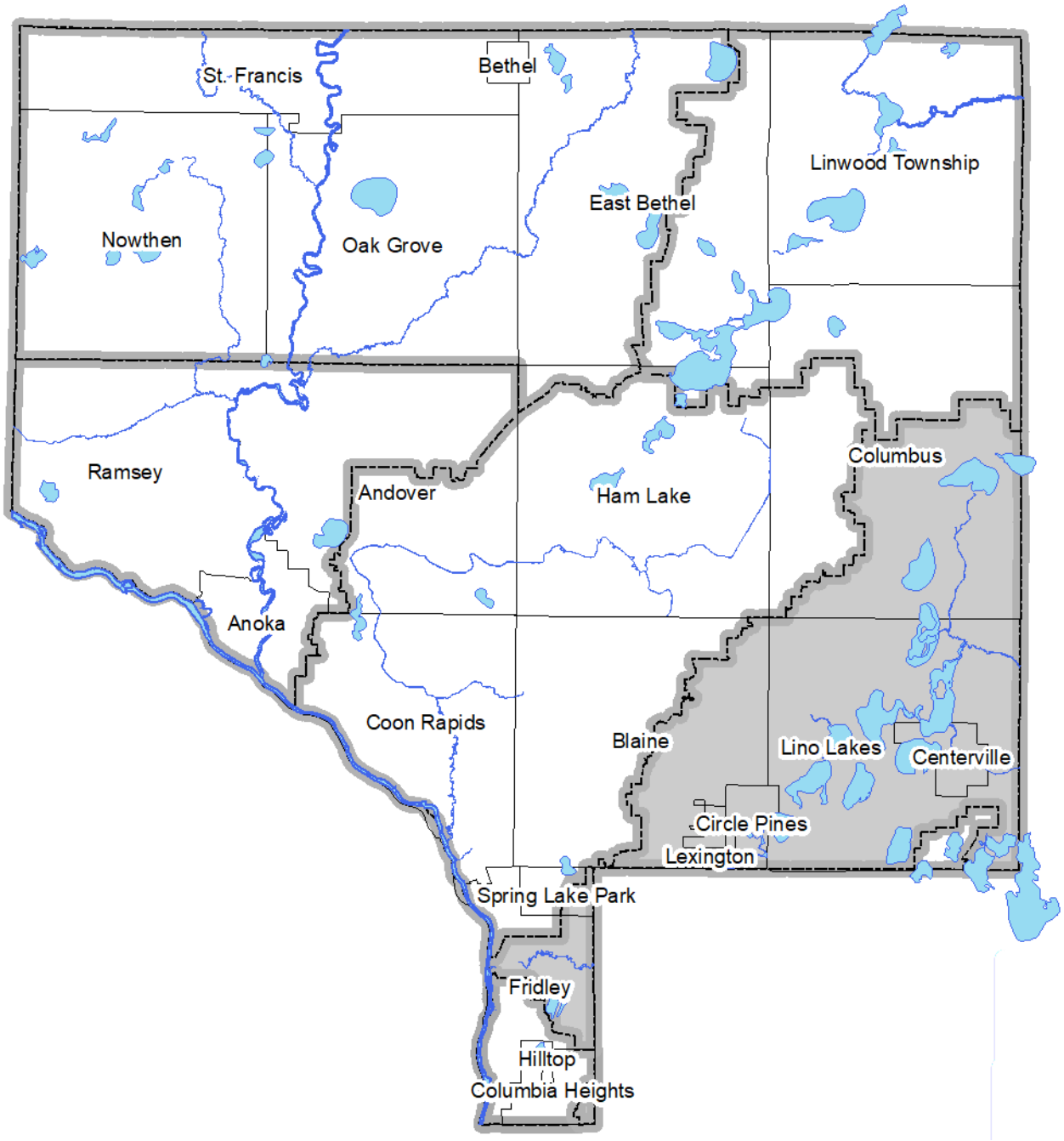
Excerpt from the 2022 Water Almanac

Chapter 5: Rice Creek Watershed



Prepared by the Anoka Conservation District

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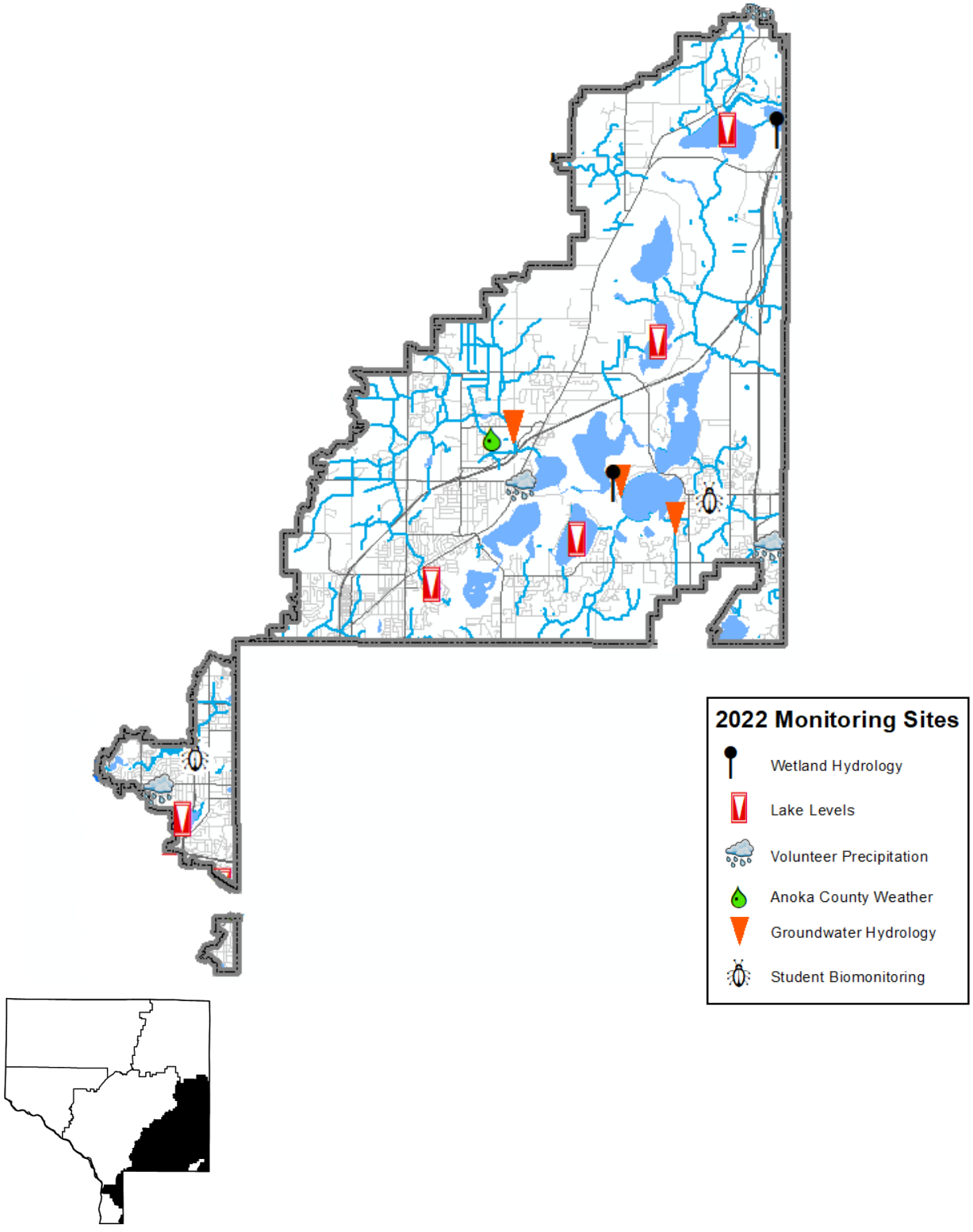
Recommendations

- **Continue to install cost effective projects** identified in preciously completed Subwatershed Retrofit Analyses. Projects identified in these studies would be ideal candidates for targeted outreach about available cost share funds. In many cases, projects are already sited, and the water quality benefits of potential projects have already been modelled.
- **Continue the biomonitoring program** with area schools at Rice Creek and Clearwater Creek. This program provides dual benefits in contributing to a long-term bio-indicator dataset as well as educating local youth.
- **Continue work to improve the ecological health of Clearwater, Hardwood, and Rice Creeks.** Clearwater Creek is designated as impaired for aquatic life based on fish and invertebrate IBIs. Hardwood Creek is impaired based on invertebrate data and low dissolved oxygen. Rice Creek is impaired for both fish and invertebrate IBIs downstream of Baldwin Lake in Anoka County.
- **Continue efforts to reduce road salt use.** Chlorides are pervasive throughout shallow aquifers and the streams that feed them.

