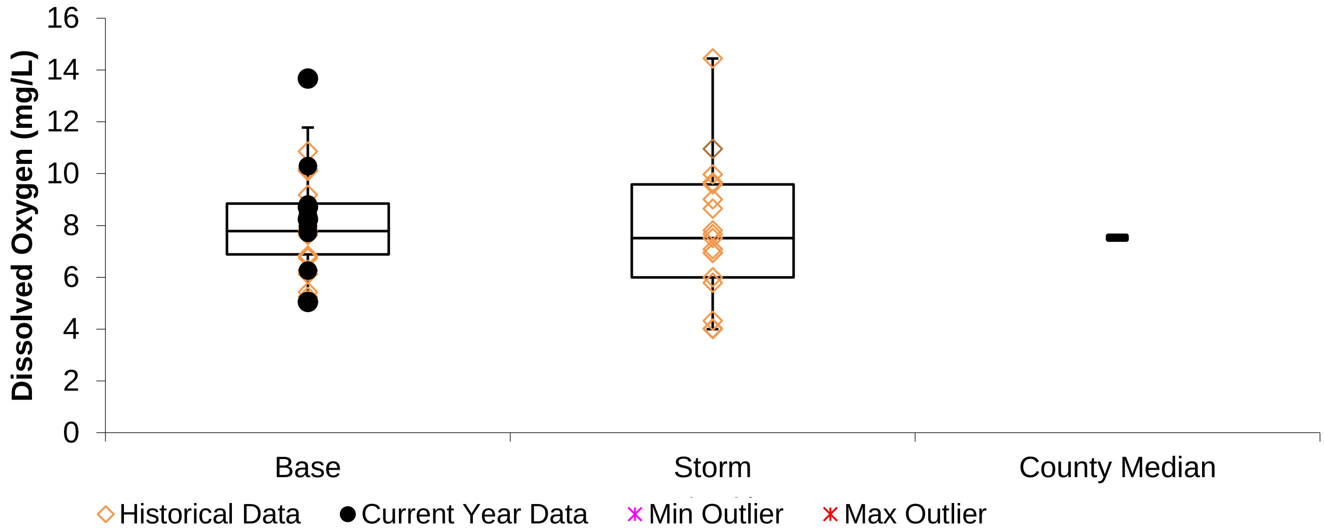
Dissolved Oxygen

Dissolved oxygen is necessary for aquatic life, including fish. Organic pollution causes oxygen consumption when it decomposes. If oxygen levels fall below 5 mg/L aquatic life begins to suffer, therefore the State water quality standard is a daily minimum of 5 mg/L. The stream is impaired if 10% of observations are below this level in the last 10 years. Dissolved oxygen levels are typically lowest in the early morning because of decomposition consuming oxygen at night without offsetting oxygen production by photosynthesis, which occurs during the day.

For the West Branch of the Sunrise River there are two datasets to consider. First, spot measurements were taken with the other water quality monitoring described in this report. Dissolved oxygen has been found at less than 5 mg/L on three out of 52 occasions. All were during storm events in prior years, occurring in 2003, 2012 and 2015. In 2020, there was one case in early July, where DO hit 5.05 mg/L, narrowly avoiding the daily minimum of 5 mg/L.

The second data set is around-the-clock DO measurements collected for eight days in by the MPCA in 2012. They found that DO dipped below 5 mg/L every morning. The river has been designated as impaired for poor fish and invertebrate communities. Although it is not listed as impaired for DO specifically, low DO concentration occurring each morning in this stream is a likely stressor on these organisms.

Dissolved oxygen results during baseflow and storm conditions Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).

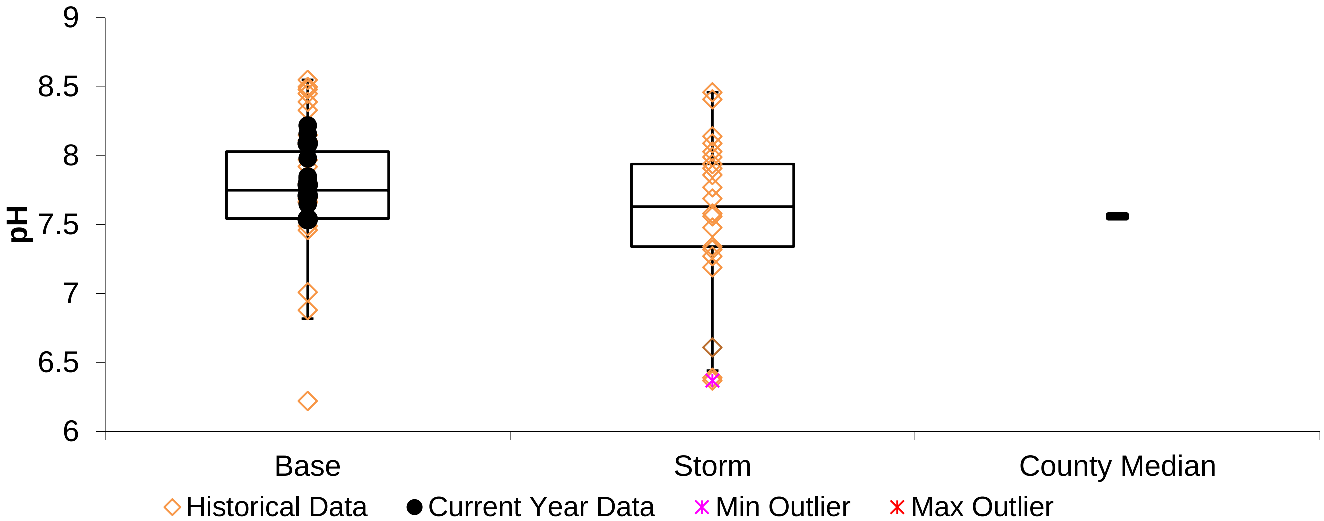


pH

pH refers to the acidity of the water. The MPCA's water quality standard is for pH to be between 6.5 and 8.5. The West Branch of the Sunrise River is regularly within this range (see figure below). It often has slightly higher pH than other streams because of the impact of algal production in upstream lakes.

It is interesting to note that pH is generally lower during storms than during baseflow. This is because the pH of rain is typically lower (more acidic). While acid rain is a longstanding problem in some areas, its effect on this aquatic system is small. In 2018, there was one occurrence of sub-standard pH in October when pH was 5.66. This is not overly concerning. pH was within the normal range (7.54 to 8.22) for all samples in 2020.

pH results during baseflow and storm conditions Orange diamonds are historical data from previous years and black circles are 2020 readings. Box plots show the median (middle line), 25th and 75th percentile (ends of box), and 10th and 90th percentiles (floating outer lines).



Recommendations

Water quality in the West Branch of the Sunrise River is poorer than ideal. A Total Maximum Daily Load (TMDL) study was completed in 2013 to determine impairments of this river. The study found that aquatic life in this river was struggling with turbidity identified as the main stressor. Low dissolved oxygen may also be a stressor contributing to aquatic life impairment. At this time, it appears that algae and nutrients in upstream lakes are a primary source of problems. Dissolved oxygen is not low in the lakes, however, and low nighttime levels in the river may be related to decomposition occurring in the large wetland floodplain. Future water quality management should be targeted at upstream lakes. Ongoing and upcoming projects include stormwater retrofits at Martin Lake and common carp management in the chain of lakes.

