Excerpt from the
2020 Water Almanac
Chapter 3: Upper Rum River Watershed

Prepared by the Anoka Conservation District

Chapter: 3 Upper Rum River Watershed

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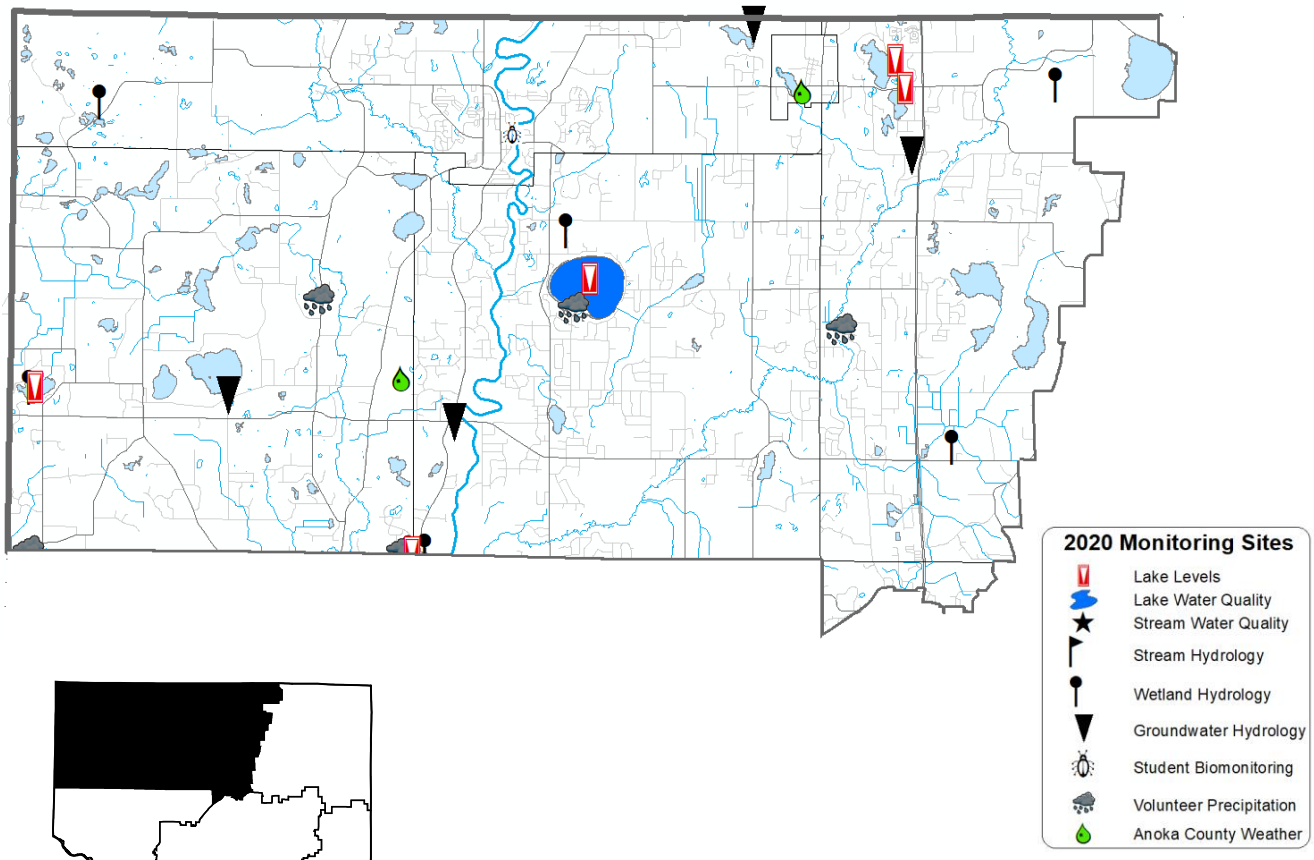
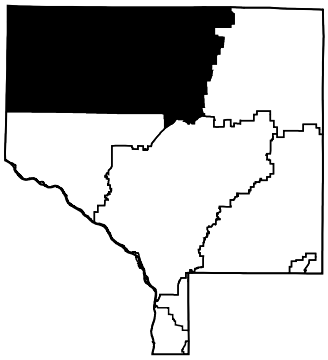




Lake Levels

Partners: URRWMO, ACD, MN DNR, volunteers

Description: Weekly water level monitoring in lakes. The past five years and twenty-five years are illustrated below, and all historical data are available on the Minnesota DNR website using the "LakeFinder" feature (https://www.dnr.state.mn.us/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.

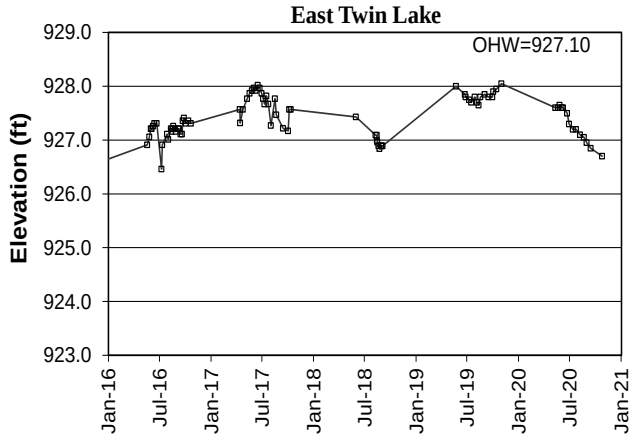
Locations: East Twin Lake, Lake George, Rogers Lake, Minard Lake

Results: Lake levels were measured by volunteers throughout the 2020 open water season. Lake gauges were installed and surveyed by the Anoka Conservation District and MN DNR. In 2020, lake levels started near average and declined throughout the season. The rebound often seen in the fall was not observed. This is likely due to infrequent rain events throughout the season and the lowest annual total precipitation since 2012.

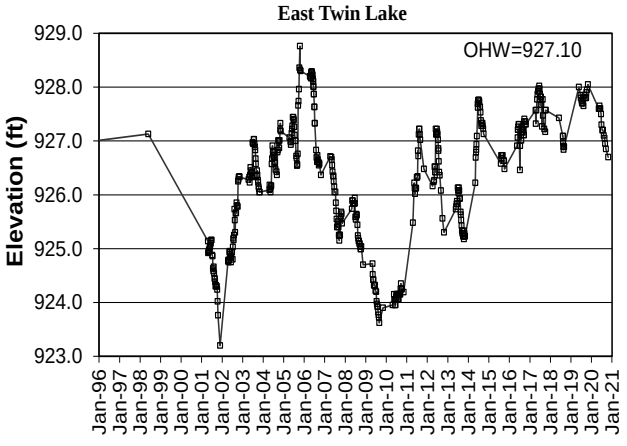
All lakes recorded lower water levels on average than in 2019 but were similar to averages observed throughout the past 5 years. Water levels on Lake George reached its lowest level since 2013 and Rogers Lake since 2015.

All lake level data can be downloaded from the MN DNR website's Lakefinder feature. 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. All lakes monitored were lower than the OHW for much of the monitoring season.

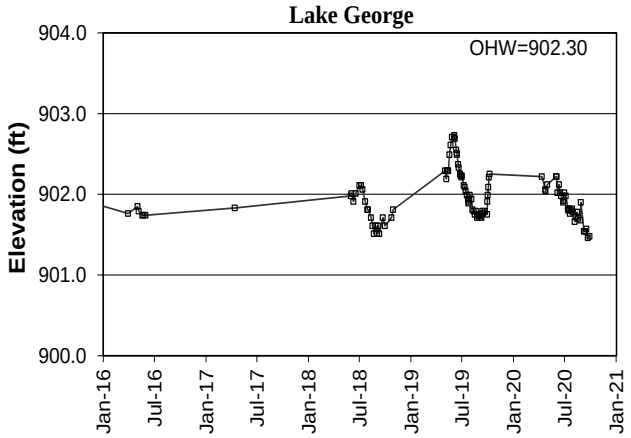
East Twin Lake Levels – last 5 years



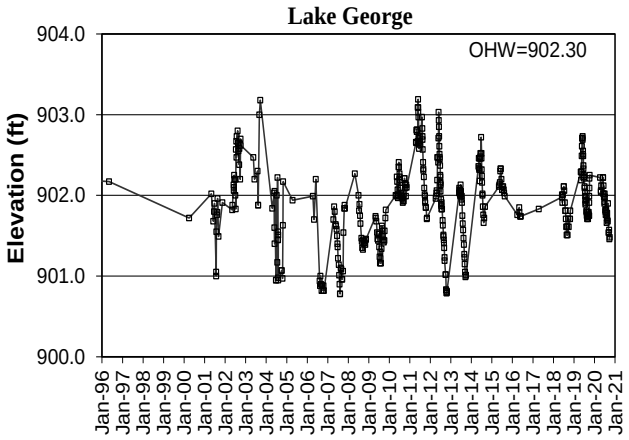
East Twin Lake Levels – last 25 years



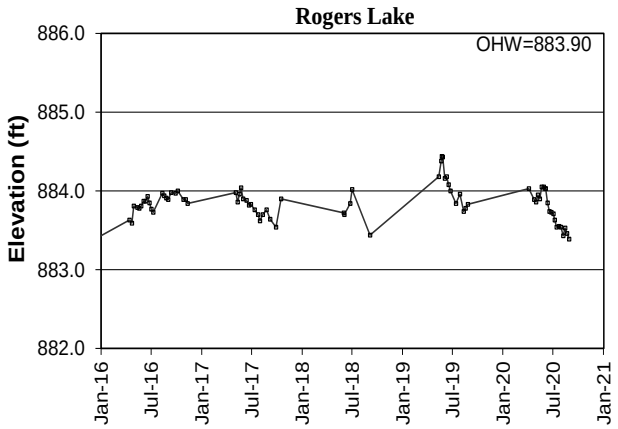
Lake George Levels– last 5 years



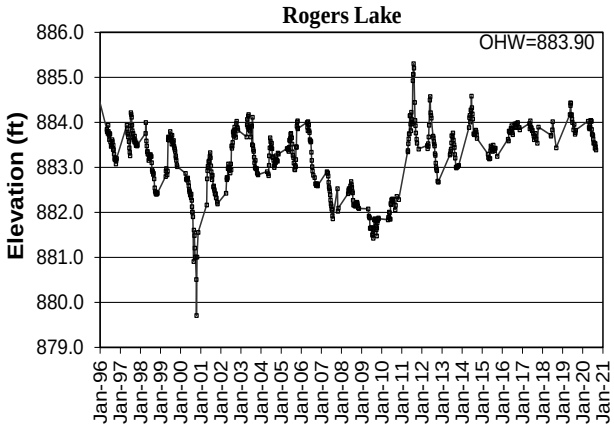
Lake George Levels – last 25 years



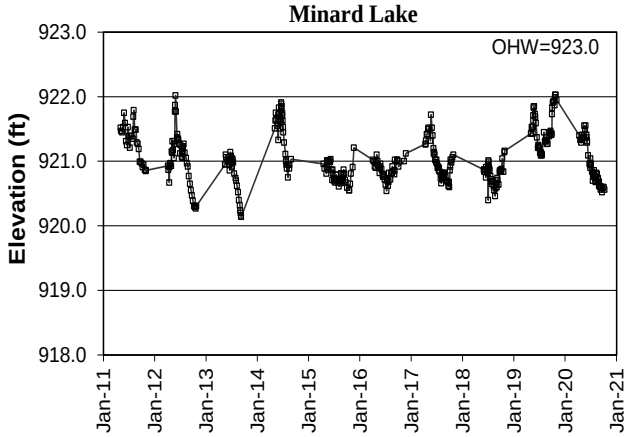
Rogers Lake Levels – last 5 years



Rogers Lake Levels – last 25 years



Minard Lake Levels – last 10 years



Lake	Year	Average	Min	Max
Rogers	2016	883.85	883.59	884.00
	2017	883.81	883.54	884.04
	2018	883.74	883.44	884.02
	2019	884.08	883.74	884.44
	2020	883.76	883.39	884.05

Lake	Year	Average	Min	Max
George	2015	902.14	901.99	902.33
	2016	901.77	901.74	901.85
	2018	901.79	901.51	902.11
	2019	902.12	901.71	902.73
	2020	901.86	901.46	902.22

Lake	Year	Average	Min	Max
East Twin	2016	927.17	926.46	927.41
	2017	927.67	927.17	928.02
	2018	927.00	926.84	927.43
	2019	927.83	927.65	928.05
	2020	927.28	926.70	927.65

Lake	Year	Average	Min	Max
Minard	2016	927.17	926.46	927.41
	2017	921.00	920.60	921.72
	2018	920.80	920.40	921.16
	2019	921.50	921.09	922.03
	2020	920.94	920.52	921.55