2022 Water Monitoring Sites: Rice Creek Watershed



Lake Level Monitoring

Partners: RCWD, ACD, Volunteers

Description: Weekly water level monitoring was conducted by local volunteers using staff gages installed in each lake. Staff gages were installed by the Anoka Conservation District and surveyed by the MN DNR. VolunteerThe 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 (https://www.dnr.state.mn.us/lakefind/index.html).

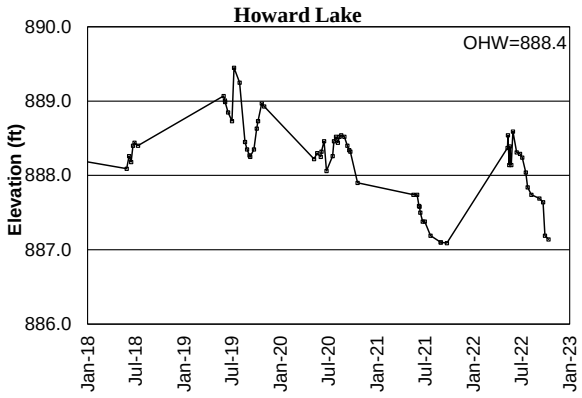
Purpose: To understand lake hydrology, including the impact of climate or other water budget changes. These data are useful for regulatory, building/development, and lake management decisions.

Locations: Howard Lake, Moore Lake, Reshanau Lake, Rondeau Lake, and Golden Lake

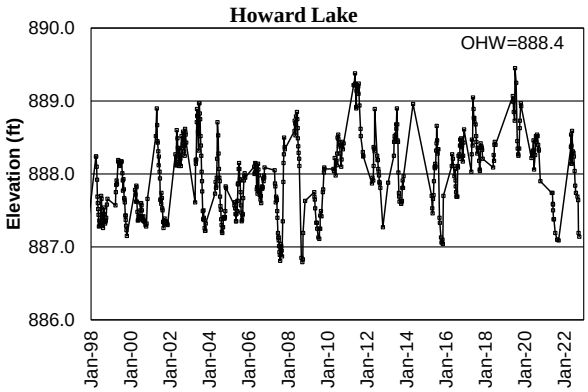
Results: In 2022, lake levels started near average and declined throughout the season. Anoka County experienced drought from June through the fall. Howard Lake reached its lowest level since 2015, Reshanau its lowest since 2013, and Moore Lake had its lowest water levels on record. Golden Lake water levels were the second lowest ever recorded, behind 1989. A long-time volunteer suffered a medical emergency and no readings were taken on Rondeau Lake in 2022. Outreach will be completed in the spring to find a replacement volunteer for 2023.