Wetland Hydrology

Description: Continuous groundwater level monitoring at a wetland boundary. Countywide, the ACD maintains a network of 23 wetland hydrology monitoring stations.

Purpose: To provide understanding of wetland hydrology, including the impacts of climate and land use. These data aid in delineation of nearby wetlands by documenting hydrologic trends including the timing, frequency, and duration of saturation.

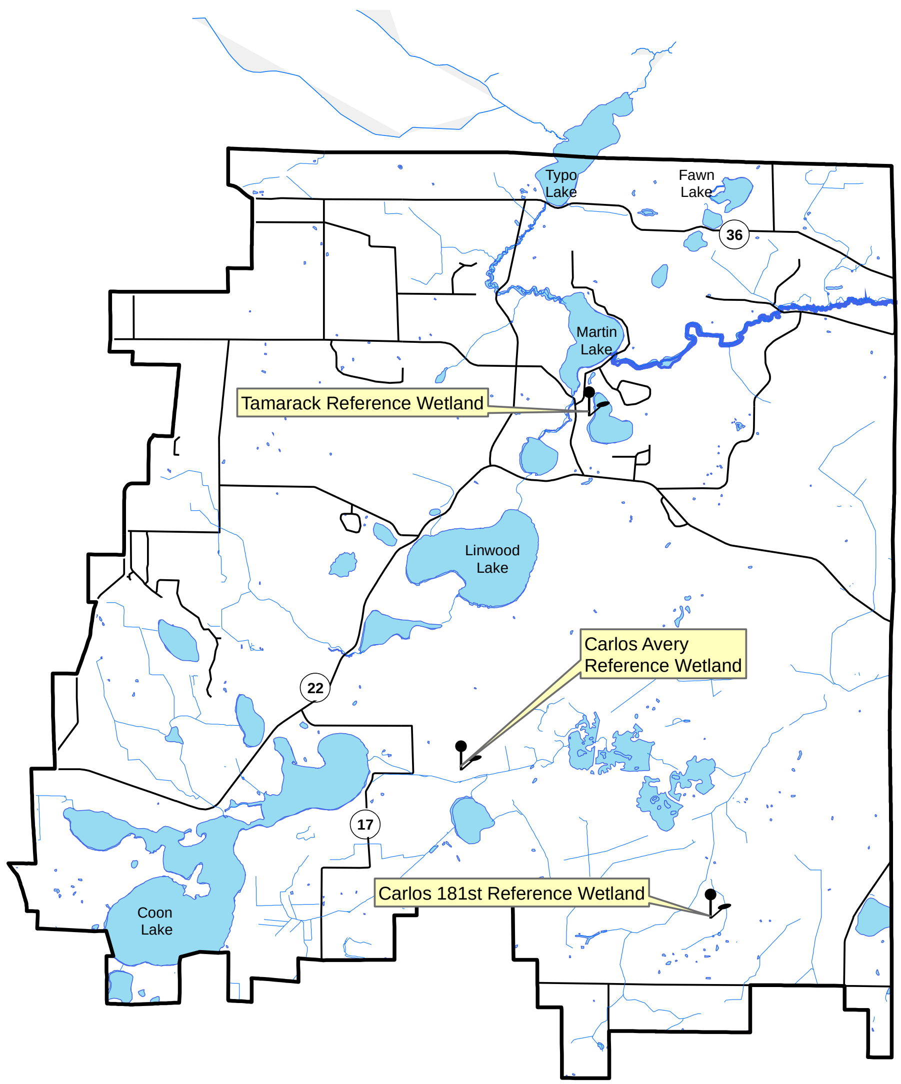
Locations: Carlos Avery Reference Wetland, Carlos Avery Wildlife Management Area, City of Columbus

Carlos 181st Reference Wetland, Carlos Avery Wildlife Management Area, City of Columbus

Tamarack Reference Wetland, Linwood Township

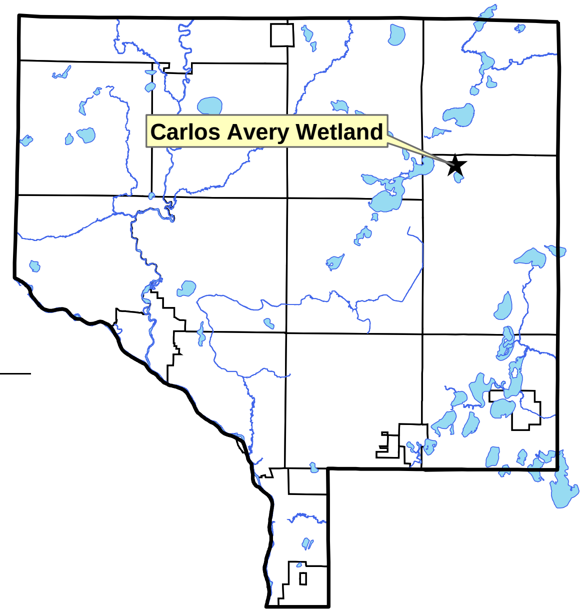
Results: See the following pages.

2020 Sunrise River Watershed Wetland Hydrology Monitoring Sites



CARLOS AVERY REFERENCE WETLAND

Carlos Avery Wildlife Management Area, City of Columbus



Site Information

Monitored Since: 1997

Wetland Type: 3

Wetland Size: >300 acres

Isolated Basin? No

Connected to a Ditch? Yes

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
Oa	0-4	N2/0	Organic	-
Bg	4-25	10yr 5/2	Sandy Loam	25% 10yr 5/6 with organic streaking

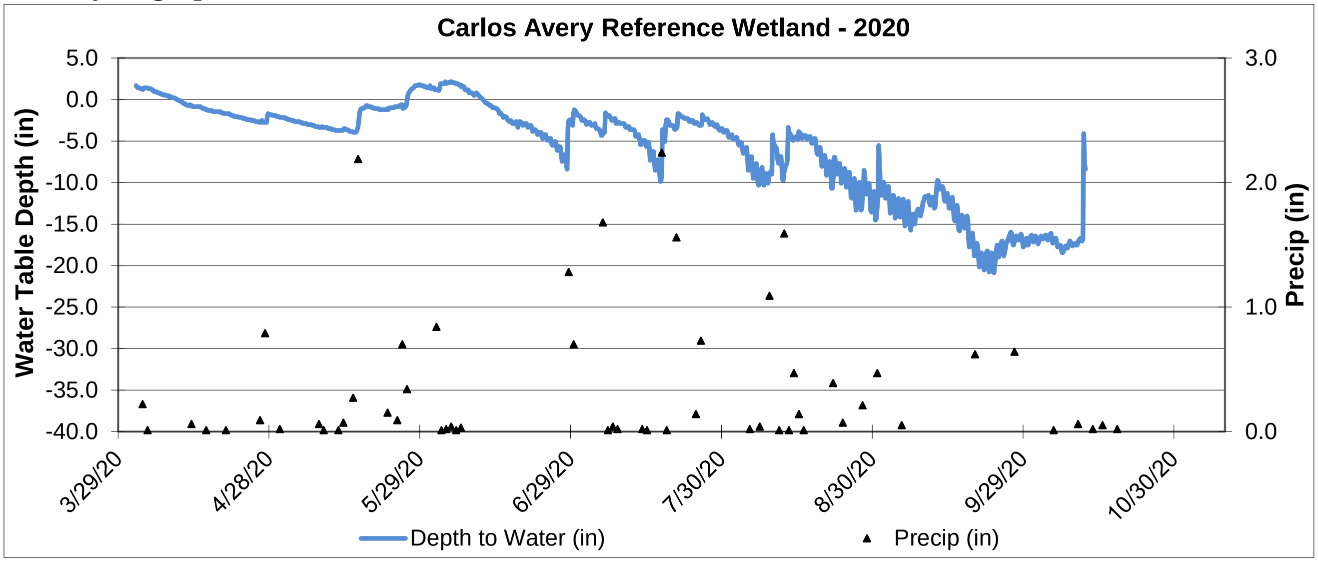
Surrounding Soils: Lino loamy fine sand

Vegetation at Well Location:

Scientific	Common	% Coverage
Phalaris arundinacea	Reed Canary Grass	80
Carex Spp	Sedge undiff.	40
Quercus macrocarpa	Bur Oak	40
Sagitaria latifolia	Broad-leaf Arrowhead	20
Cornus stolonifera	Red-osier Dogwood	20

Other Notes: This is a broad, expansive wetland within a state-owned wildlife management area. Cattails dominate within the wetland.

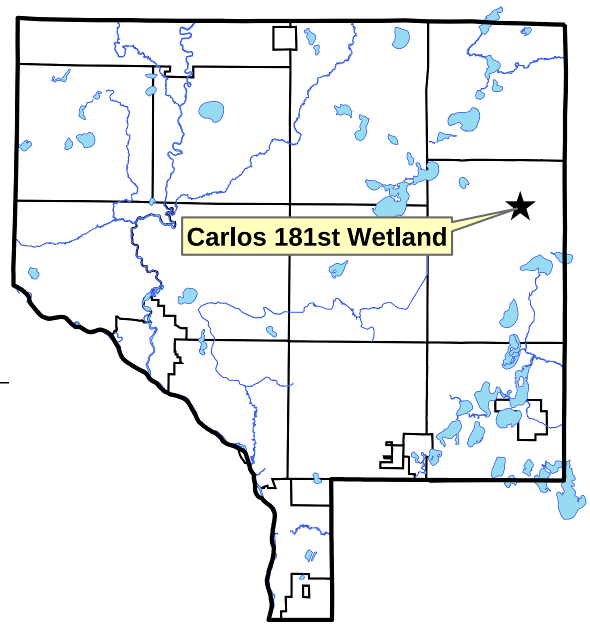
2020 Hydrograph



Wetland Hydrology Monitoring

CARLOS 181ST REFERENCE WETLAND

Carlos Avery Wildlife Management Area, City of Columbus



Site Information

Monitored Since: 2006

Wetland Type: 2-3

Wetland Size: 3.9 acres (approx.)

Isolated Basin? Yes

Connected to a Ditch? Roadside swale only

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
Oa	0-3	N2/0	Sapric	-
A	3-10	N2/0	Mucky Fine Sandy Loam	-
Bg1	10-14	10yr 3/1	Fine Sandy Loam	-
Bg2	14-27	5Y 4/3	Fine Sandy Loam	-
Bg3	27-40	5y 4/2	Fine Sandy Loam	-

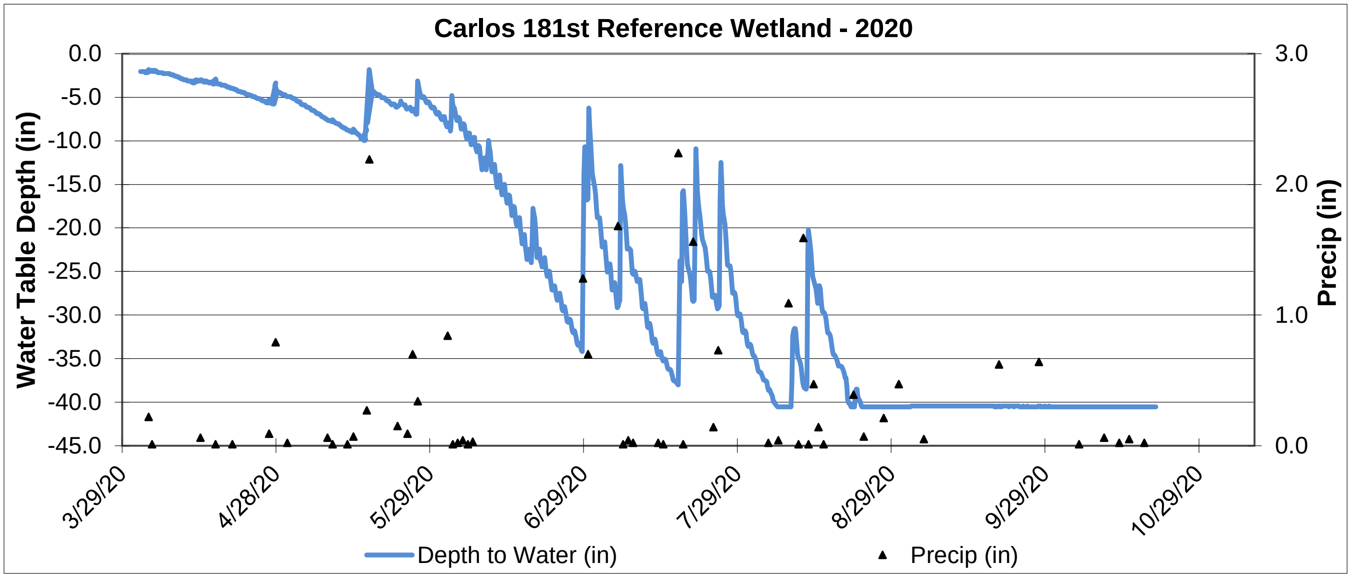
Surrounding Soils: Soderville fine sand

Vegetation at Well Location:

Scientific	Common	% Coverage
Phalaris arundinacea	Reed Canary Grass	100
Rhamnus frangula (S)	Glossy Buckthorn	40
Ulmus american (S)	American Elm	15
Populus tremulodies (T)	Quaking Aspen	10
Acer saccharum (T)	Silver Maple	10

Other Notes: The site is owned and managed by the MN DNR. Access is from 181st Avenue.

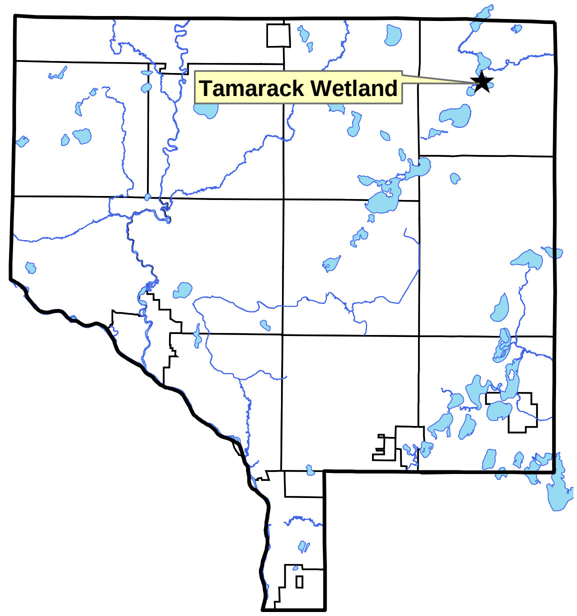
2020 Hydrograph



Wetland Hydrology Monitoring

TAMARACK REFERENCE WETLAND

Martin-Island-Linwood Regional Park, Linwood Township



Site Information

Monitored Since: 1999

Wetland Type: 6

Wetland Size: 1.9 acres (approx.)