Lake Water Quality

Partners: ACD, Lake George LID and Conservation Club, URRWMO

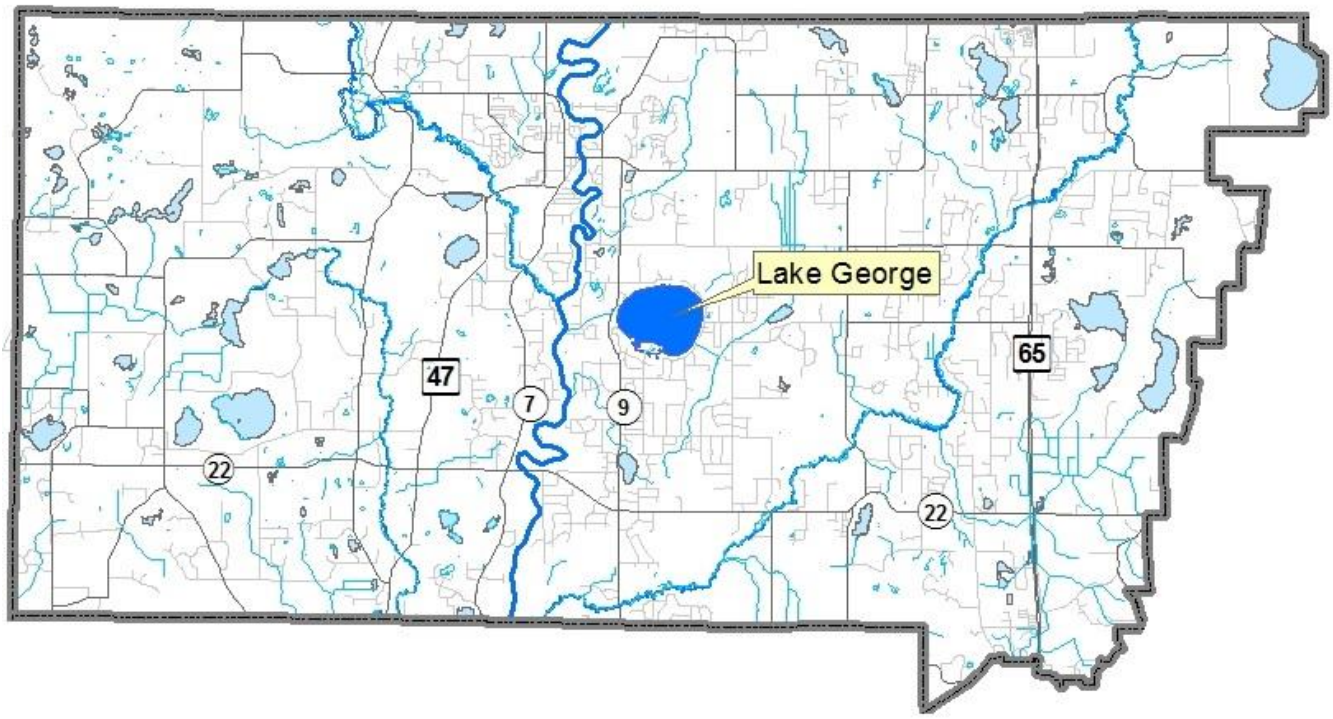
Description: May through September, every-other-week, monitoring is conducted for the following parameters: total phosphorus, chlorophyll-a, Secchi transparency, dissolved oxygen, turbidity, temperature, Specific Conductivity, pH, and salinity.

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

Locations: Lake George

Results: Detailed data for Lake George are provided on the following pages, including summaries of historical conditions and trend analysis. Previous years' data are available at the MPCA's electronic data access website. Refer to Chapter 1 for additional information on interpreting the data and on lake dynamics.

Upper Rum River Watershed Lake Water Quality Monitoring Sites



Lake George
City of Oak Grove, Lake ID # 02-0091

Background

Lake George is located in north-central Anoka County. The lake has a surface area of 535 acres with a maximum depth of 32 feet (9.75 m). Public access is from Lake George County Park on the lake's north side, where there is both a swimming beach and boat launch. About 70% of the lake is surrounded by homes; the remainder is county parkland. The watershed is mostly undeveloped or vacant, with some residential areas, particularly on the lakeshore and in the southern half of the watershed.

2020 Results

In 2020, Lake George had excellent water quality for this region of the state (NCHF Ecoregion), receiving an overall A letter grade for the third year in a row. Secchi transparency individually earned a B grade. These results are similar to what was recorded before 2009, when the majority of monitoring years scored an A. Since 2009 the majority of monitoring years have scored a B letter grade. The driving factor being declining secchi transparency.

Results for individual water quality parameters varied. Total phosphorus in 2020 averaged 20.3 µg/L, the lowest since 2005. Secchi transparency was high early in the season, but dropped to a low of 5.0 feet in early September. Average Secchi transparency was 9.24 feet, which was more than a half a foot improvement from 2019. Chlorophyll-a (Cl-a) averaged 8.0 µg/L, which was similar to the levels of previous years. Cl-a, TP and transparency were all poorest in early September, but throughout the season all three parameters were better than the State water quality standard for deep lakes in this region.

Although Lake George water quality remains better than State standards and is ranked good for a metro-county lake, simply adhering to these standards isn't the goal for such an important water body. Decline of Lake George's Secchi transparency has been a cause for concern in recent years with a now twenty-year trend of decline bearing out in statistical analyses. The last three years have shown improving clarity but these results are most likely linked to the below average precipitation occurring in 2018 and 2020. 2019 had the highest annual rainfall on record for the state, but secchi averages remained improved due to higher readings being recorded at the beginning of the season.

Trend Analysis

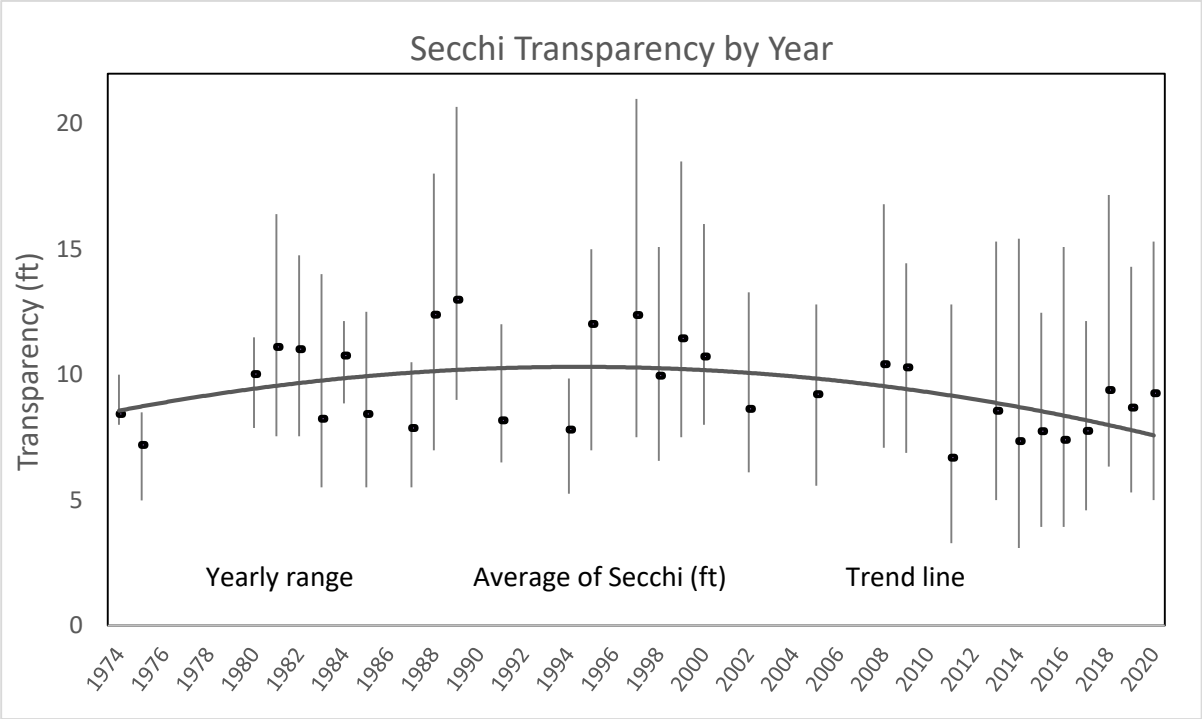
Over thirty years of water quality data have been collected by the Metropolitan Council (between 1980 and 2009) and the Anoka Conservation District (1997, 1999, 2000, 2002, 2005, 2008, 2011, 2013- 2020). A broad analysis of overall water quality that simultaneously considers TP, Cl-a and Secchi transparency did not find a statistically significant trend looking at all years of data (repeated measures MANOVA with response variables TP, Cl-a, and Secchi transparency, $p=0.46$). When parameters are isolated for individual analysis, there is no significant change in Cl-a or TP. However, during this same period there is a statistically significant trend of declining Secchi transparency ($p=<0.01$). When sampling years' 1995-2020 are isolated declining Secchi transparency again shows a statistically significant decline ($p<0.05$).

When we isolate just the last 10 years (2011-2020) we do see a statistical significant trend of improving water quality when looking at all parameters (repeated measures MANOVA with response variables TP, Cl-a, and Secchi transparency, $p<0.05$). When parameters are isolated for individual analysis both TP and Secchi transparency have improved on a statistically significant basis ($p<0.05$).

Lake George

CITY OF OAK GROVE, LAKE ID # 02-0091

Lake George Secchi transparency trend: Includes years with partial datasets not covering all open water months. Those years are excluded from ACD's statistical analysis and graphs later in the document.



Discussion

Lake George remains one of the clearest of the Anoka County lakes, but a trend of declining Secchi transparency from the mid-1990s through 2017 caused concern. Lake George is a highly valued lake due to its recreational opportunities and ecological quality. The lake has a large park, many lakeshore homes, and a notably diverse plant community (most metro area lakes have 10-12 different aquatic plant species; Lake George is home to 24).

In 2018 an intensive study of the lake and its watershed titled "Lake George Water Quality Improvement Assessment" was completed. Work from 2016-2018 included monitoring of tributaries, modeling, and evaluation of projects to correct the transparency decline. The work focused on the watershed, and a "phase 2" study of in-lake processes may occur in the future. The study was funded by the Lake George Improvement District, Lake George Conservation Club, Anoka Conservation District, and a State Clean Water Fund grant.

The aforementioned study provides some insight into the causes of transparency decline. While a number of factors may play a role, an increase in the average amount of precipitation falling is the most significant driver identified. Water Years (Oct. 1 – Sept. 30) that are wetter than the 100-year 90th percentile result in increased volumes of runoff and nutrients into the lake from surrounding tributaries, and the lake has poorer clarity in those years, or in immediately subsequent years.

These "wet" years were more frequent during the period that lake transparency has declined. Six out of sixteen years from 2001 to 2017 were "wet" with water year precipitation above the historical 90th percentile, with 1999 reaching just under the 90th percentile mark. Additionally, four of these six wet years occurred during the sustained low Secchi transparency period of 2010 through 2017.

Water year precipitation returned to normal levels in 2017 and 2018, causing a temporary rebound in average Secchi transparency during the most recently monitored years. The 2019 calendar year was the wettest on record. Secchi results in 2019 were only slightly poorer than the improved 2018 results, but that average was likely skewed by much higher readings earlier in the season, with poorer readings later. The correlation between precipitation and Secchi clarity was again observed in 2020. Total annual precipitation in 2020 was the lowest since 2012 which resulted in again improved Secchi clarity throughout the year. It is likely that a wet 2020 following the wet 2019 would have caused clarity to further decline.

There is concern that climate change and increased runoff from development in the watershed will drive poorer water quality in Lake George into the future. Among the recommendations of the 2018 study was replacing the deteriorating Ditch 19 weir just east of Lake George which is an important hydrological control for the lake. The weir was replaced in early 2020, and this project may have offered some additional clarity benefit right away. This replaced outlet structure should result in reduced nutrient delivery to the lake during wet years, and the broader benefits of restoring lake hydrology and enhancing game fish spawning opportunities. Other actions identified in the watershed study include agricultural best practices, an iron-enhanced sand filter, public education, lakeshore restorations, enhanced stormwater standards for new developments in the lakeshed and others. While certain tributary subwatersheds do generate more nutrients than others, and therefore deserve special consideration for projects, it is also noted that some of these subwatersheds drain through large wetlands with some apparent pollutant removal ability which must be considered when siting projects. Projects nearest the lake are favored because they treat a larger upstream area and don't duplicate treatment that might already be provided by certain wetlands.