The Ordinary High Water Level (OHW) is listed for each lake on the corresponding graphs below. Any work performed below this elevation requires a DNR permit.

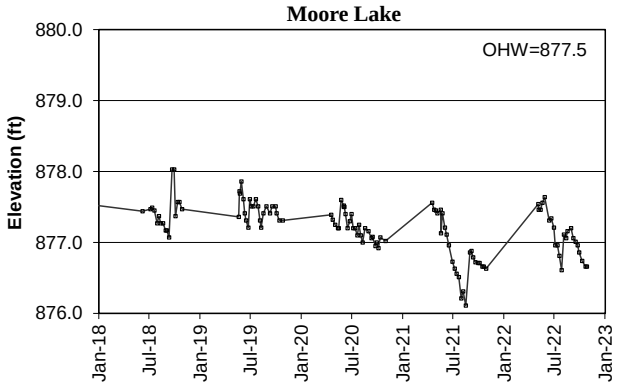
Howard Lake Levels – last 5 years



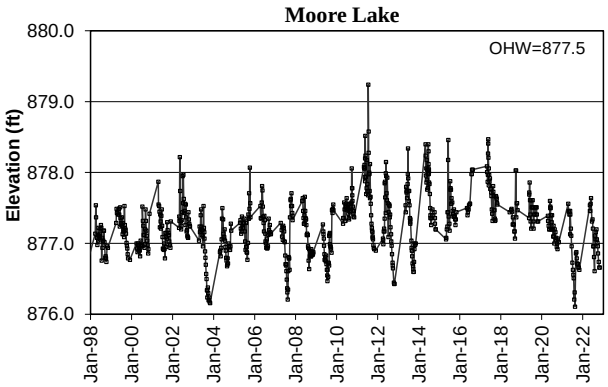
Howard Lake Levels – last 25 years



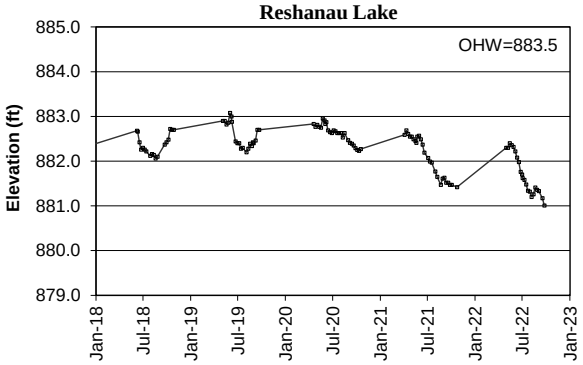
Moore Lake Levels – last 5 year



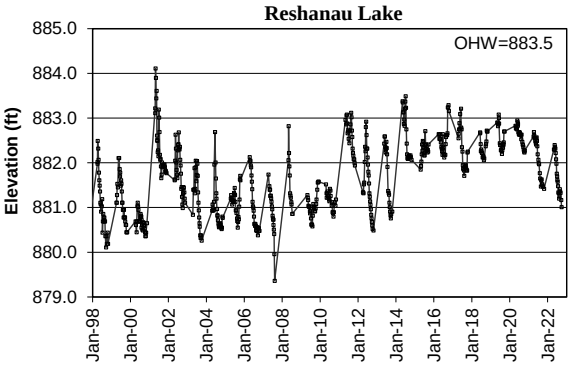
Moore Lake Levels – last 25 years



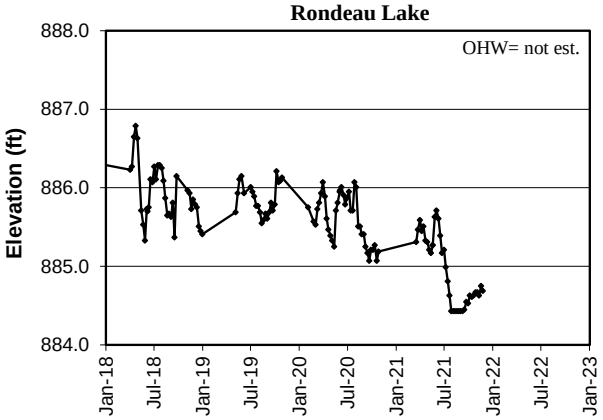
Reshanau Lake Levels – last 5 years



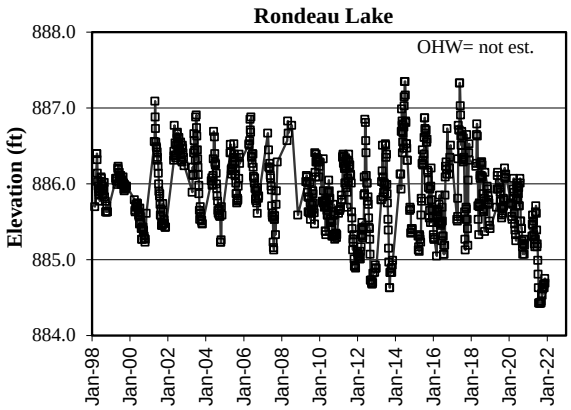
Reshanau Lake Levels – last 25 years



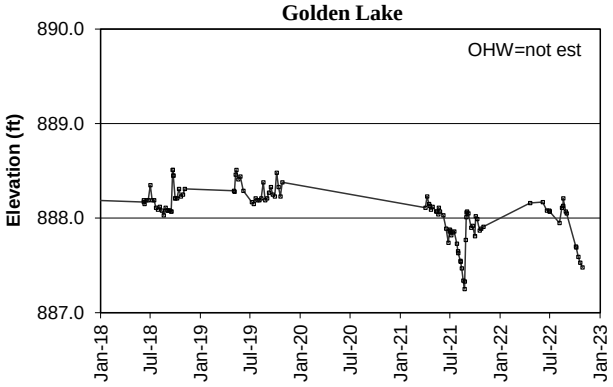
Rondeau Lake Levels – last 5 years



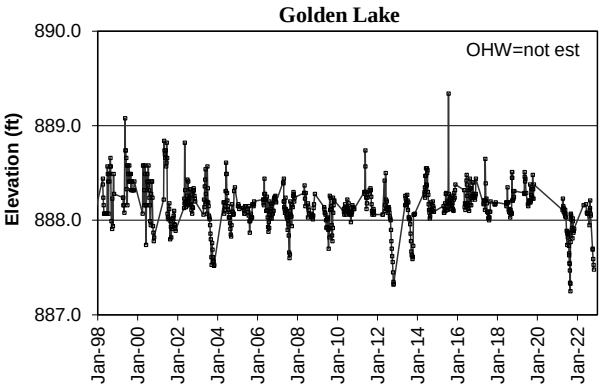
Rondeau Lake Levels – last 25 years



Golden Lake Levels – last 5 years



Golden Lake Levels – last 25 years



Lake	Year	Average	Min	Max
Howard	2018	888.30	888.09	888.44
	2019	888.77	888.25	889.45
	2020	888.34	887.90	888.54