Isolated Basin? Yes

Connected to a Ditch? No

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
A	0-6	N2/0	Mucky Sandy Loam	-
A2	6-21	10yr 2/1	Sandy Loam	-
AB	21-29	10yr3/2	Sandy Loam	-
Bg	29-40	2.5y5/3	Medium Sand	-

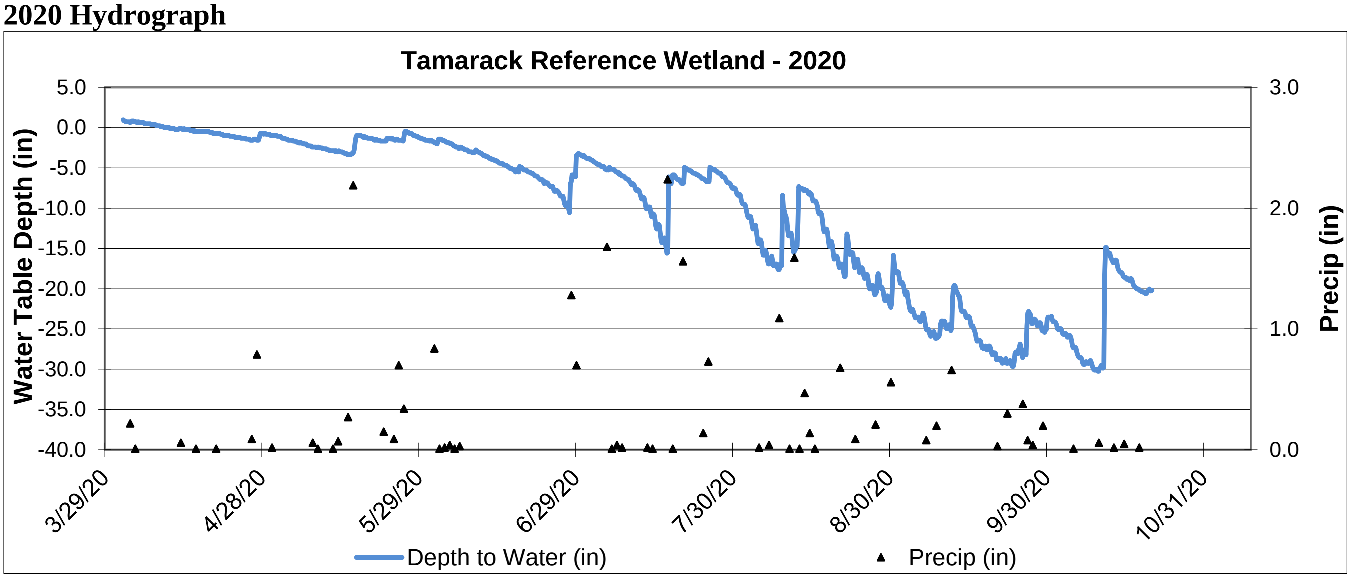
Surrounding Soils: Sartell fine sand

Vegetation at Well Location:

Scientific	Common	% Coverage
Rhamnus frangula	Common Buckthorn	70
Betula alleghaniensis	Yellow Birch	40
Impatiens capensis	Jewelweed	40
Phalaris arundinacea	Reed Canary Grass	40

Other Notes: The site is owned and managed by Anoka County Parks.

2020 Hydrograph



Water Quality Grant Fund

Description: The Sunrise River Watershed Management Organization (SRWMO) offers cost share grants to encourage projects that will benefit lake and stream water quality. These projects include lakeshore restorations, rain gardens, erosion correction, and others. These grants, administered by the ACD, offer cost sharing of the materials needed for a project. The landowner is responsible for some expenses. The ACD assists interested landowners with design, materials acquisition, installation, and maintenance.

Purpose: To improve water quality in area lakes, streams, and rivers.

Locations: Throughout the watershed.

Results: Projects reported in the year they are installed.

SRWMO Cost Share Fund Summary

2005 SRWMO Contribution	+	$1,000.00
2006 SRWMO Contribution	+	$1,000.00
2006 Expense - Coon Lake, Rogers Property Project	-	$ 570.57
2007 – no expenses or contributions		$ 0.00
2008 SRWMO Contribution	+	$2,000.00
2008 Expense - Martin Lake, Moos Property Project	-	$1,091.26
2009 SRWMO Contribution	+	$2,000.00
2010 SRWMO Contribution	+	$1,840.00
2011 SRWMO Contribution	+	$2,000.00
2012 SRWMO Contribution	+	$2,000.00
2012 Expense – Linwood Lake, Gustafson Property Project	-	$ 29.43
2012 Expense – Transfer to Martin-Typo Lakes Carp Barriers	-	$4,300.00
2013 – no expenses or contributions		$ 0.00
2014 SRWMO Contribution	+	$2,000.00
2015 SRWMO Contribution		$ 0.00
2016 SRWMO Contribution		$ 0.00
2016 Expense – Voss Rain Garden	-	$1,229.31
2017 Expense – Voss Rain Garden Plants	-	$ 654.50
2017 SRWMO Contribution	+	$1,000.00
2018 Surplus Funds Returned from ACD to SRWMO Gen Fund	-	$2,000.00
2018 Expense – Gunnink Coon Lakeshore	-	$1,148.40
2019 SRWMO Contribution		$ 0.00
2020 SRWMO Contribution	+	$2,000.00
2020 Expense – Scheiderich Coon Lakeshore Restoration	-	$3,395.86
2021 Expense – Encumbered for Linwood Elementary rain garden	-	$1,030.00
Fund Balance		**$1,390.47**

Sunrise River Chain of Lakes Carp Removal Project

Description: Martin and Typo Lakes fail to meet state water quality standards due to excessive phosphorus, which fuels algae blooms. As a result, the lakes are often strongly green or brown, and the game fishery is depressed. Carp are a major cause of poor water quality in these lakes, diminishing their value for swimming, boating, and fishing. Efforts to manage and reduce carp are being undertaken to improve water quality, habitat, and the fishery.

Carp management efforts in 2020 were preceded by several actions. In 2015-2016 carp barriers were installed at four strategic locations near the inlets and outlets of both lakes to prevent carp migration, overwintering, and spawning. In 2017-2020 carp were actively removed from the lakes using an MN DNR Conservation Partners Legacy grant. Additionally, a detailed assessment of the carp population, age structure, and spawning history is being completed. A long-term management plan for carp was prepared in 2019.

A grant to continue removing carp was secured for 2020-2022 from the MN Board of Water and Soil Resources Clean Water Fund. The project goal is to remove carp down to a goal of 100 kg/ha. This is being accomplished through a variety of techniques including box netting and seining.

Purpose: To improve water quality in Typo and Martin Lakes, as well as downstream waterways.

Location: Sunrise River Chain of Lakes including Linwood, Island, Martin, and Typo Lakes.

Results: In 2020 the following work was completed:

- 739 carp were removed from Martin Lake. 5,967 carp have now been removed from this lake since 2018.
- 30 carp were removed from Linwood Lake. This was the first year of efforts at this lake. The spring seine that captured these carp had a number of radio-tagged carp in the net indicating a large catch until the net had to be lifted over obstacles.
- Planned carp removals for 2021 which will include Linwood, Martin and Typo Lakes.
- Presented results at the annual Martin Lakers Association meeting.