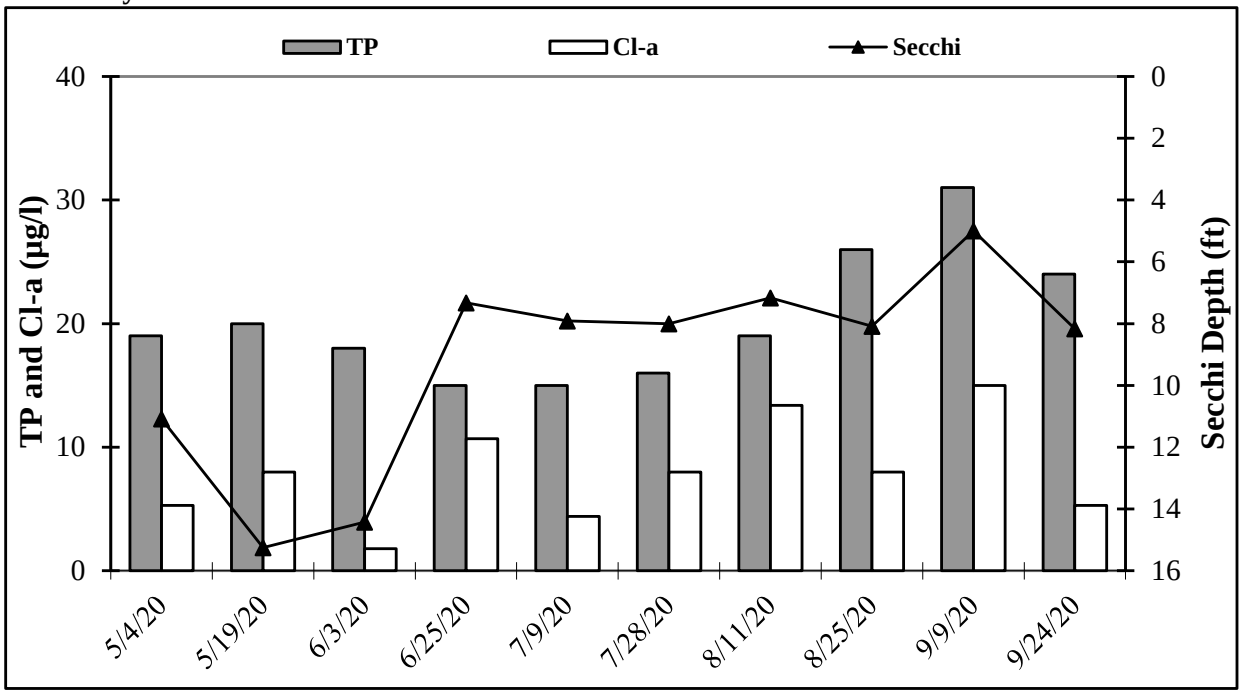
An additional concern for Lake George is noted in *the 2017 Rum River Watershed Fish-Based Lake IBI Stressor Identification Report* by the MN DNR. That report found Lake George's fish community was not impaired, but was one of special concern and deemed vulnerable. Lack of aquatic habitat and near-shore development disturbances were indicated as stressors. To help address this concern The Anoka Conservation District received a grant to implement lakeshore restoration projects on the lake in 2021-2022. These types of practices promote native lakeshore habitat while also reducing phosphorus loading into the lake.

Two exotic invasive plants are present in Lake George, curly-leaf pondweed and Eurasian water milfoil. The Lake George Improvement District and Lake George Conservation Club work to control these plants, and multiple years of localized treatments have occurred. In coordination with the MN DNR, the lake groups continually work to achieve control of these invasive plants without harming native plants or water quality. Water quality has been monitored immediately before and after herbicide treatments, and no obvious causal relationship between weed treatment and water quality was found.

Lake George

CITY OF OAK GROVE, LAKE ID # 02-0091

2020 Daily Results



2020 Median Values

pH		8.25
Specific Conductivity	mS/cm	0.21
Turbidity	NTU	7.35
D.O.	mg/l	9.40
D.O.	%	109.5
Temp	°F	72.89
Salinity	%	0.10
Cl-a	µg/L	8.00
T.P.	µg/l	19.00
Secchi	ft	8.04

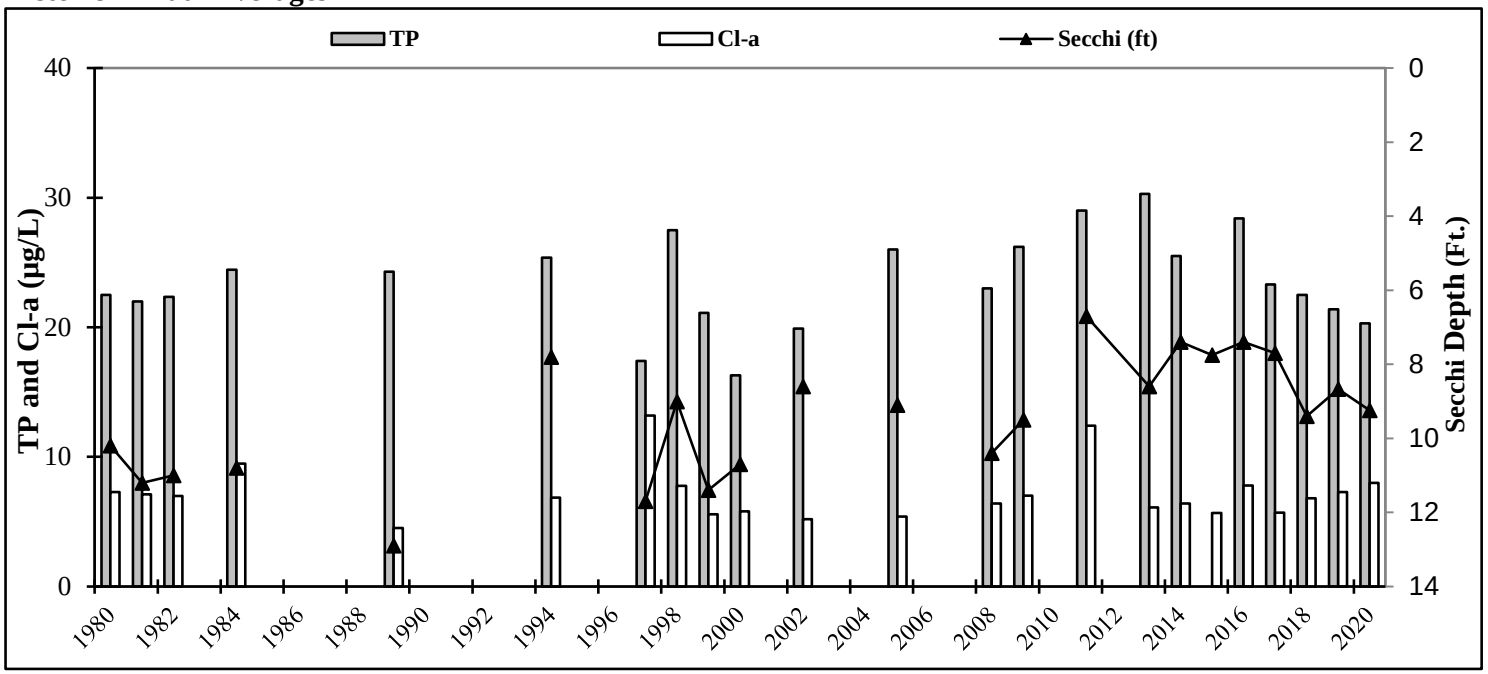
Lake George

2020 Water Quality Data

	Units	R.L.*	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	Average	Min	Max
			Time: 12:25	10:15	9:00	9:15	9:15	9:30	8:55	9:10	9:15	9:05			
pH		0.1	8.98	8.29	7.83	8.32	8.19	7.82	8.20	8.71	7.98	8.43	8.28	7.82	8.98
Specific Conductivity	mS/cm	0.01	0.211	0.214	0.215	0.210	0.208	0.206	0.204	0.202	0.203	0.203	0.208	0.202	0.215
Turbidity	NTU	1	0.00	4.70	12.40	16.30	15.70	7.300	13.90	4.20	7.40	2.20	8.52	0	16
D.O.	mg/l	0.01	11.04	9.68	10.78	9.40	7.95	8.22	9.28	9.40	8.17	10.14	9.41	7.95	11.04
D.O.	%	1	109.8	96.1	127.0	114.0	109.1	103.5	108.0	119.1	87.7	110.8	108.5	87.7	127.0
Temp.	°C	0.1	13.76	13.95	21.94	23.49	28.55	25.98	23.95	25.81	18.26	18.13	21.4	13.8	28.6
Temp.	°F	0.1	56.8	57.1	71.5	74.3	83.4	78.8	75.1	78.5	64.9	64.6	70.5	56.8	83.4
Salinity	%	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Cl-a	µg/L	1	5.30	8.0	1.8	10.7	4.4	8.0	13.4	8.0	15.0	5.3000	8.0	1.8	15.0
T.P.	mg/l	0.005	0.019	0.020	0.018	0.015	0.015	0.016	0.019	0.026	0.031	0.024	0.020	0.015	0.031
T.P.	µg/l	5	19	20	18	15	15	16	19	26	31	24	20.30	15	31
Secchi	ft		11.08	15.25	14.42	7.33	7.91	8.00	7.17	8.08	5.00	8.17	9.24	5.0	15.3
Secchi	m		3.38	4.65	4.40	2.23	2.41	2.44	2.19	2.46	1.52	2.49	2.8	1.5	4.6
Physical			1.0	1.0	2.0	2.0	1.0	2.0	2	2.0	1	1.0	1.5	1.0	2.0
Recreational			1.0	1.0	1.0	1.0	1.0	1.0	1	1.0	1	1.0	1.0	1.0	1.0

*reporting limit

Historic Annual Averages



Historical Report Card

Year	TP	Cl-a	Secchi	Overall
1980	A	A	A	**A**
1981	A	A	A	**A**
1982	A	A	A	**A**
1984	B	A	A	**A**
1989	B	A	A	**A**
1994	B	A	B	**B**
1997	A	B	A	**A**
1998	B	A	B	**B**
1999	A	A	A	**A**
2000	A	A	B	**A**
2002	A	A	B	**A**
2005	B	A	B	**B**
2008	B	A	A	**A**
2009	B	A	B	**B**
2011	B	B	C	**B**
2013	B	A	B	**B**
2014	B	A	B	**B**
2015	A	A	B	**A**
2016	B	A	B	**B**
2017	B	A	B	**B**
2018	A	A	B	**A**
2019	A	A	B	**A**
2020	A	A	B	**A**
State standards	40 µg/L	14 µg/L	1.4 meters	

2020 Aquatic Invasive Vegetation Mapping

Lake George
City of Oak Grove, Lake ID # 02-0091

Partners: Lake George LID, Lake George Conservation Club, MNDNR

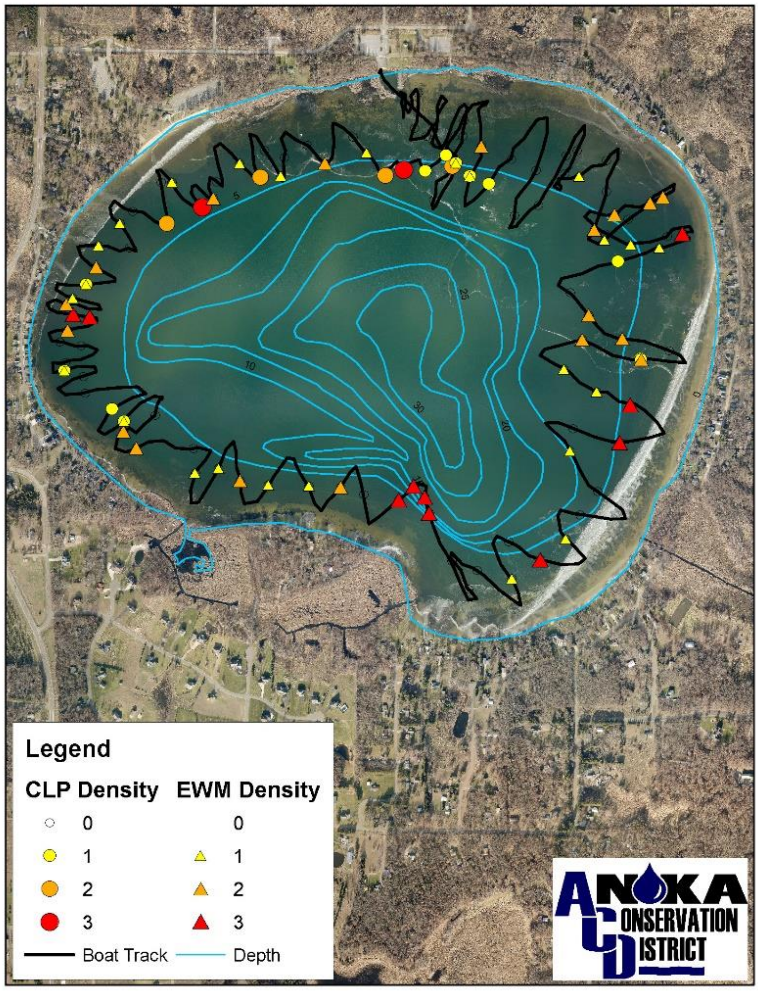
Description: The Anoka Conservation District (ACD) was contracted by the Lake George Lake Improvement District (LID) to conduct an aquatic invasive vegetation delineation.