	2021	887.40	887.09	887.74
	2022	888.02	887.14	888.59

Lake	Year	Average	Min	Max
Moore	2018	877.44	877.07	878.03
	2019	877.47	877.21	877.86
	2020	877.22	876.92	877.60
	2021	876.88	876.11	877.56
	2022	877.10	876.61	877.64

Lake	Year	Average	Min	Max
Golden	2017	888.17	888.00	888.65
	2018	888.20	888.03	888.51
	2019	888.30	888.15	888.51
	2021	887.88	887.25	888.23
	2022	887.95	887.48	888.21

Lake	Year	Average	Min	Max
Reshanau	2018	882.38	882.06	882.72
	2019	882.58	882.20	883.08
	2020	882.61	882.23	882.95
	2021	882.08	881.42	882.69
	2022	881.70	881.01	882.40

Wetland Hydrology

Partners: RCWD, ACD

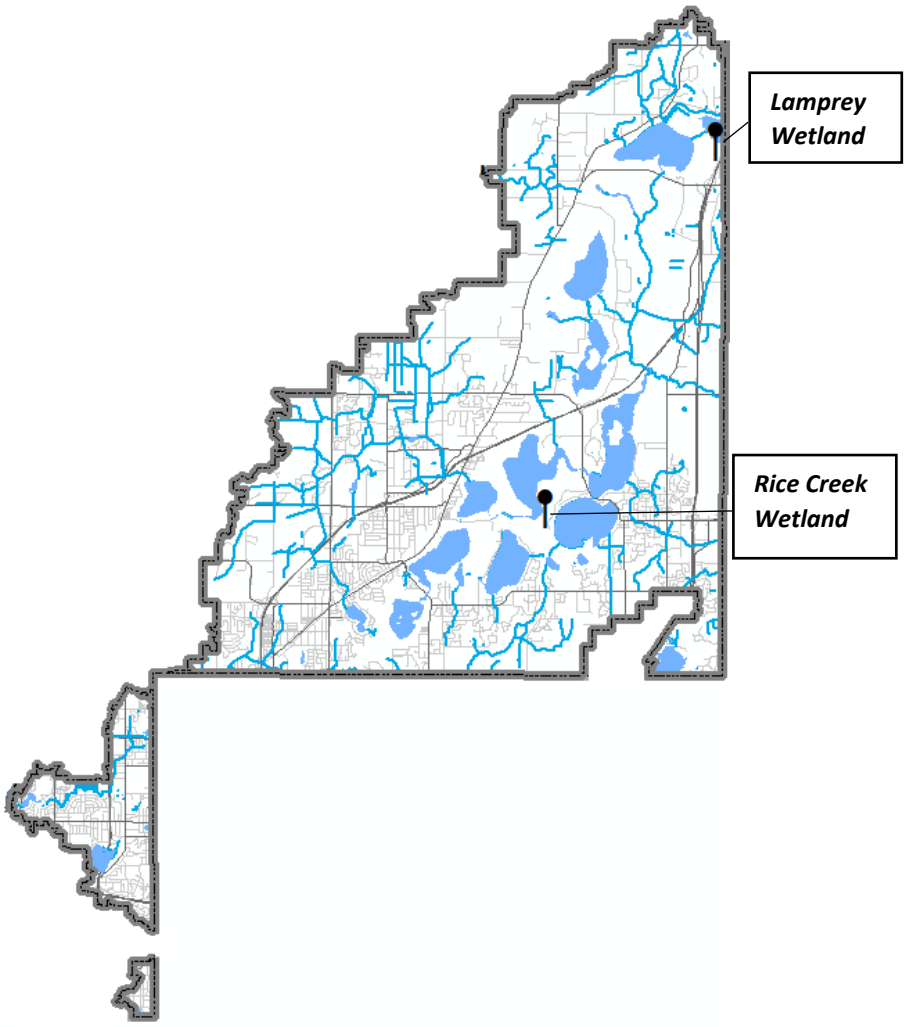
Description: Continuous groundwater level monitoring within wetland areas. Countywide, the Anoka Conservation District maintains a network of 23 wetland hydrology monitoring stations.

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

Locations: Lamprey Reference Wetland, Rice Creek Reference Wetland

Results: See the following pages.