ACD staff, volunteers and Carp Solutions staff with carp removed from Martin Lake (left image) by box net (right). Carp were removed with box traps.

Coon and Martin Lakes Stormwater Retrofits Project

Description: Installation of projects to treat stormwater that is otherwise discharged into Coon or Martin Lakes with little or no treatment. Projects were identified and ranked in stormwater assessment studies.

Purpose: To improve lake water quality.

Location: Coon and Martin Lakes.

Results: Outreach to owners priority project locations was conducted. Of more than a dozen approached, three were interested in construction. Those projects were designed, bid and constructed. Two stormwater pond renovations will reduce 3.31 lbs of phosphorus and 2,240 pounds of sediment loading to Martin Lake. One rain garden will reduce 1.25 lbs of phosphorus and 379 pounds of sediment loading to Martin Lake.

Project funding is from a 2019 State Watershed Based Implementation Funding grant to the Sunrise River WMO. Funding remains to install additional projects in 2021.

Photos of stormwater retrofit projects constructed in 2021.


Stormwater pond rehabilitation—Martin Lake


Stormwater pond rehabilitation—Martin Lake


Rain garden —Coon Lake

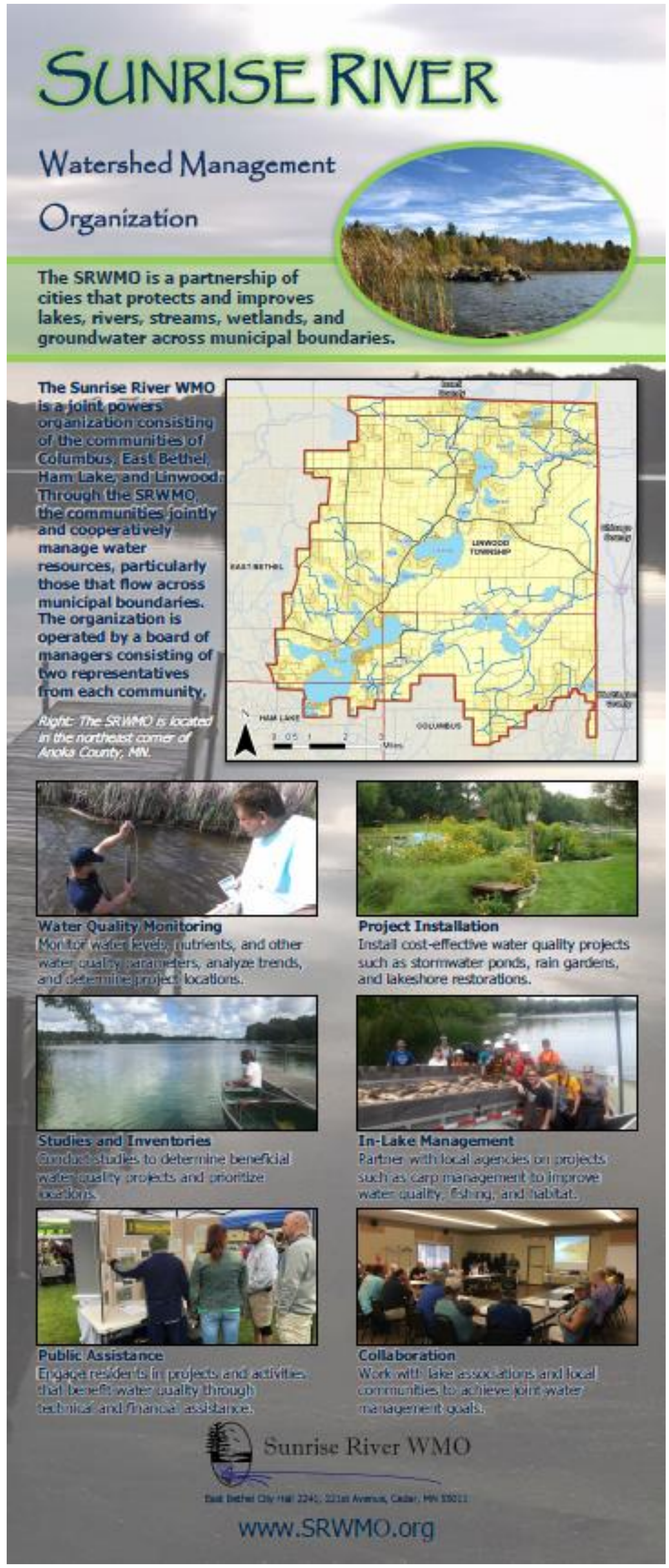
Booth/Display for Community Events

Description: Design a professional display with input from the SRWMO board.

Purpose: Highlight the SRWMO, projects and the types of natural resources found in the watershed.

Location: Watershed-wide

Results: ACD developed a professional display to be used at community events which showcases the SRWMO and the work being done in the watershed. Unfortunately, community events were cancelled in 2020 due to Covid-19, but the display is ready for subsequent use.



Secchi Transparency Lake Monitoring (Volunteer Coordination)

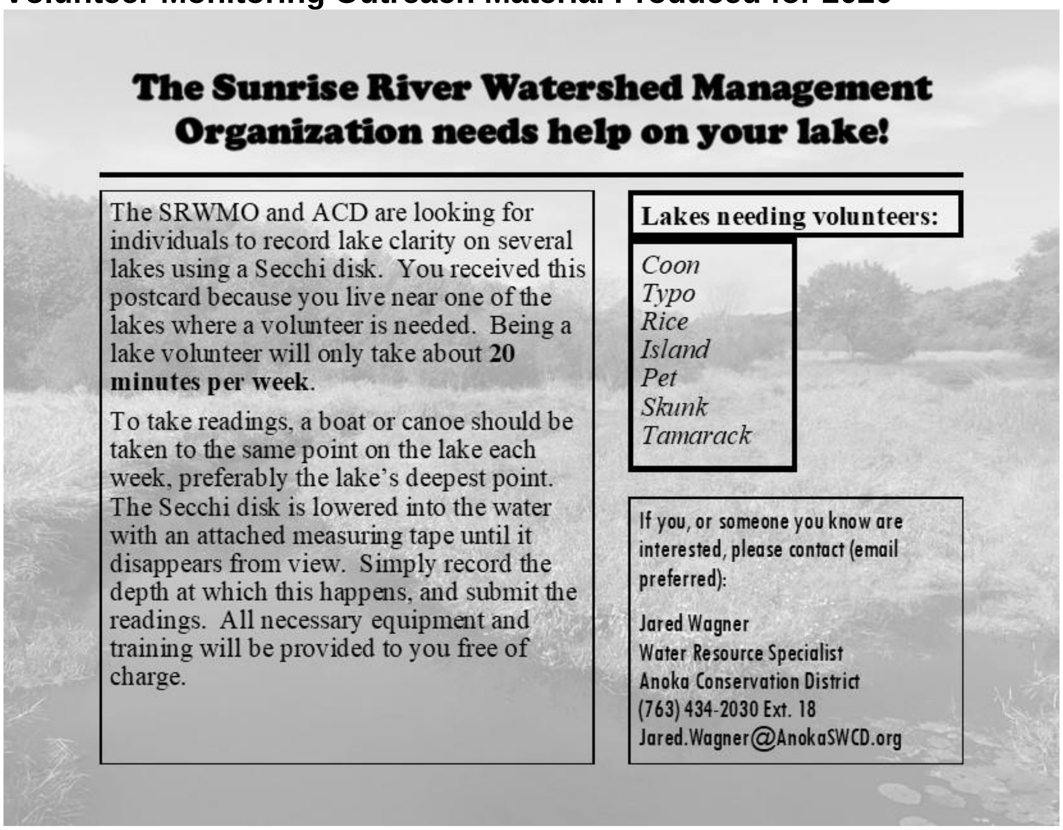
Description: Recruit local residents to participate in the State's volunteer Secchi monitoring program on lakes in the Sunrise Watershed.