Purpose: To map out the presence of Curly Leaf Pondweed (CLP) and Eurasian Water Milfoil (EWM) as required for MN DNR herbicide treatment permits. A goal was to map these invasive species as early as possible in the growing season to allow for herbicide treatment as early as possible for reduced impacts on native plants and lessened possible impacts on water quality.

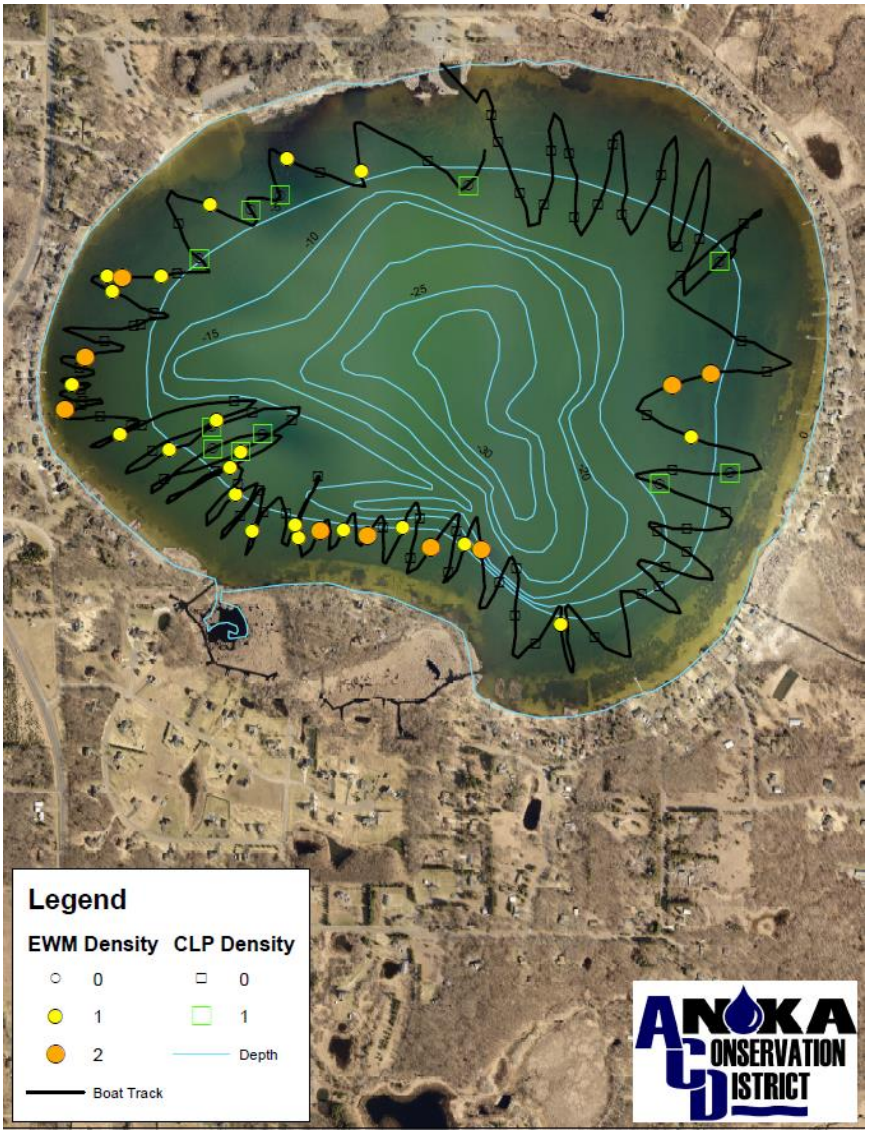
Locations: Lake George

Results: Maps presented below were delivered to the MN DNR and Lake George Improvement District within 48 hours of the field surveys. These survey points were reviewed by the MNDNR and helped direct herbicide treatment efforts.

May 4, 2020 Lake George Curly Leaf Pondweed (CLP) and Eurasian Water Milfoil (EWM) Survey



July 10, 2020 Lake George Curly Leaf Pondweed (CLP) and Eurasian Water Milfoil (EWM) Survey



Stream Water Quality – Biological Monitoring

Partners: St. Francis American Legion Post #622

Description: This program combines environmental education and stream monitoring. Under the supervision of the ACD staff, high school science classes collect aquatic macroinvertebrates from a stream, identify their catch to the family level, and use the resulting numbers to gauge water and habitat quality. These methods are based upon the knowledge that different families of macroinvertebrates have different water and habitat quality requirements. The families collectively known as EPT (Ephemeroptera, or mayflies; Plecoptera, or stoneflies; and Trichoptera, or caddisflies) are generally pollution intolerant. Other families can thrive in low quality water. Therefore, a census of stream macroinvertebrates yields information about stream health.

Purpose: To assess stream quality, both independently as well as by supplementing chemical data. To provide an environmental education service to the community.

Location: Rum River at Rum River North County Park

Results: Results for each site are detailed on the following pages.

Tips for Data Interpretation

Consider all biological indices of water quality together rather than looking at each alone, because each gives only a partial picture of stream condition. Compare the numbers to county-wide averages. This gives some sense of what might be expected for streams in a similar landscape, but does not necessarily reflect what might be expected of a minimally impacted stream. Some key numbers to look for include:

Families — Number of invertebrate families. Higher values indicate better quality.

EPT — Number of families of the generally pollution-intolerant orders Ephemeroptera (mayflies), Plecoptera (stoneflies), Trichoptera (caddisflies). Higher numbers indicate better stream quality.

Family Biotic Index (FBI) — An index that utilizes known pollution tolerances for each family. Lower numbers indicate better stream quality.

FBI	Stream Quality Evaluation
0.00-3.75	Excellent
3.76-4.25	Very Good
4.26-5.00	Good
5.01-5.75	Fair
5.76-6.50	Fairly Poor
6.51-7.25	Poor
7.26-10.00	Very Poor

Population Attributes Metrics

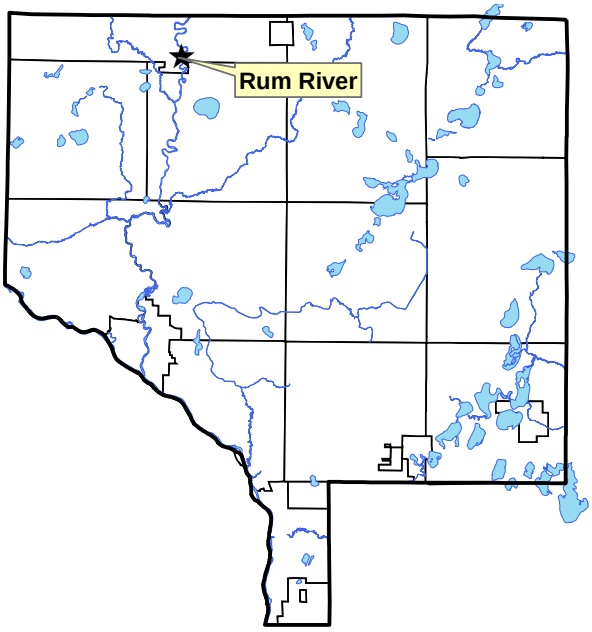
% EPT: This measure compares the number of organisms in the EPT orders (Ephemeroptera - mayflies: Plecoptera - stoneflies: Trichoptera - caddisflies) to the total number of organisms in the sample. A high percent of EPT is good.

% Dominant Family: This measures the percentage of individuals in the sample that are in the sample's most abundant family. A high percentage is usually bad because it indicates low evenness (one or a few families dominate, and all others are rare).

Biomonitoring

RUM RIVER

at Rum River North County Park, St. Francis



Last Monitored

By St. Francis High School in 2020

Monitored Since

2000

Student Involvement

150 students in 2020, approximately 1,500 since 2000

Background

The Rum River originates from Lake Mille Lacs, and flows south through western Anoka County where it joins the Mississippi River in the City of Anoka. Other than the Mississippi, this is the largest river in the county. In Anoka County the river has both rocky riffles as well as pools and runs with sandy bottoms. The river's condition is generally regarded as excellent. Portions of the Rum in Anoka County have a state "scenic and recreational river" designation.

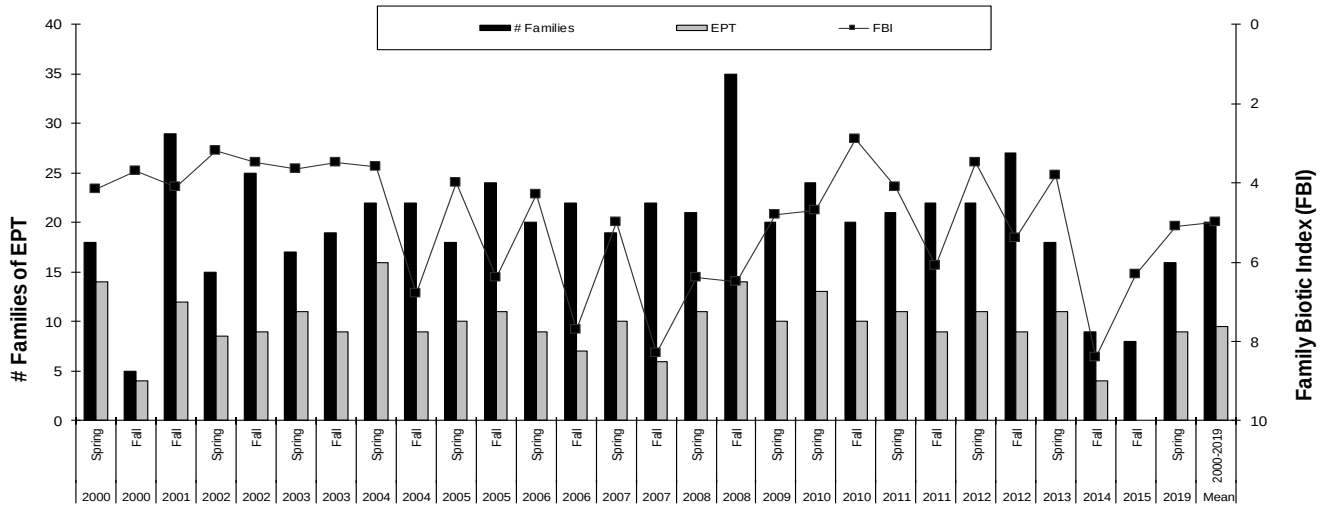
The sampling site is in Rum River North County Park. This site is typical of the Rum in northern Anoka County, having a rocky bottom with numerous pool and riffle areas.

Results

St. Francis High School classes monitored the Rum River in the spring of 2020, with ACD oversight and funding from the St. Francis American Legion. In, 2020 general biology classes performed a rapid bio-assessment activity of the River where we looked at types of organisms captured and gave a score based on general pollution sensitivity. Because there were so many classes, we did not collect the invertebrates for lab identification. Many of the student groups captured numerous EPT taxa, which are indicators of good water quality. Next year, we are planning to return to lab identification of invertebrates with college biology classes. Below are data from previous years.

Last year, in 2019, captures indicated a moderate-to-healthy ecological condition despite high water levels and fast flows which typically lower sampling success the students. Multiple years should cumulatively be considered when interpreting biomonitoring data. Water levels, weather, site conditions and differences in class sizes and student capabilities can all contribute to different results in any one year. Based on the multi-year dataset it appears that Rum River ecological health at this site is good.

Summarized Biomonitoring Results for Rum River North County Park, St. Francis (samplings by St. Francis High School and Crossroads Schools in 2002-2003 are averaged)



Biomonitoring Data for Rum River at Rum River North County Park, St. Francis

Data presented from the most recent five years. Contact the ACD to request archived data.

Table of most recent five years

Year	2012	2013	2014	2015	2019	Mean
Season	Fall	Spring	Fall	Fall	Spring	2000-2019
FBI	5.4	3.8	8.4	6.3	5.1	5.0
# Families	27	18	9	8	16	20.0
EPT	9	11	4	0	9	9.6
Date	27-Sep	20-May	24-Oct	22-Jul	19-May	
Sampled By	SFHS	SFHS	SFHS	4-H	SFHS	
Sampling Method	MH	MH	MH	MH	MH	
Mean # Individuals/Rep.	333	247.5	219	23	139	
# Replicates	1	2	1	1	1	
Dominant Family	veliidae	Baetiscida	Corixidae	Cambaridae	Siphlonuridae	
% Dominant Family	13.8	34.7	86.3	34.8	32.4	
% Ephemeroptera	34.2	54.1	3.7	0	46	
% Trichoptera	4.2	6.3	0.5	0.0	0	
% Plecoptera	11.1	30.3	2.3	0	18	

Discussion

Historically, both chemical and biological monitoring indicate the good water quality of this river. Poorer results in 2014 and 2015 may reflect varying site and sampling conditions rather than a shift in the biological community. Habitat is ideal for a variety of stream life, and includes a variety of substrates, plenty of woody snags, riffles, and pools. Taxa that are extremely sensitive to pollution are still being collected. Water chemistry monitoring done at various locations on the Rum River throughout Anoka County indicates that water quality is also good. Continued biological monitoring is recommended both as an education program and for long-term ecological condition monitoring.