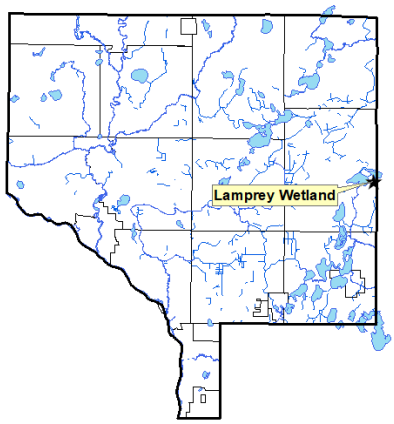
Rice Creek Watershed Wetland Monitoring Sites



LAMPREY REFERENCE WETLAND

Lamprey Pass Wildlife Management Area, Columbus

Site Information



Monitored Since: 1999

Wetland Type: 4

Wetland Size: ~0.5 acres

Isolated Basin: Yes

Connected to a Ditch: No

Surrounding Soils: Braham loamy fine sand

Soils at Well Location:

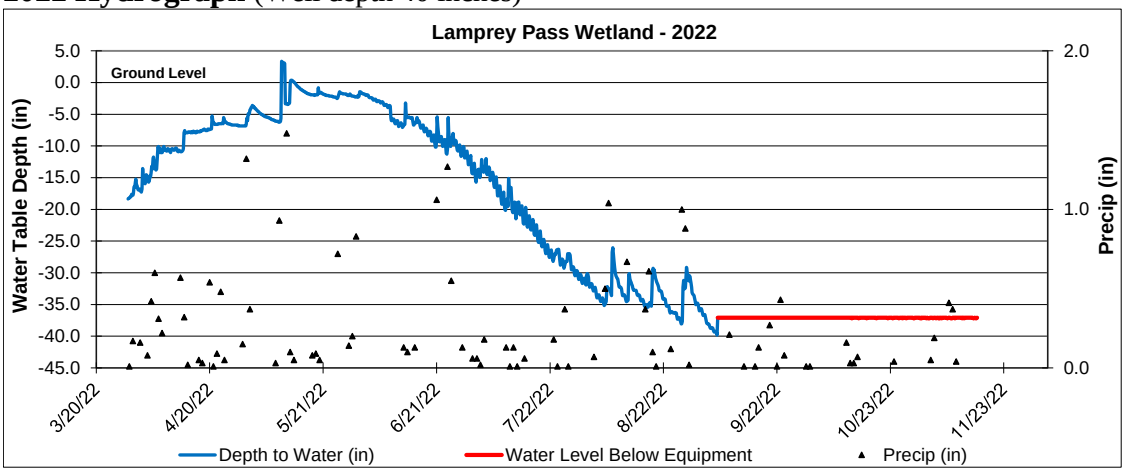
Horizon	Depth	Color	Texture	Redox
A	0-9	10yr 2/1	Fine Sandy Loam	-
AB	9-19	10yr 2/1	Fine Sandy Loam	2% 10yr 5/6
Bw	19-35	10ry 3/1	Loam	2% 10ty 5/4
2C1	35-42	5y 5/2	Clay Laom	5y 3/1 Organic Streaking
2C2	42-48	2.5y 5/1	Sandy Loam	2.5y 5/6

Vegetation at Well Location:

Scientific	Common	% Coverage
Carex pennsylvanica	Pennsylvania Sedge	50
Cornus stolonifera (S)	Red-osier Dogwood	20
Fraxinus pennslyvanicum (T)	Green Ash	40
Xanthoxylum americanum	Pricly Ash	20
Bare Ground		20

Other Notes: Wetland is within a state WMA and the boring is located at a wetland boundary. In 2022, Anoka County was abnormally dry or experiencing a state of drought, water levels fell below the equipment in the fall season.

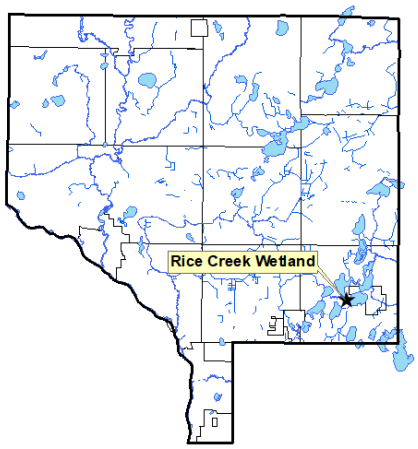
2022 Hydrograph (Well depth 40 inches)



RICE CREEK REFERENCE WETLAND

Rice Creek Chain of Lakes Regional Park, Lino Lakes

Site Information



Monitored Since: 1996

Wetland Type: 7

Wetland Size: ~0.5 acres

Isolated Basin: Yes

Connected to a Ditch: No

Surrounding Soils: Nessel fine sandy loam and Blomford loamy fine sand

Soils at Well Location:

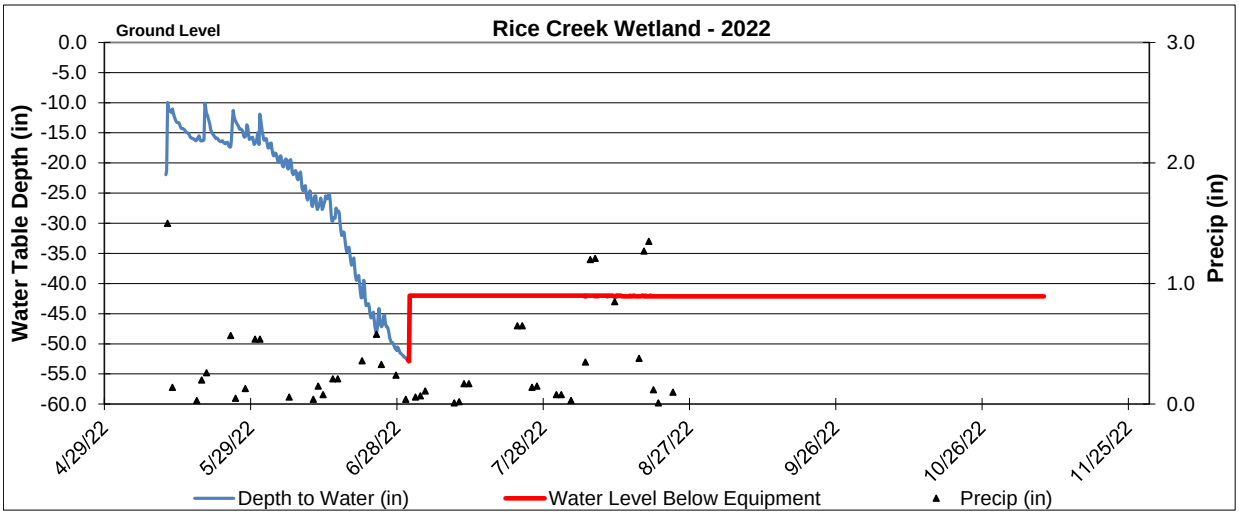
Horizon	Depth	Color	Texture	Redox
A	0-12	10yr 3/1	Sandy Loam	-
Ab	12-16	10yr 2/1	Sandy Loam	-
Bg1	16-21	10yr4/1	Sandy Loam	-
Bg2	21-35	10yr5/2	Sandy Loam	5% 10yr 5/6
2Cg	35-42	2.5y 5/2	Silt Loam	5% 10yr 5/6