Purpose: Get new volunteers enrolled in in the Citizen Monitoring Program.

Location: Coon, Typo, Rice, Island, Pet, Skunk, and Tamarack Lakes.

Results: ACD developed outreach material and conducted a targeted mailing based around 7 lakes in the watershed that are not currently enrolled in the Citizen Monitoring Program. Two new Secchi volunteers were established on Island and Typo Lake for the 2020 season, and both volunteers plan on participating through 2021. Additional outreach to secure volunteers at the remaining lakes is planned for 2021.

Volunteer Monitoring Outreach Material Produced for 2020



Annual Education Publications

Description: An annual newsletter article about the SRWMO is required by MN Rules 8410.010 subpart 4, and included in the SRWMO Watershed Management Plan.

Purpose: To improve citizen awareness of the SRWMO, its programs, accomplishments and water quality issues.

Location: Watershed-wide

Results: In 2020 the SRWMO contracted with the ACD to prepare its annual education publications. Materials, shown below, were prepared for community newsletters, lake association newsletters and the local newspaper.

Articles for community newsletters

Sunrise River
Watershed Management Organization

The Sunrise River Watershed Management Organization and its partners are releasing a new video titled "Our Lakeshore Connection." The video explains the inner workings of lakes and what lakeshore owners can do on their own property to improve lake health.

To watch, visit the "videos" tab at www.SRWMO.org.

The SRWMO is partnering with the Anoka Conservation District to offer technical help and grants to homeowners wishing to do projects that benefit an area lake or stream, such as correct shoreline erosion or install native plant buffers. For more information contact Jamie Schurbon at 763-434-2030 ext. 21.

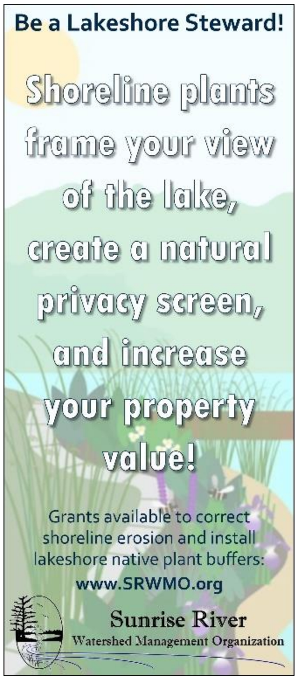
The SRWMO is a joint organization of the cities of East Bethel, Ham Lake, Columbus and Linwood Township for the purpose of managing local water issues. The SRWMO also participates in management of the larger Lower St. Croix Watershed (more info at www.lsc1w1p.org).

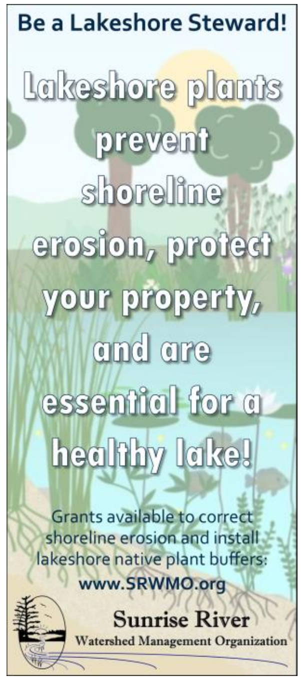
Septic System Fix Up Grants Available
Sunrise River Watershed Management Organization, www.SRWMO.org

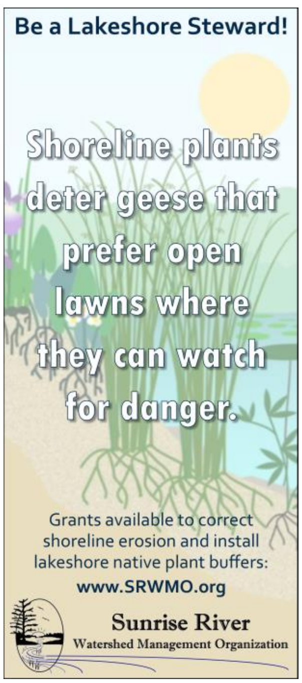
A properly functioning septic system provides effective treatment of wastewater, but if a system is neglected, it could cost thousands of dollars to repair and potentially contaminate local groundwater and surface water supplies, putting the health of your family and neighbors at risk.

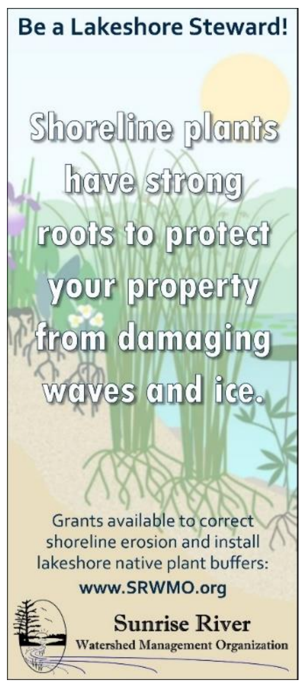
Septic system fix up grants are available that can pay for 80-90% of the cost of fixing or replacing a septic system. Applicants must meet low income criteria. To apply or learn more, contact Aaron Diehl at the Anoka Conservation District (763-434-2030 ext. 16 or aaron.diehl@anokaswcd.org).

Infographic series for lake association newsletters









Article for local newspapers

Who Owns the Water?

While paddling, my youngest son asked, "who owns the river?" As he has come to understand the world, everything is owned by someone. And that someone gets to say who else can enjoy it. And they may defend that thing from others. So who owns the water?

I emphatically replied, "you do!" And followed with the clarification, "not just you, but everyone. Can you believe all of this is partly yours?"

A lot of questions followed including "so I can go anywhere I want on the river?" Yes, pretty much. "What about lakes?" Yes, you are part owner of lakes too. You are completely welcome to enjoy them. "Can I do anything I want on the river?"

That last question is a little trickier, or perhaps a trick hoping I'll keep rolling with "yes" answers. The answer involves the word youngsters dread most: Sharing. Our waters are a shared resource. We care for them together. While we do have agencies that manage natural resources, they are in some large part trying guiding the rest of us "owners." Managing water is tricky because the waterbody can't be managed on its own. Lands drain to and affect the water.

It would seem that shoreline owners are the most important stewards of lakes and rivers based on proximity. Their actions can indeed make the shared resource better for all, or consume or degrade it. It's easy to find examples. We paddled past a shoreline full of trees and wildflowers along the bank – an owner that used what could have been manicured yard to add to the wildness and quietness of river.

I'm also reminded of another kid question, "where does the water go after it enters the gutter at the side of the street." Sometimes it goes to a stormwater pond or other place designed to at least partially clean it up, and then on to a river, stream or wetland. Or, sometimes it just goes straight to the waterbody. There are rural equivalents where water that starts far away reaches a lake or stream.