Wetland Hydrology

Partners: URRWMO, ACD

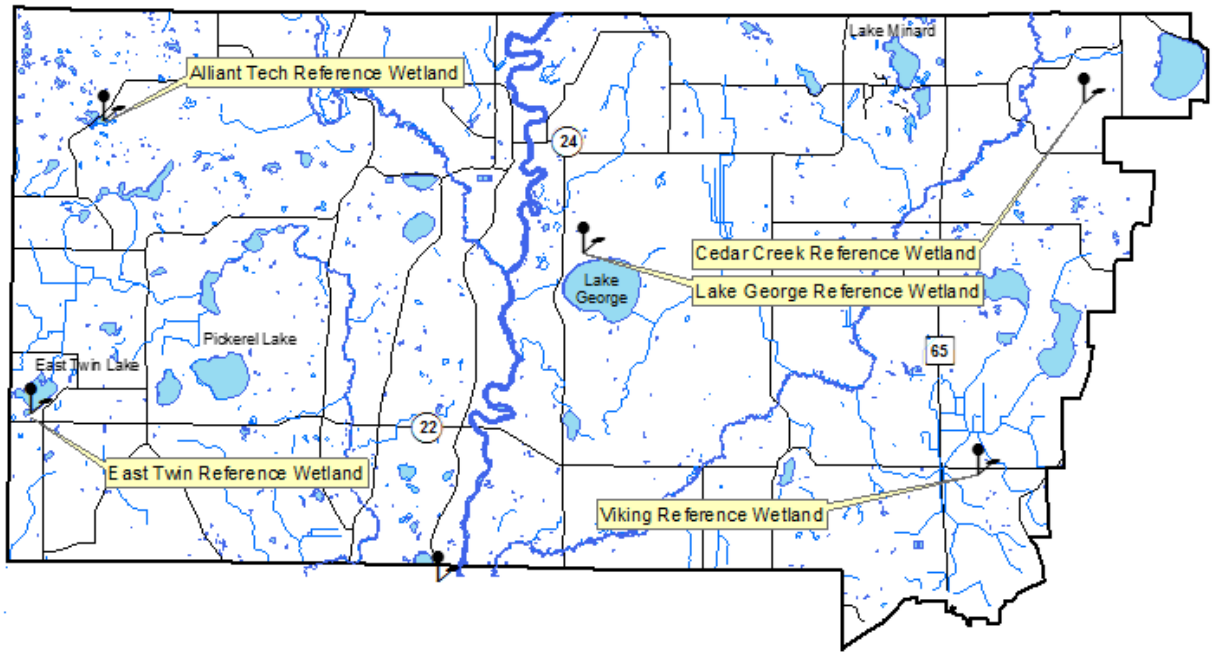
Description: Continuous groundwater level monitoring at a wetland boundary to a depth of 40 inches. Countywide, the ACD maintains a network of 23 wetland hydrology monitoring stations.

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: Alliant Tech Reference Wetland, Alliant Tech Systems property, St. Francis
Cedar Creek, Cedar Creek Natural History Area, East Bethel
East Twin Reference Wetland, East Twin Township Park, Nowthen
Lake George Reference Wetland, Lake George County Park, Oak Grove
Viking Meadows Reference Wetland, Viking Meadows Golf Course, East Bethel

Results: See the following pages. Raw data and updated graphs can be downloaded from www.AnokaNaturalResources.com using the Data Access Tool.

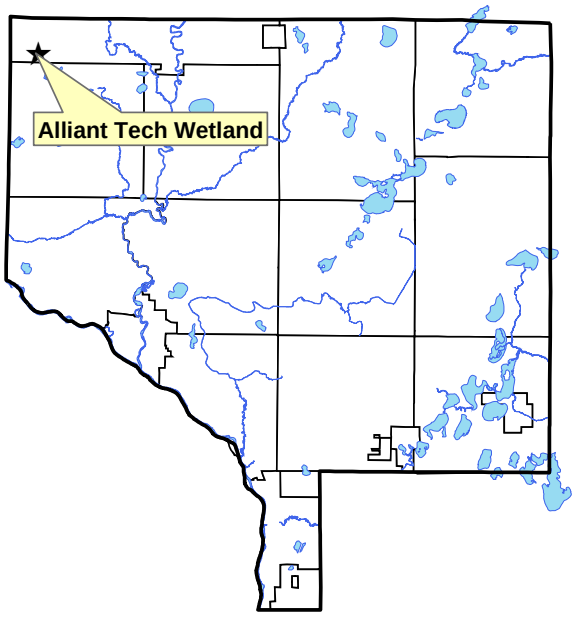
2020 Upper Rum River Watershed Wetland Hydrology Monitoring Site



ALLIANT TECH REFERENCE WETLAND

Alliant Techsystems Property, St. Francis

Site Information



Monitored Since: 2001

Wetland Type: 5

Wetland Size: ~12 acres

Isolated Basin? Yes

Connected to a Ditch? No

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
A	0-8	N2/0	Mucky loam	-
Bg	8-35	5y5/1	Sandy loam	-

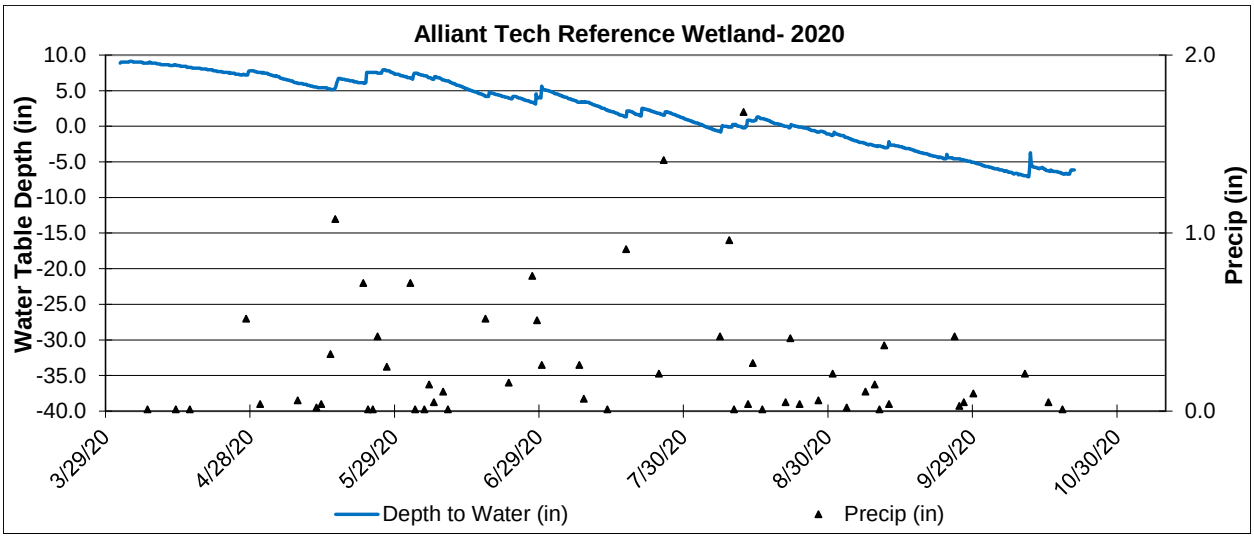
Surrounding Soils: Emmert

Vegetation at Well Location:

Scientific	Common	% Coverage
Carex Spp	Sedge undiff.	90
Lycopus americanus	American Bungleweed	20
Phalaris arundinacea	Reed Canary Grass	5

Other Notes: This wetland lies next to the highway, in a low area surrounded by hilly terrain. It holds water throughout the year, and has a beaver den.

2020 Hydrograph

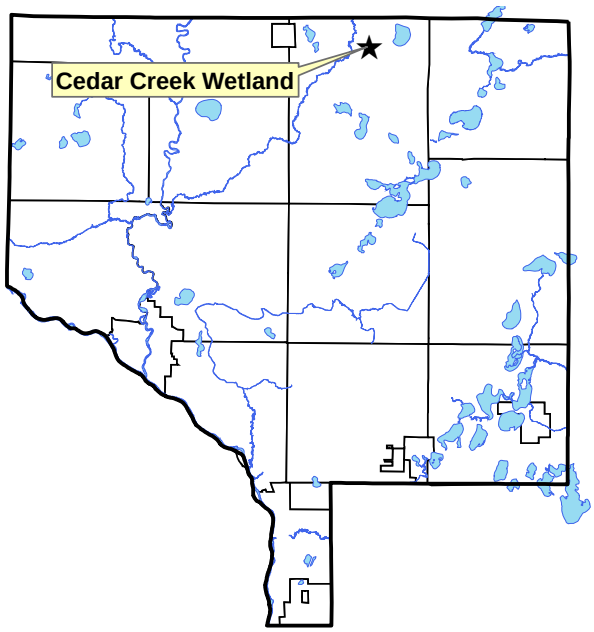


CEDAR CREEK REFERENCE WETLAND

Univ. of Minnesota Cedar Creek Natural History Area, East Bethel

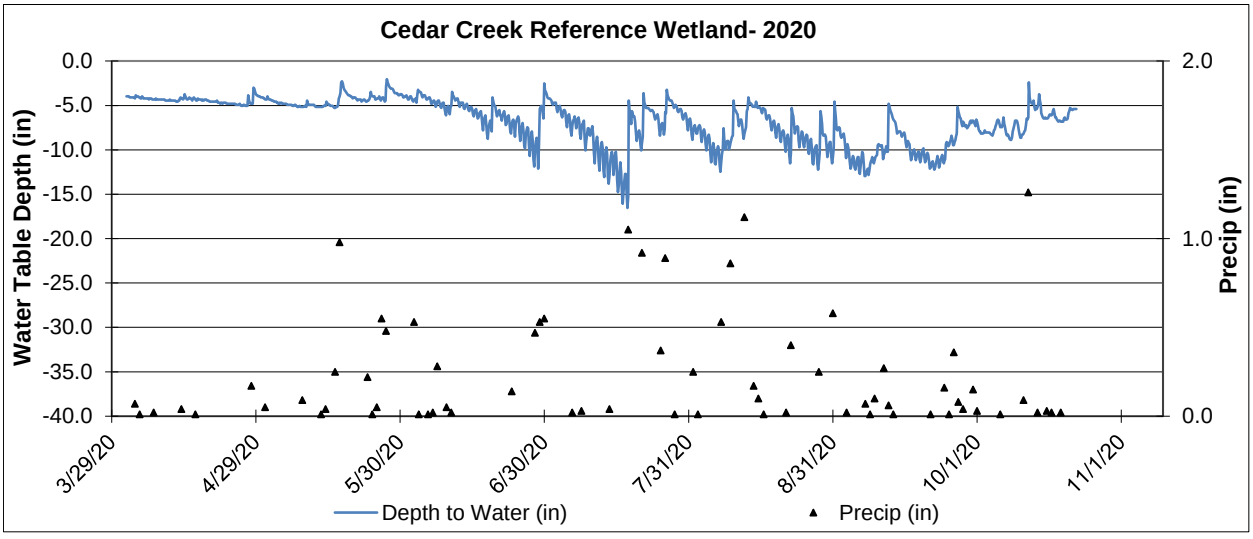
Site Information

Monitored Since:	1996
Wetland Type:	6
Wetland Size:	unknown, likely >150 acres
Isolated Basin?	No
Connected to a Ditch?	No
Soils at Well Location:	not yet available
Surrounding Soils:	Zimmerman
Vegetation at Well Location:	not yet available



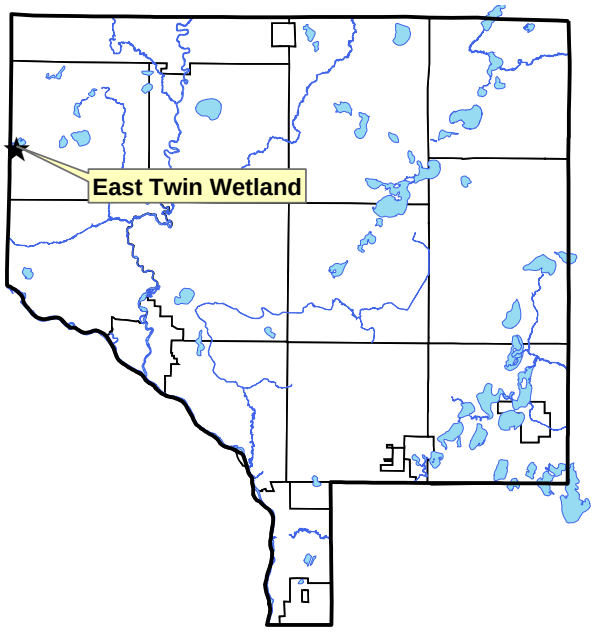
Other Notes: The Cedar Creek Ecosystem Science Reserve, where this wetland is located, is a University of Minnesota research area. Much of this area, including the area surrounding the monitoring site, is in a natural state. This wetland probably has some hydrologic connection to the floodplain of Cedar Creek, which is 0.7 miles from the monitoring site.