Vegetation at Well Location:

Scientific	Common	% Coverage
Rubus strigosus	Raspberry	30
Onoclea sensibilis	Sensitive Fern	20
Fraxinus pennsylvanica	Green Ash	40
Amphicarpa bracteata	Hog Peanut	20

Other Notes: Well is located at wetland boundary. In 2022, Anoka County was abnormally dry or experiencing a state of drought most of the year. Water levels were below the equipment the majority of the year.

2022 Hydrograph (Well depth 45 inches)



Stream Water Quality – Biological Monitoring

Partners: ACD, Totino Grace High School, Forest Lake Area Learning Center

Description: This program uniquely combines environmental education with useful water quality stream monitoring. Under the supervision of ACD staff, high school science classes collect aquatic macroinvertebrates from a specific section of stream, identify the macroinvertebrates down to the family level, and use the biotic index to score overall 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, while other families can thrive in low quality water. Therefore, a census of stream macroinvertebrates provides important information regarding overall stream health.

Purpose: To assess stream quality through biological monitoring while providing an environmental educational service to the community.

Locations: Clearwater Creek at Centerville City Hall, Rice Creek at Locke Park

Data Interpretation

Consider all biological indices of water quality together rather than each individually, since each gives only a partial summary of a stream's condition. Compare the numbers to county-wide averages. This gives some sense of what might be expected for other streams located 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:

<u># Families</u> Number of Invertebrate families. Higher values indicate better quality.

<u>EPT</u> Number of families of the generally pollution-intolerant orders. Ephemeroptera, Plecopter, Trichoptera. Higher numbers indicate better stream quality.

<u>Family Biotic Index (FBI)</u> An Index that utilizes known pollution tolerances for each family.

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

<u>Population Attributes Metrics</u> **% EPT** compares the number of organisms in the EPT orders (Ephemeroptera, Plecoptera, Trichoptera) to the total number of organisms in the sample. A high percent of EPT is good.

% Dominant Family 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 of a few families dominate, and all others are rare).

Clearwater Creek

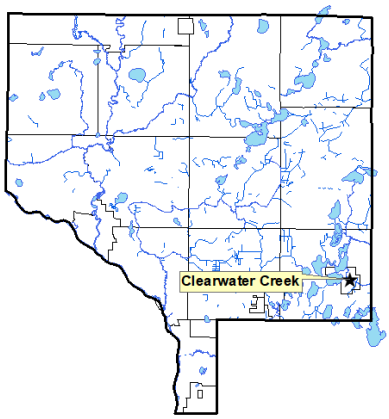
At Centerville City Hall, Centerville

Monitored Since

1999

Student Involvement

8 Students in 2022, approximately 668 students since 1999



Background

Clearwater Creek originates in Bald Eagle Lake in northwest Ramsey County and flows northwest into Peltier Lake. The land use in the area is a mix of residential and agricultural, with some small commercial sites scattered throughout. Immediately surrounding the sampling site, land use is entirely residential and developed. The streambanks at the site are steep and actively eroding in spots. The streambed is gravelly or sandy with large sized boulders. The stream is 6-12 inches deep during baseflow conditions and approximately 10-15 feet wide. Clearwater Creek was monitored in 2012 (Centennial High School), 2013 (ACD), and in 2015 (4-H group). After a gap, a Forest Lake Area Learning Center class started monitoring the site (2019-2022).