It turns out, we'll all shoreline owners in a sense. No matter where we live, water runs off to rivers, lakes, and groundwater. Responsible use of chemicals and fertilizers, preventing erosion, and improving habitat all add to, or detract from, our waters. Collectively, small actions make a big difference.

Many towns closely identify as being proudly in proximity to a waterbody. City of Forest Lake. Linwood Township (which contains Linwood Lake). Sunrise (on the Sunrise River). North Branch (on the North Branch of the Sunrise River). Cambridge (welcome signage says "City on the Rum River"). Taylors Falls. St. Croix Falls. You get the idea.

We identify with our waters. The quality and cleanliness of a waterbody is a mirror of our lands that drain to it. Seemingly accepting the lesson faster than most of us adults, during a brief stop on our paddling trip the youngest member of our group tossed some trash he found into his kayak. "If this is my river, I'd rather it be clean."

SRWMO Website

Description: The Sunrise River Watershed Management Organization (SRWMO) contracts the Anoka Conservation District (ACD) to maintain a website about the SRWMO and the Sunrise River watershed.

Purpose: To increase awareness of the SRWMO and its programs. The website also provides tools and information that helps users better understand water resources issues in the area. The website serves as the SRWMO's alternative to a state-mandated newsletter.

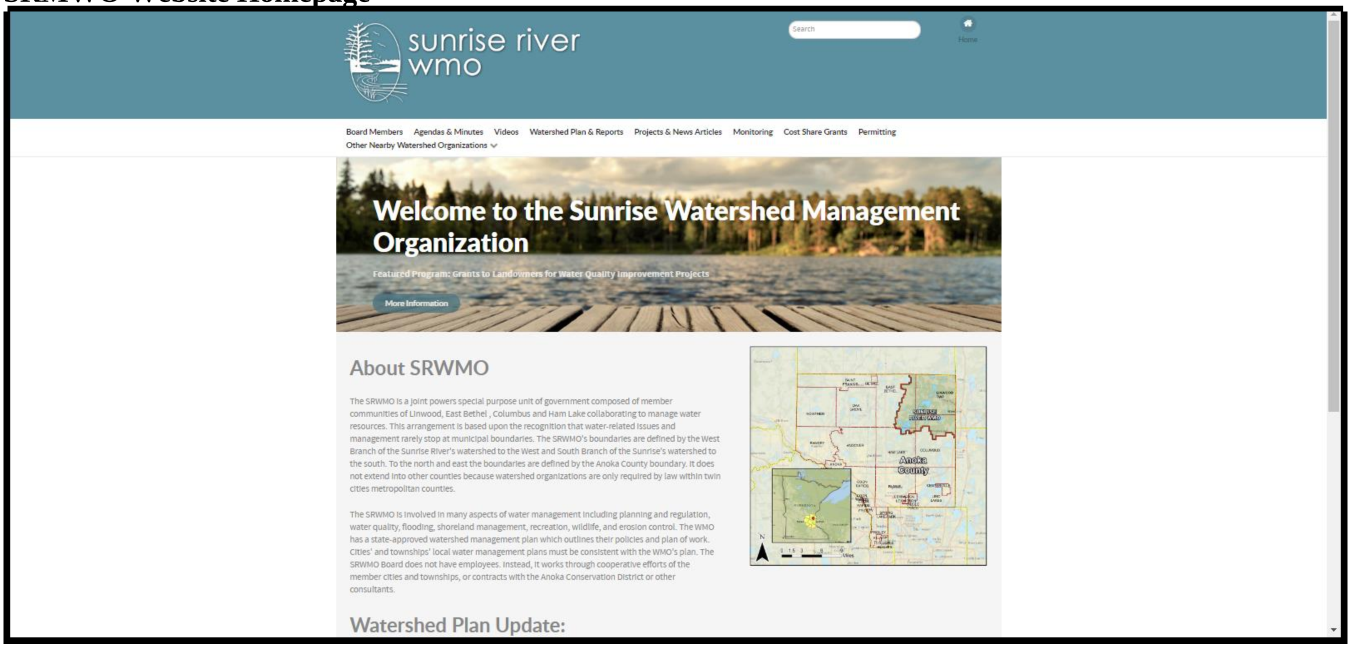
Location: www.SRWMO.org

Results: In 2020 routine SRWMO website updates were performed. The new website includes:

- Directory of board members,
- Meeting minutes and agendas,
- Watershed management plan and annual reports,
- Descriptions of work that the organization is directing,
- Highlighted projects,
- Informational videos,
- Maps of the URRWMO.

The website is regularly updated throughout the year.

SRMWO Website Homepage



Grant Searches and Applications

Description: The Anoka Conservation District (ACD) partners with the SRWMO for the preparation of grant applications. Several projects in the SRWMO Watershed Management Plan need outside funding in order to be accomplished.

Purpose: To provide funding for high priority local projects that benefit water resources.

Results: In 2020 the SRWMO pursued several grants and positioned itself for others. They included:

1. **A MPCA grant for $25,447 was secured to fix up failing septic systems** for low-income homeowners. The Anoka Conservation District holds this grant, which must be used county-wide. In the SRWMO since 2018 this program fixed septic systems at Martin, Fawn, and Coon Lakes.
2. **Lower St. Croix 1W1P Watershed Based Funding for $1,236,531.** This non-competitive State grant funds projects in the SRWMO Watershed Management Plan, the Lower St. Croix One Watershed One Plan (1W1P) and a few other eligible plans. The SRWMO participated in developing the grant work plan that includes funding for subwatershed assessments studies (Linwood Lake is a candidate in the work plan), internal loading analysis (Martin & Linwood Lakes), wetland restoration (Ditch 20 draining to Typo Lake) and public outreach programming serving the SRWMO area. Exact project sites and funding amounts are still being determined.

Since 2014, the following grants have been secured for SRWMO projects though the assistance of the Anoka Conservation District:

2014 Martin and Typo Lake Carp Barriers, site 2	MN DNR CLP	$ 35,770
2014 Martin and Typo Lake Carp Barriers, sites 1,3,4	MN DNR CLP	$399,983
2014 Coon Lake Area Stormwater Retrofits	BWSR CWF	$ 42,987
2015 Ditch 20 Wetland Restoration Feasibility Study	BWSR CWF	$ 72,400
2017 Martin and Typo Lake Carp Harvests	MN DNR CLP	$ 99,000
2017 Septic System Fix Up Fund*	MPCA	$ 23,040
2018 Watershed Based Funding	BWSR WBF	$156,750
2018 Septic System Fix Up Fund*	MPCA	$ 27,055
2019 Septic System Fix Up Fund*	MPCA	$ 40,000
2019-20 Surface Water Monitoring Grant, Sunrise R	MPCA	$ 5,102
2019 Sunrise River Chain of Lakes Carp Mgmt	BWSR CWF	$148,000
2020 Septic System Fix Up Fund*	MPCA	$ 25,447
2020 Lower St. Croix Watershed Based Funding	BWSR WBIF	$ TBD
	TOTAL	$1,075,534

*Septic system fix up funds are available county-wide. Only the amount used in the SRWMO is reported.