2020 Hydrograph



EAST TWIN REFERENCE WETLAND

Twin Lake City Park, Nowthen



Site Information

Monitored Since: 2001

Wetland Type: 5

Wetland Size: ~5.9 acres

Isolated Basin? Yes

Connected to a Ditch? No

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
A	0-8	10yr 2/1	Mucky Loam	-
Oa	Aug-40	N2/0	Organic	-

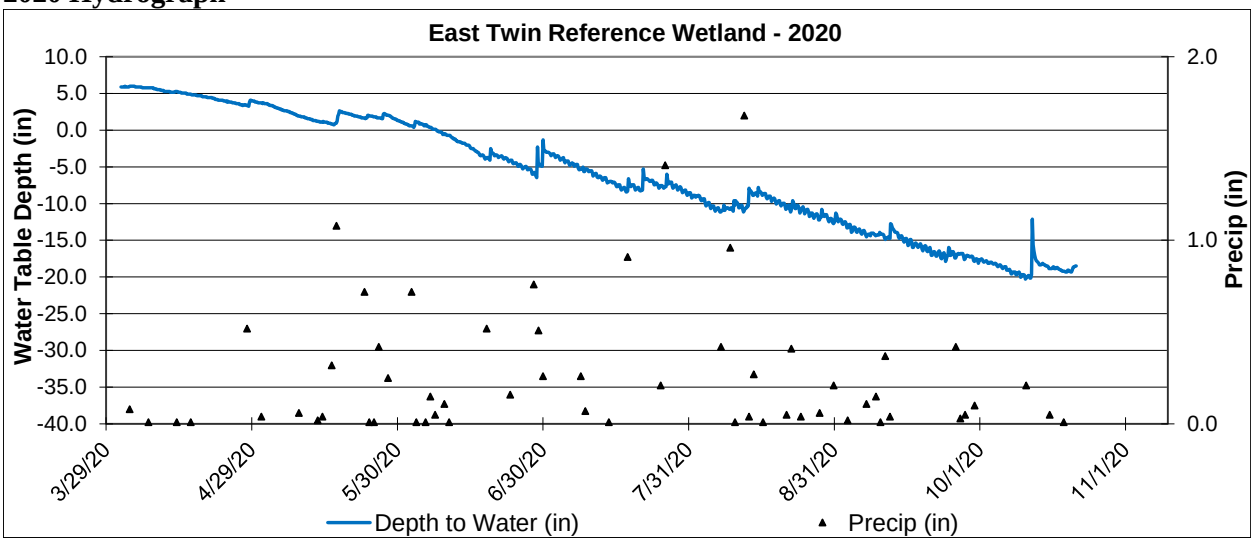
Surrounding Soils: Lake Beach, Growton and Heyder fine sandy loams

Vegetation at Well Location:

Scientific	Common	% Coverage
Phalaris arundinacea	Reed Canary Grass	100
Cornus amomum	Silky Dogwood	30
Fraxinus pennsylvanica	Green Ash	30

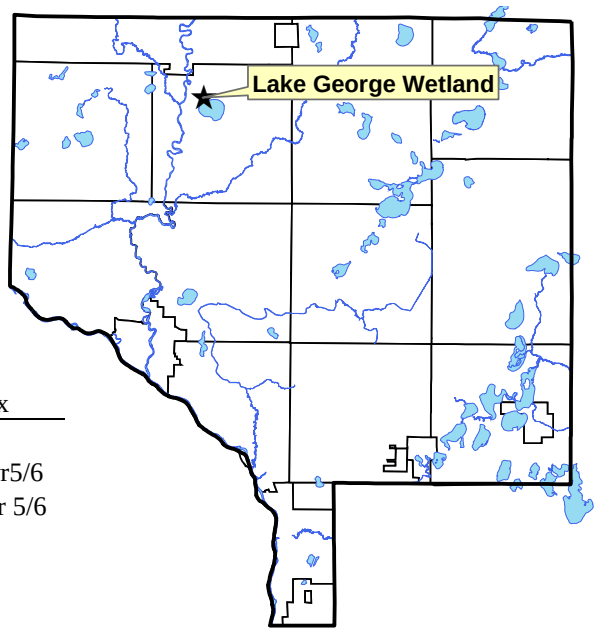
Other Notes: This wetland is located within Twin Lakes City Park, and is only 180 feet from the lake itself. Water levels in the wetland are influenced by lake levels.

2020 Hydrograph



LAKE GEORGE REFERENCE WETLAND

Lake George County Park, Oak Grove



Site Information

Monitored Since: 1997

Wetland Type: 3/4

Wetland Size: ~9 acres

Isolated Basin? Yes, but only separated from wetland complexes by roadway.

Connected to a Ditch? No

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
A	0-8	10yr2/1	Sandy Loam	-
Bg	8-24	2.5y5/2	Sandy Loam	20% 10yr5/6
2Bg	24-35	10gy 6/1	Silty Clay Loam	10% 10yr 5/6

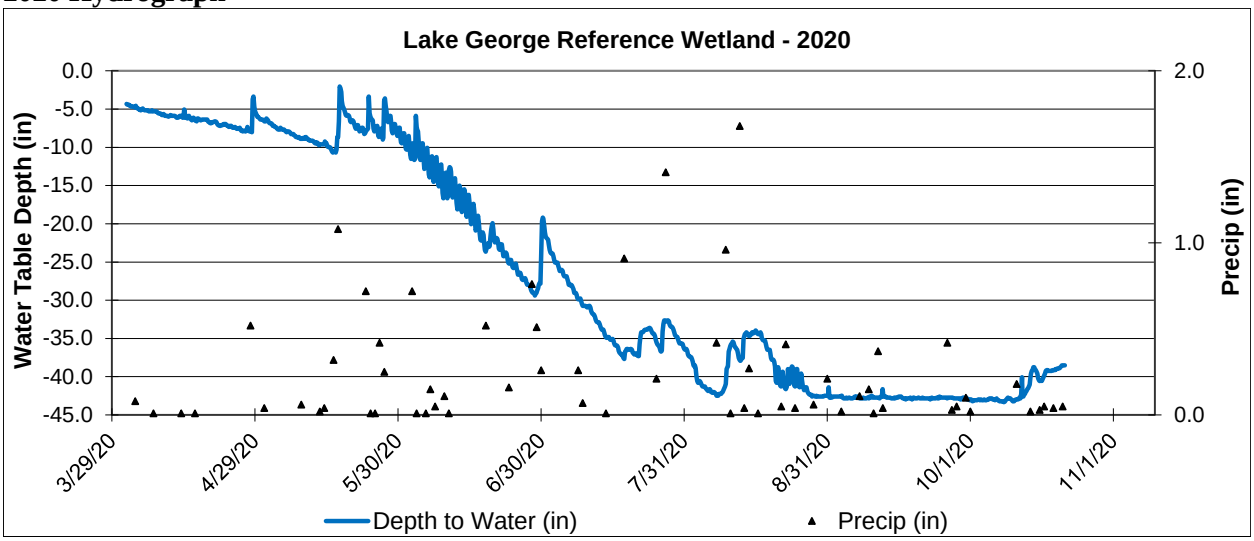
Surrounding Soils: Lino loamy fine sand and Zimmerman fine sand

Vegetation at Well Location:

Scientific	Common	% Coverage
Cornus stolonifera	Red-osier Dogwood	90
Populus tremuloides	Quaking Aspen	40
Quercus rubra	Red Oak	30
Onoclea sensibilis	Sensitive Fern	20
Phalaris arundinacea	Reed Canary Grass	10

Other Notes: This wetland is located within Lake George County Park, and is only about 600 feet from the lake itself. Much of the vegetation within the wetland is cattails.

2020 Hydrograph

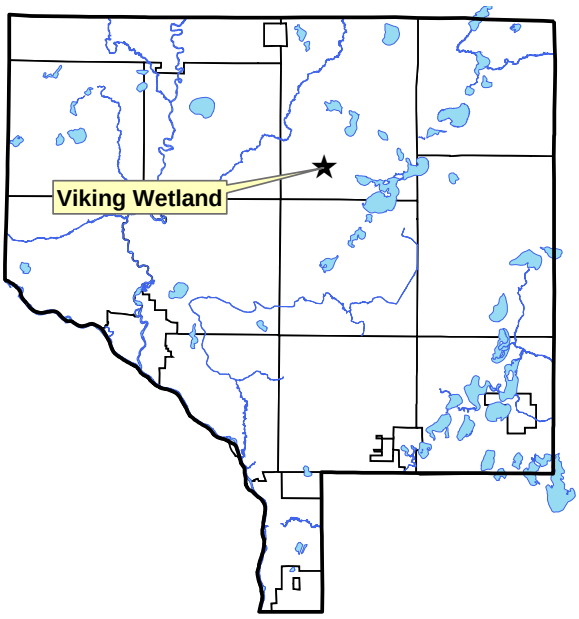


Wetland Hydrology Monitoring

VIKING MEADOWS REFERENCE WETLAND

Viking Meadows Golf Course, East Bethel

Site Information



Monitored Since: 1999

Wetland Type: 2

Wetland Size: ~0.7 acres

Isolated Basin? No

Connected to a Ditch? Yes, highway ditch is tangent to wetland

Soils at Well Location:

Horizon	Depth	Color	Texture	Redox
A	0-12	10yr2/1	Sandy Loam	-
Ab	12-16	N2/0	Sandy Loam	-
Bg1	16-25	10yr4/1	Sandy Loam	-
Bg2	25-40	10yr4/2	Sandy Loam	5% 10yr5/6

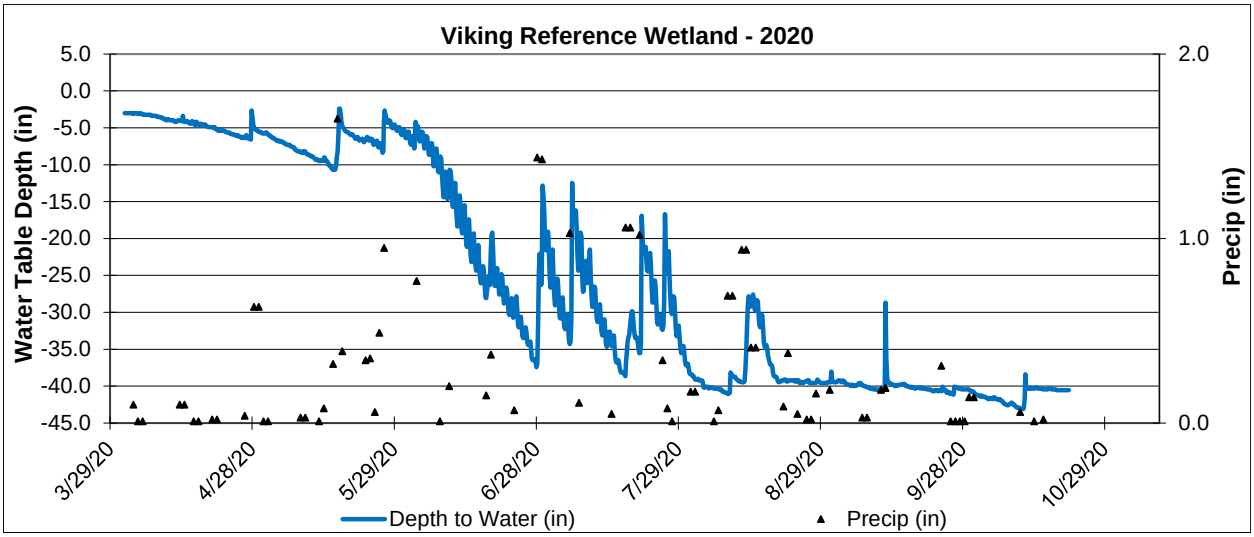
Surrounding Soils: Zimmerman fine sand

Vegetation at Well Location:

Scientific	Common	% Coverage
Phalaris arundinacea	Reed Canary Grass	100
Acer rubrum (T)	Red Maple	75
Acer negundo (T)	Boxelder	20

Other Notes: This wetland is located at the entrance to Viking Meadows Golf Course, and is adjacent to Viking Boulevard (Hwy 22).