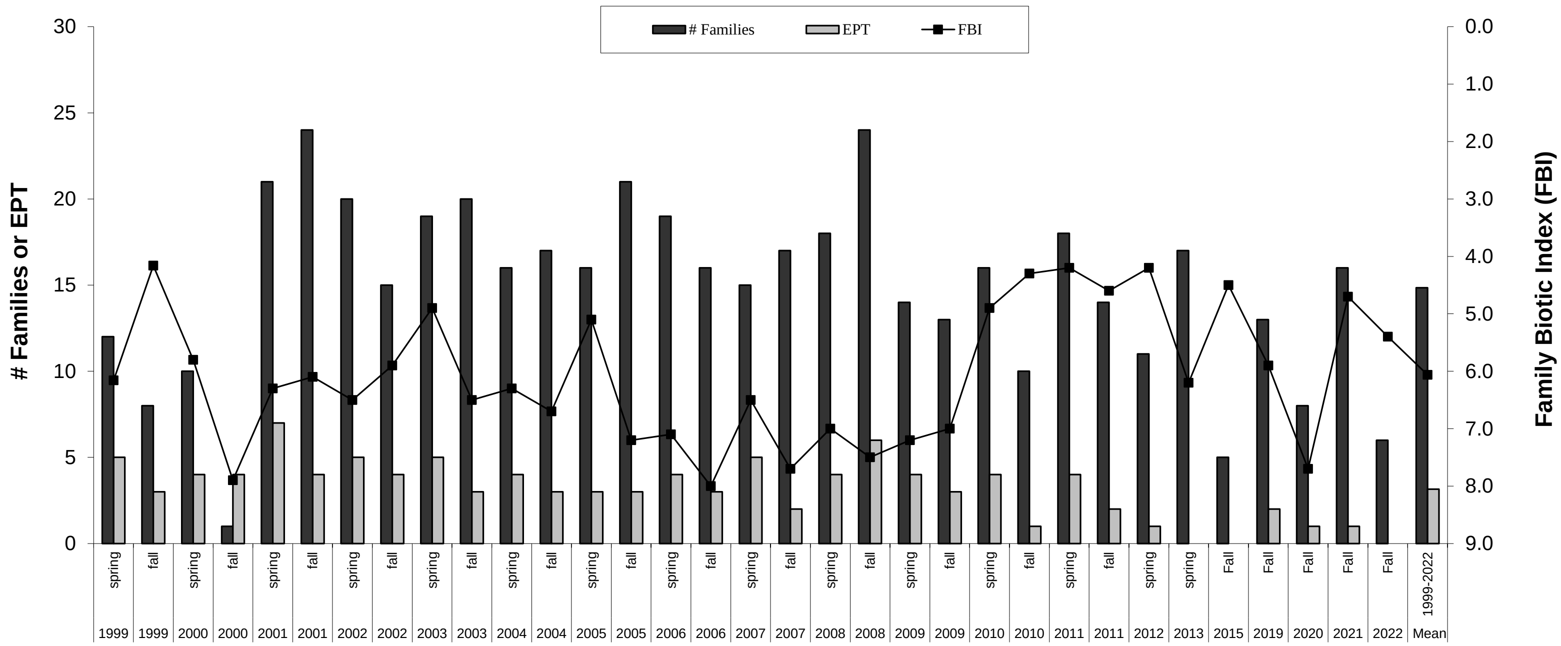
Results

Overall, this stream has had average or slightly below average stream health based on the invertebrate data collected. Since 2009, the FBI score has been lower (indicating an increase in pollution-intolerant species & better stream health) than the majority of previous years. This apparent improvement seems driven by the increased dominance of the invertebrate community by the amphipod families Gammaridae and Hyallelidae, which have moderate tolerance values. Prior to 2009 these families had not been dominant and more EPT taxa were present. Average number of sensitive EPT taxa has decreased from approximately four per year prior to 2009 to rarely more than two thereafter. So, while FBI scores indicate an apparent improvement in stream health, the number of EPT taxa indicate the opposite. On the whole, the invertebrate community is indicative of a less healthy condition than before 2009. Even before 2009 the invertebrate community reflected moderate at best stream health.

Discussion

Clearwater Creek's biological community is probably limited by a combination of habitat, hydrology, and water chemistry factors. This creek has been highly modified and large sections have been developed into a straightened ditch. Clearwater Creek is listed as impaired for dissolved oxygen as well as fish and invertebrate biota. Bald Eagle Lake, which is impaired for nutrients and serves as the Creek's headwaters, may be contributing to the low oxygen levels in the creek. An alum treatment was implemented in Bald Eagle Lake in 2014 and 2016 to reduce phosphorus levels and may help reduce oxygen demand in Clearwater Creek.

Summarized Biomonitoring Results for Clearwater Creek in Centerville



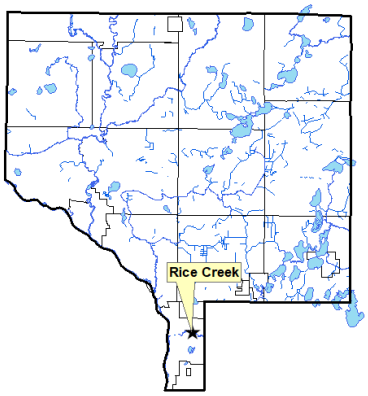
Biomonitoring Data for Clearwater Creek in Centerville

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

Year	2015	2019	2020	2021	2022	Mean
Season	Fall	Fall	Fall	Fall	Fall	1999-2022
FBI	4.5	5.9	7.7	4.7	5.4	6.1
# Families	5	13	8	16	6	14.8
EPT	0	2	1	1	0	3.2
Date	31-Aug	10-Oct	7-Oct	25-Oct	14-Oct	
sampling by	Anoka 4-H	FLALC	ACD	ACD	FLALC	
sampling method	MH	MH	MH	MH	MH	
# individuals	152	133	255	191	113	
# replicates	1	1	1	1	1	
Dominant Family	Gammaridae	Hyalellidae	Hyalellidae	Gammaridae	gammaridae	
% Dominant Family	65.7	36.1	90.2	74.3	69	
% Ephemeroptera	0	1.5	0.0	0.0	0	
% Trichoptera	0.0	26.3	0.4	1.6	0.0	
% Plecoptera	0.0	0.0	0.0	0.0	0.0	
% EPT	0	27.8	0.4	1.6	0	

Rice Creek

Highway 65, Rice Creek West Regional Trail Corridor, Fridley



Monitored Since

1999

Student Involvement

40 Students in 2022, approximately 1,400 students since 1999

Background

Rice Creek originates from Howard Lake in east central Anoka County and flows southwest through the Rice Creek Chain of Lakes, eventually reaching the Mississippi River. Sampling for invertebrates has been historically conducted in the Rice Creek West Regional Trail Corridor, which encompasses a large portion of the stream's riparian zone. The land around the sampling site is forested but outside of this wooded buffer, the watershed is highly urbanized and the creek receives stormwater runoff from a variety of urban sources. The streambed has a rocky bottom with pools and riffles.