SRWMO Annual Report to BWSR and State Auditor

Description: The Sunrise River Watershed Management Organization (SRWMO) is required by law to submit an annual report to the Minnesota Board of Water and Soil Resources (BWSR), the state agency with oversight authority. This report consists of an up-to-date listing of SRWMO Board members, activities related to implementing the SRWMO Watershed Management Plan, the status of municipal water plans, financial summaries, and other work results. The SRWMO bolsters the content of this report beyond the statutory requirements so that it also serves as a comprehensive annual report to SRWMO member communities. The report is due annually 120 days after the end of the SRWMO's fiscal year (April 30th).

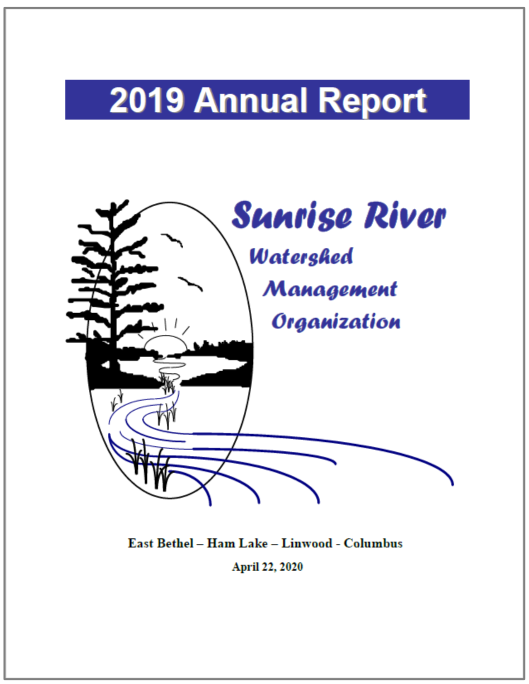
The SRWMO must also submit an annual financial report to the State Auditor. They accept unaudited financial reports for financial districts with annual revenues less than $185,000.

Purpose: To document progress toward implementing the SRWMO Watershed Management Plan and to provide transparency of government operations.

Locations: Watershed-wide

Results: Anoka Conservation District (ACD) assisted the SRWMO with preparation of the annual Sunrise River WMO Annual Report. ACD drafted the report and cover letter. After SRWMO Board review the final draft was forwarded to BWSR. A sufficient number of copies of the report were sent to each member community to ensure that each city council person and town board member would receive a copy. The report is available to the public on the SRWMO website.

Cover



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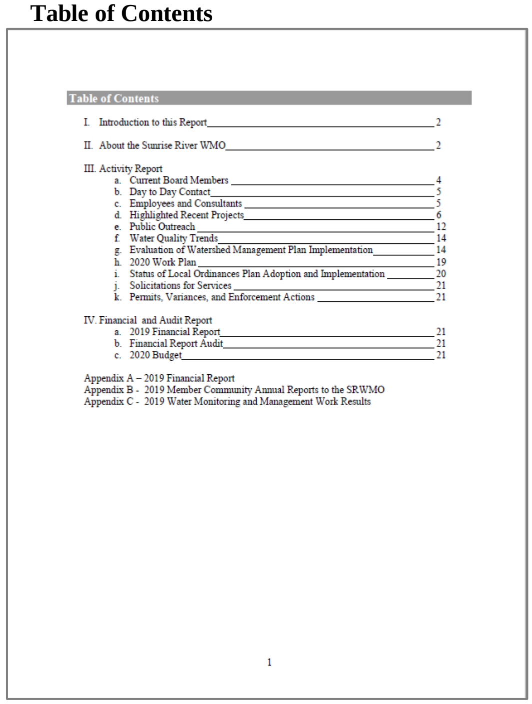

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On-call Administrative Services

Description: The Anoka Conservation District Watershed Projects Manager provides limited, on-call administrative assistance to the SRWMO. Tasks are limited to those defined in a contractual agreement.

Purpose: To ensure day-to-day operations of the SRWMO are attended to between regular meetings.

Results: In 2020 administrative assistance provided to the SRWMO by the Anoka Conservation District included:

- Prepared board meeting packets. Facilitated meetings and meeting planning. Set up and hosted online meetings when necessary.
- Recruited a new Recording Secretary. Took meeting minutes until during the interim. Reviewed each month's minutes.
- Prepared a draft 2021 budget for the SRWMO and subsequent revisions.
- Ordered and facilitated an audit-like agreed upon procedures review with an auditor.
- Prepared financial management policies for board approval, as recommended by the auditor.
- Addressed financial and budgeting concerns from Ham Lake, including multiple meetings.
- Provided Columbus with data for several different cost-splitting scenarios amongst member communities.
- Responded a public information request for SRWMO finances from a company who apparently develops and sells marketing lists.
- Worked with the East Bethel Finance Director to update the SRWMO's ledger and incorporate tracking of an undesignated reserve fund.
- Brought two cost share grant applications to the SRWMO board for consideration – a Coon Lakeshore restoration and rain garden at Linwood Elementary School.
- Reviewed community ordinances for consistency with SRWMO standards. Follow-up continues in order to bring ordinances up to speed.
- Reviewed and provided recommended SRWMO actions on community local water plans.
- Reviewed a jurisdictional boundary adjustment proposal from the Rice Creek Watershed District.
- Created a new template for city reporting to the SRWMO. Solicited and received annual reports.
- Completed a risk assessment process with the SRWMO's insurer.
- Met with the DNR and County Highway Department to lobby for repair of the Linwood Lake outlet – a task in the SRMWO Plan.
- Fielded questions from board members on a variety of issues affecting the SRWMO.
- Represented the SRWMO at staff level meetings of the Lower St. Croix One Watershed One Plan. Reported back to the SRWMO board, including facilitating discussion about implementation organizational arrangements (JPC vs JPE).
- Fielded permitting questions from the county highway department and builders.

Recommendations

- **Implement the SRWMO Watershed Management Plan that was approved in 2019.** The plan reflects the latest science and includes schedules for various projects.
- **Request Watershed Based Funding from the Lower St. Croix One Watershed, One Plan group.** Highest priority projects for which there is funding include a Linwood Lake subwatershed assessment study, wetland restoration at Ditch 20, and internal loading study for Linwood or Martin Lake.
- **Continue carp removals at Martin and Typo Lakes and begin carp management at Linwood Lake.** A State Clean Water Fund grant will support this work in 2020-2022.
- **Collaborate with the Anoka County Outreach Coordinator.** Modest SRWMO funding can serve as match for WBIF or other funding which results in more work in the SRWMO.
- **Continue installation of stormwater retrofits around Coon and Martin Lakes** where completed studies have identified and ranked projects. The grant expires in Dec. 2021.
- **Update the SRWMO joint powers agreement** to address out of date material and the lack of a dispute resolution mechanism.
- **Continue prioritizing strategic water quality monitoring** to assess baseline conditions, diagnose problems and determine the effectiveness of new water quality projects. The data help with strategically implementing grant funds and local funds to provide the largest water quality benefit possible at the lowest cost.
- **Promote Septic System Fix-up Grants to landowners,** particularly in shoreland areas.
- **Bolster lakeshore landscaping education efforts.** The SRWMO Watershed Management Plan sets a goal of three lakeshore restorations per year. Lakeshores were mapped in 2019 and 2020 by the Anoka Conservation District so that future outreach can be targeted.
- **Replenish the SRWMO's cost share grant fund.** After two funded projects in 2020, approx. $1,300 remains.