2020 Hydrograph



Rum River Bank Erosion Grants

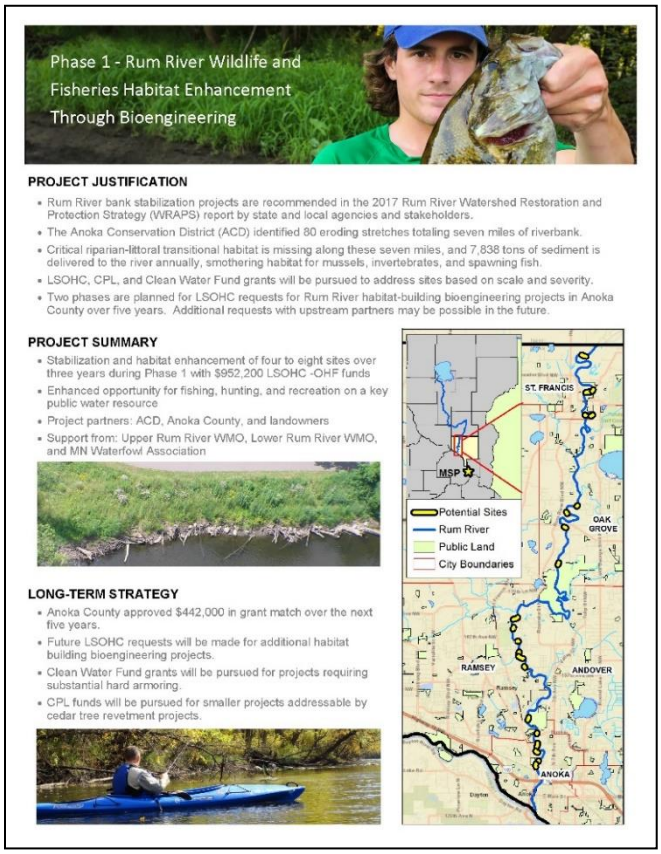
Partners: ACD, Anoka County Parks, LRRWMO, URRWMO

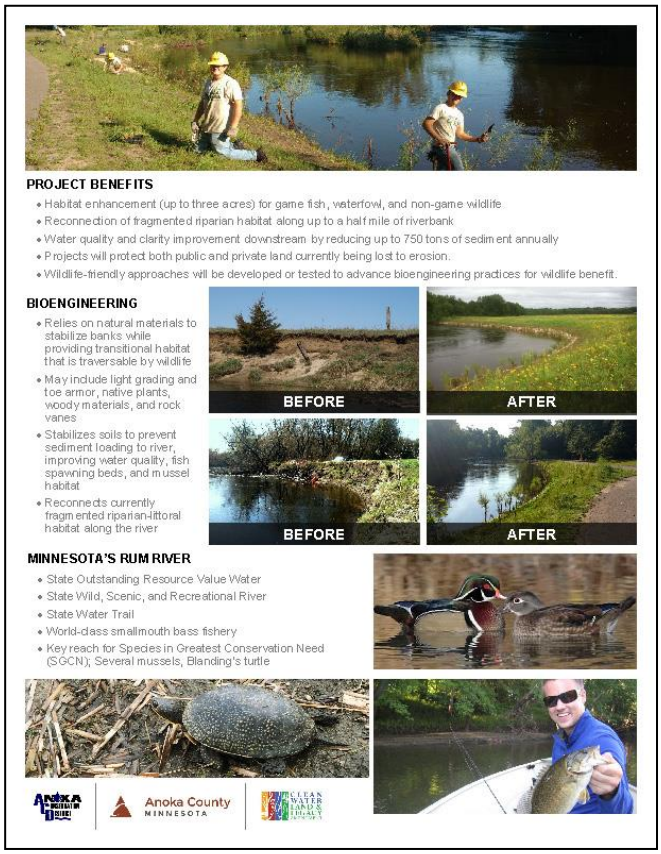
Description: The Anoka Conservation District (ACD) prepared an inventory of Rum River bank erosion using 360° photos of the riverbanks of the Rum throughout Anoka County. The photos are available through Google Maps using the Street View feature. An inventory report identifying 80 stretches of riverbank with moderate to very severe erosion is available on ACD's website. Estimated project cost and annual sediment load reduction to the river were calculated. ACD used this inventory to apply for grant funding for stabilization projects to correct some of these eroding banks. These applications, and matching money from Anoka County and the Rum River WMOs resulted in $1.4 Million to be used over the next three years for stabilization projects. This funding comes from the Outdoor Heritage Fund (OHF) and Clean Water Fund (CWF) of the Clean Water Land and Legacy Amendment.

Purpose: To identify and prioritize riverbank stabilization sites and be used by ACD and other entities to pursue grant funds to restore or stabilize eroding stretches of Rum Riverbank.

Location: Rum River conveyance throughout Anoka County

Results: Inventory of 80 stretches of moderate to very severe erosion on banks of the Rum River. $1.4 Million has been secured in grant and matching funds to implement stabilization projects.





Application illustration for the Lessard-Sams Outdoor Heritage Council to do Rum River stabilization projects utilizing bioengineering approaches. The LSOHC reccomended funding these projects at $816,000

over the next three years, which will be matched with $205,000 in local funds from Anoka County and the Upper and Lower Rum River WMOs.

URRWMO Website

Partners: URRWMO, ACD

Description: The Upper Rum River Watershed Management Organization (URRWMO) contracted the Anoka Conservation District (ACD) to design and maintain a website about the URRWMO and the watershed.

Purpose: To increase awareness of the URRWMO and its programs. The website also provides tools and information that helps users better understand water resources issues in the area.

Location: www.URRWMO.org

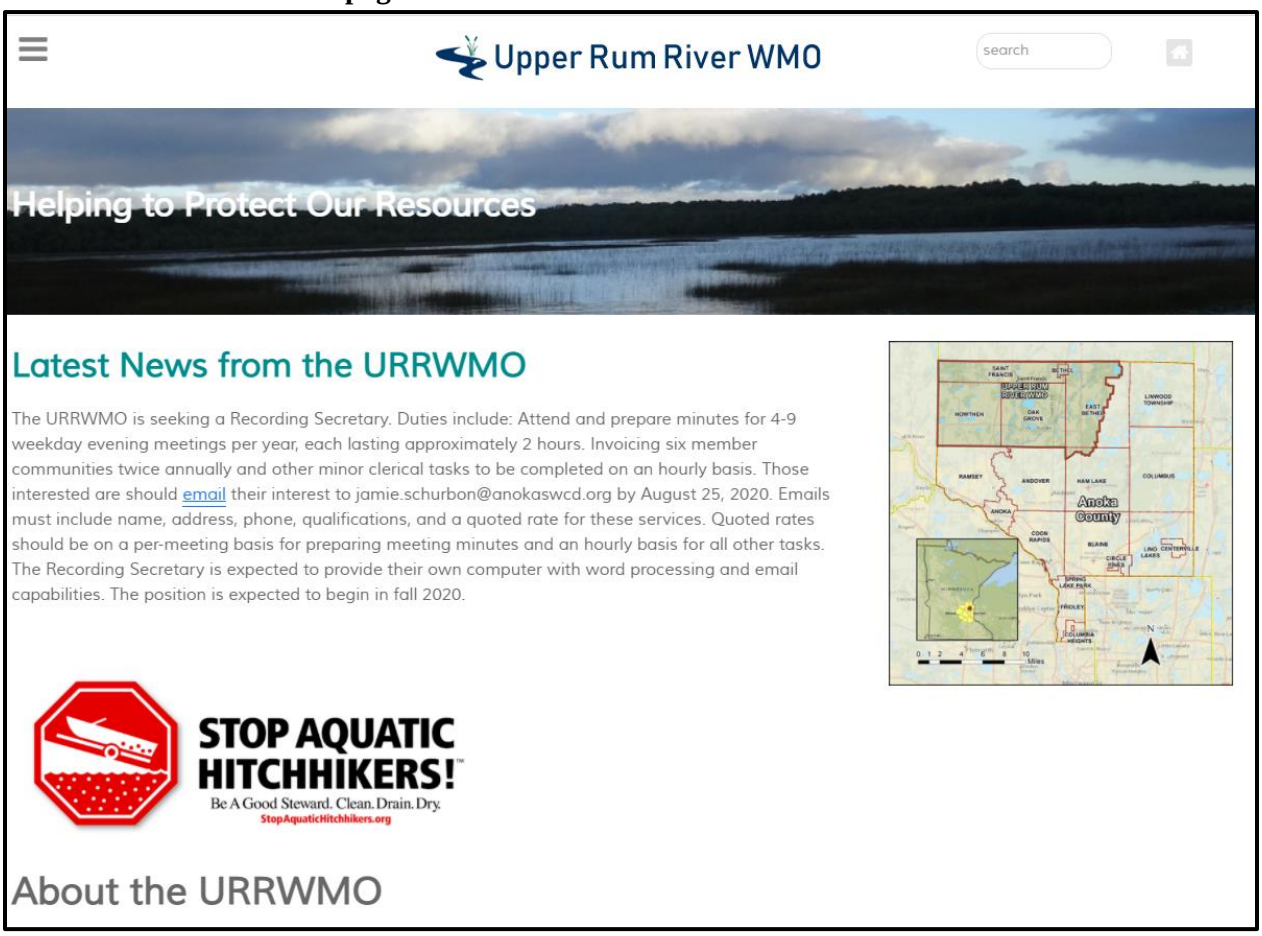
Results:

In 2020 routine URRWMO 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.

URRWMO Website Homepage



URRWMO Annual Newsletter

Partners: URRWMO, ACD

Description: The URRWMO Watershed Management Plan and state rules call for an annual URRWMO newsletter in addition to the WMO website. The URRWMO produces a newsletter article including information about the URRWMO, its programs, related educational information, and the URRWMO website address. This article is provided to each member city, and they are asked to include it in their city newsletters.

Purpose: To increase public awareness of the URRWMO and its programs as well as receive input.

Locations: Watershed-wide.

Results: The Anoka Conservation District (ACD) assisted the URRWMO by drafting the annual newsletter article about new partnerships for student water quality monitoring on the Rum River. The URRWMO Board reviewed and edited the draft article.

2020 URRWMO Newsletter Article

Upper Rum River Watershed Management Organization

MEDIA RELEASE

Contact person: Jamie Schurbon 763-434-2030 ext. 21
Date: April 17, 2020

Rum River Gets Attention from Local Watershed Organization, Students

The Rum River is one of six State Wild, Scenic and Recreational Rivers. Quaint and quiet along much of its length, the river is a recreational hotspot for fishing and canoeing. Its waters, after they join with the Mississippi River, are also a drinking water source for the Twin Cities. This important river has a local entity, the Upper Rum River Watershed Management Organization (URRWMO) that cares for it.

The URRWMO has found partnerships with St. Francis High School science classes and the American Legion. Science classes have visited the river across the street from the school to inventory invertebrates (bugs, crawfish, snails, etc) living in the river. They were accompanied by professionals from the Anoka Conservation District, who set the scientific protocols and used the resulting data. Because each invertebrate has a unique pollution tolerance and habitat requirement, the students could calculate metrics of river health. They found the Rum River in northern Anoka County is in good health, and has remained so over the years.

The program to combine education and data collection is ongoing thanks to support from the American Legion. While over 1,000 high school students monitored the river's health 2000 to 2015, the program's funding source faltered thereafter. The program shut down for three years. In 2019 the program was restarted, thanks to financial help from the American Legion. That year 40 students again entered the river with nets. The funding and work is planned to continue in 2020.

Leadership for this and other river stewardship is provided by the URRWMO. The URRWMO is a special purpose unit of government formed by the cities of Bethel, East Bethel, Ham Lake, Oak Grove, Nowthen and St. Francis. Its purpose is to manage the area's waters, particularly those that flow across city boundaries. For more information visit www.URRWMO.org.

Photo provided as separate image file.

Annual Mini-Report to Member Cities

Partners: URRWMO, ACD

Description: The Upper Rum River Watershed Management Organization (URRWMO) provides a brief annual report to its member communities. This is in addition to, and shorter than, reports to the State that are also shared with the member cities.

Purpose: To improve communication between member cities, especially city councils, and the URRWMO.

Locations: Watershed-wide

Results: The Anoka Conservation District assisted the URRWMO with preparation of a 2020 mini-report to member cities. The report highlighted recent accomplishments and upcoming work.

April 2020 Report to Member Cities

INFORMATION FOR CITY COUNCILS

ABOUT THE UPPER RUM RIVER WATERSHED MANAGEMENT

URRWMO BOARD

City of Bethel
David Olsrud
Ryan Sequin

City of East Bethel
Tim Harrington
Radja Lohse

City of Ham Lake
Sandy Flaherty (Treasurer)

City of Nowthen
Dan Breyen (V. Chair)
Joel Greenberg

City of Oak Grove
John West (Chair)
Dan Denno

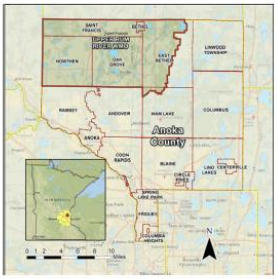
City of St. Francis
Lan Tornes
Vacant

Upper Rum River WMO Annual Mini-Report to Cities

APRIL 2020

New URRMWO Watershed Mgmt Plan Approved!

The URRWMO's new 10-year watershed management plan was approved by the MN Board of Soil and Water Resources (BWSR) and adopted by the URRWMO in summer 2019. The plan will guide the URRWMO's work and expenditures, including community contributions. Congrats to all who worked to get this plan approved.



Map of the URRWMO

$1.4M in Grants for Eroding Rum Riverbanks

Partners in the Anoka County portion of the Rum River watershed have secured over $1.4 million dollars in state grant funds for stabilizing Rum Riverbanks and improving near-shore habitat. The effort was led by the Anoka Conservation District, with grant matching funds from the URRWMO, Lower Rum River WMO, and Anoka County. This project is one of three high priority projects in the URRWMO plan.

The Anoka Conservation District (ACD) has created an inventory of Rum Riverbanks from St. Francis to Anoka.

That inventory identifies 80 stretches of moderate to severe erosion. Owners of those properties will be invited to work with ACD on riverbank erosion control. Work will only be done where there are willing landowners.

The grant term is three years. Work begins in 2020. Funds are from the Outdoor Heritage Fund and the MN DNR Conservation Partners Legacy Program. Both use funds from the Clean Water, Land and Legacy Amendment.

Riverbank erosion sites

2019 Accomplishments

- Watershed plan approved— Adopted our URRWMO 10-year plan draft.
- Lake George Connections—The URRWMO took a pontoon tour of Lake George with the two lake groups, building relationships and collaboration.
- High school biomonitoring—We restarted the Rum River biomonitoring program with St. Francis High School, with funding assistance from the American Legion. 40 students participated.
- Technical Advisory Committee (TAC)—Assembled a TAC, primarily of city staff, to prioritize projects, develop a culvert inventory methods, and update URRWMO wetland and stormwater standards.
- Participated in One Watershed One Plan (1W1P)—Joined with other watershed organizations, counties, and soil and water conservation districts to create a plan that coordinates our local activities to achieve regional goals. URRWMO board member Matt Downing is the vice-chair of the Policy Committee that oversees the planning.

2020 Plans

- Water condition monitoring—Continue routine monitoring at East Twin, George, Rogers and Minard Lakes.
- TAC—Reconvene our TAC to guide development of a standardized stormwater treatment practice inspection process, ensure city ordinances are consistent with URRWMO standards, and other tasks.
- Watershed Based Implementation Funding—Participate in a new non-competitive grant program from the State (see article below). $366,000 in funding is available and will recur every two years. It is a major opportunity to accomplish URRWMO priorities that are otherwise financially difficult.
- High school biomonitoring—Continue the Rum River biomonitoring program with St. Francis High Schools. The American Legion, has renewed its financial support for students to catch macroinvertebrates (bugs) and use them as a gauge of river health.
- Riverbank stabilizations—The Anoka Conservation District will begin design and construction planning for riverbank stabilizations (article on page 1 of this report).

Watershed Based Funding

The URRWMO and its cities are participating in a major new funding collaboration called Watershed Based Implementation Funding (WBIF). This state grant is not competitive. $366,000 is available for the metro Rum River Watershed (i.e. the Anoka County portions of the Rum River watershed).

Eligible projects must be in WMO plans, 1W1P or the Anoka Conservation District's annual plan. It Projects must improve water quality. It is more important than ever that cities incorporate their priority water quality projects into the URRWMO plan. Cities are eligible to directly receive grant funds.

The grant is not competitive, but is collaborative. How the funds are used is decided by representatives from cities, the Lower and Upper Rum River WMO's, and the Anoka Conservation District. Chuck Schwartz is the representative for URRWMO cities. Matt Downing is the representative for the URRWMO.

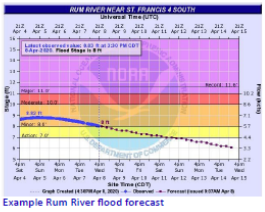
The meetings to decide how funding is allocated begin in April 2020. Two to three meetings are anticipated.

The MN Board of Water and Soil Resources is administering the funds and overseeing the funding allocation process.

New Flood Forecasting

The National Weather Service has begun flood forecasting for the Rum River at Viking Boulevard. This new service was prompted by a request from communities throughout the Rum River watershed. Forecasts were already put into action during high water of spring 2020.

Forecasts are available at https://water.weather.gov



Example Rum River flood forecast

www.URRWMO.org

Annual Reports to the State

Partners: URRWMO, ACD

Description: The Upper Rum River Watershed Management Organization (URRWMO) is required by law to submit an annual report to the Minnesota Board of Water and Soil Resources (BWSR). This report consists of an up-to-date listing of URRWMO Board members, activities related to implementing the URRWMO Watershed Management Plan, the status of municipal water plans, financial summaries, and other work results. The report is due annually 120 days after the end of the URRWMO's fiscal year (April 30th).

Additionally, the URRWMO is required to perform annual financial reporting to the State Auditor. This includes submitting a financial report and filling out a multi-worksheet form.

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

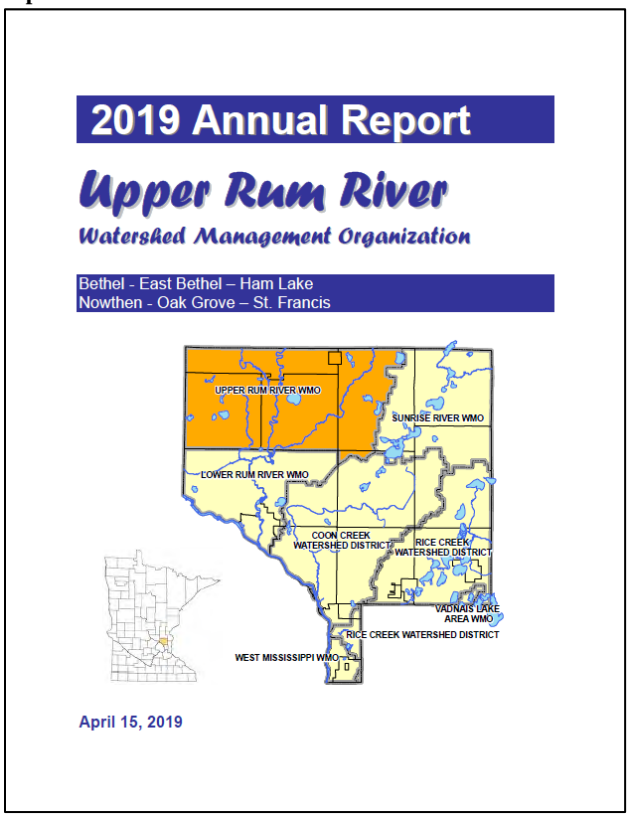
Locations: Watershed-wide

Results: The Anoka Conservation District assisted the URRWMO with preparation of a 2020 Upper Rum River WMO Annual Report to BWSR and reporting to the State Auditor. This included:

- Preparation of an unaudited financial report,
- A report to BWSR meeting MN statutes,
- State Auditor's reporting forms through the State's SAFES website.

All were completed by the end of April 2021. The report to BWSR and financial report are available on the URRWMO website.

Report to BWSR Cover



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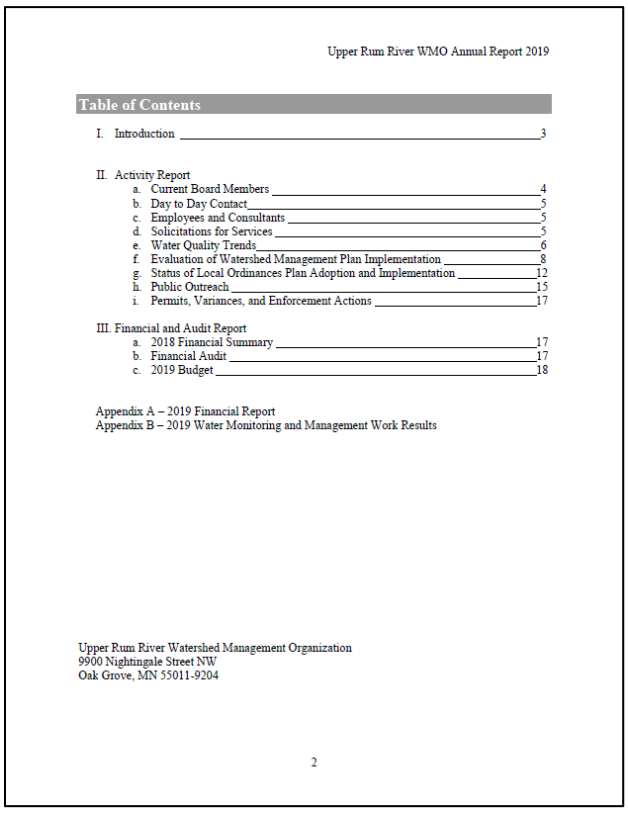

Watershed Coordinator Services

Description: The Anoka Conservation District serves as URRWMO Watershed Coordinator. This includes providing a variety of administrative services. Tasks are limited to those defined in a contractual agreement.

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

Results: In 2020 administrative assistance provided to the URRWMO 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 URWMO and subsequent revisions.
- Ordered and facilitated an audit-like agreed upon procedures review with an auditor.
- Represented the URRWMO at staff level meetings of the Rum River One Watershed One Plan. Reported back to the URRWMO board, including facilitating discussion about implementation organizational arrangements (JPC vs JPE).
- Assisted with represented the URRWMO on the metro Rum Watershed Based Implementation Funding convene group, resulting in funding for the following in the URRWMO area: Rum Riverbank stabilizations, stormwater retrofits, Lake George shoreline stabilizations, outreach/education, and a Ford Brook subwatershed assessement study.
- Facilitated the URRWMO's technical advisory committee resulting in five board-approved items (wetland & stormwater standards, culvert inventory protocols, landlocked basins standards, and project prioritization). All were required under the URRWMO Watershed Management Plan.
- Completed an amendment to the URRWMO Watershed Management Plan.
- Addressed financial and budgeting concerns from Ham Lake, including multiple meetings.
- Worked with member cities who are required to ensure their ordinances are consistant with URRWMO standards.
- Reviewed and provided recommended URRWMO actions on community local water plans.
- Created a new template for city reporting to the URRWMO. Solicited and received annual reports.
- Requested and received biomonitoring funding from the American Legion.
- Fielded permitting questions from the county highway department and builders.
- Created a new URRWMO logo.

Recommendations

- **Participate in the Rum River One Watershed One Plan** process, resulting in prioritized management across the entire Rum River watershed.
- **Fund and install projects identified in the URRWMO Watershed Management Plan**. This prioritized list was created by the URRWMO Technical Advisory Committee (TAC):
    1. Rum Riverbank stabilizations*
    2. Anoka County Water Resources Outreach Collaborative*
    3. (Tied) Stormwater retrofits for the Rum River and subwatershed assessments*. Prioritized subwatershed assessment areas are: a) Pickerel Lake b) East Twin Lake c) Rum River direct drainage and d) City of Bethel periphery
    4. Lake George shoreline stabilizations*
    5. Lake George iron-enhanced sand filter feasibility study
    6. Ditch 19 connector dredging

* Indicates projects that have been initiated using State grant funds and URRWMO matching funds.

- **Bring projects to a construction-ready status** so they are positioned for State Watershed Based Implementation Funds. 10% match is needed for these grants.
- **Monitor Lake George water quality at least every other year.** The lake has had a declining clarity trend in recent years. The Lake Improvement District has taken up monitoring every other year when the URRWMO has not funded that work, but would prefer to put their dollars into projects.
- **Promote practices that limit road deicing salt applications** while keeping roads safe. Streams throughout the URRWMO have increasing specific conductivity. Requiring municipal plow drivers to become certified through MN Pollution Control Agency deicing courses is recommended.
- **Periodically monitor chlorides in streams**. Monitoring every 3 years minimum is recommended.
- **Promote groundwater conservation and protection.** Metropolitan Council models predict 3+ ft. drawdown of surface waters in parts of the URRWMO by 2030, and 5+ ft. by 2050. This indicates conservation actions will be required to ensure the groundwater supply stays sufficient. Infiltration practices should be highly prioritized, and unused wells on private/public lands should be sealed to prevent contamination.