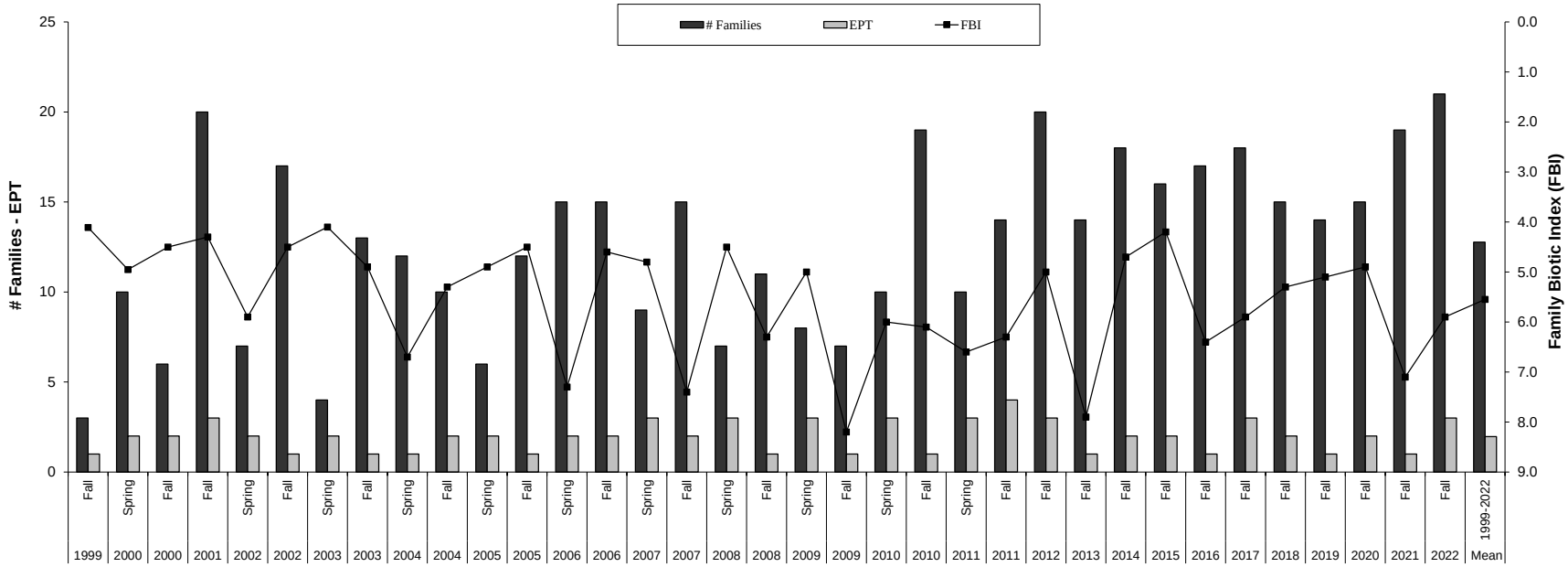
Results

Totino Grace High School classes monitored this section of stream in the fall of 2022, facilitated by the Anoka Conservation District. At this site, Rice Creek has a macroinvertebrate community indicative of poor stream health. While the number of families discovered in 2022 was an increase from previous years and above the long-term average for Anoka County streams, most are generalist species that can tolerate polluted water conditions, with a FBI value of 5.9 (fairly poor). Gammaridae was the dominant family found in 2022, but the dominant family found in seven of the past nine years was Hydropshychidae, a generalist family. The number of EPT families present has been below the county average in all years but increased to 3 families in 2022. EPT are generally pollution-sensitive, but the caddisfly family Hydropsychidae, is an exception to that rule. This family thrives in relatively poor environmental conditions and was once again a primary family found in 2022.

Discussion

The poor macroinvertebrate community in Rice Creek is likely due to poor water quality and the flashy flows observed during storm events, not poor habitat conditions. Habitat at the sampling site and the surrounding area is good, in part because of habitat improvement projects implemented in the past. The creek has diverse characteristics, containing runs, riffles, and pools. The area immediately surrounding the stream is predominately a buckthorn forest, with paved walking trails. However, outside of this wooded corridor, the watershed is urbanized and storm water inputs are likely influencing the degraded water quality. During storms events, water levels in the creek can rise quickly. This portion of Rice Creek is impaired for both fish and invertebrate biota.

Summarized Biomonitoring Results for Rice Creek at Hwy 65, Fridley



Biomonitoring Data for Rice Creek at Hwy 65

Data presented from the most recent monitored five years. Contact the ACD to request archive

Year	2018	2019	2020	2021	2022	Mean
Season	Fall	Fall	Fall	Fall	Fall	1999-2022
FBI	5.3	5.1	4.9	7.1	5.9	5.5
# Families	15	14	15	19	21	12.5
EPT	2	1	2	1	3	1.9
Date	15-Oct-18	15-Oct-19	12-Oct-20	12-Oct-21	11-Oct-22	
Sampled By	TGHS	TGHS	TGHS	TGHS	TGHS	
Sampling Method	MH	MH	MH	MH	MH	
# Individuals	509	322	240	326	256	
# Replicates	1	1	1	1	1	
Dominant Family	Hydropsychidae	Hydropsychidae	Hydropsychidae	Hydropsychidae	Gammaridae	
% Dominant Family	24.6	48.4	63.8	32.2	24.6	
% Ephemeroptera	14.5	0	4.6	0	2	
% Trichoptera	24.6	48.4	63.8	5.8	23.4	
% Plecoptera	0	0	0	0	0	
% EPT	39.1	48.4	68.4	5.8	25.4	

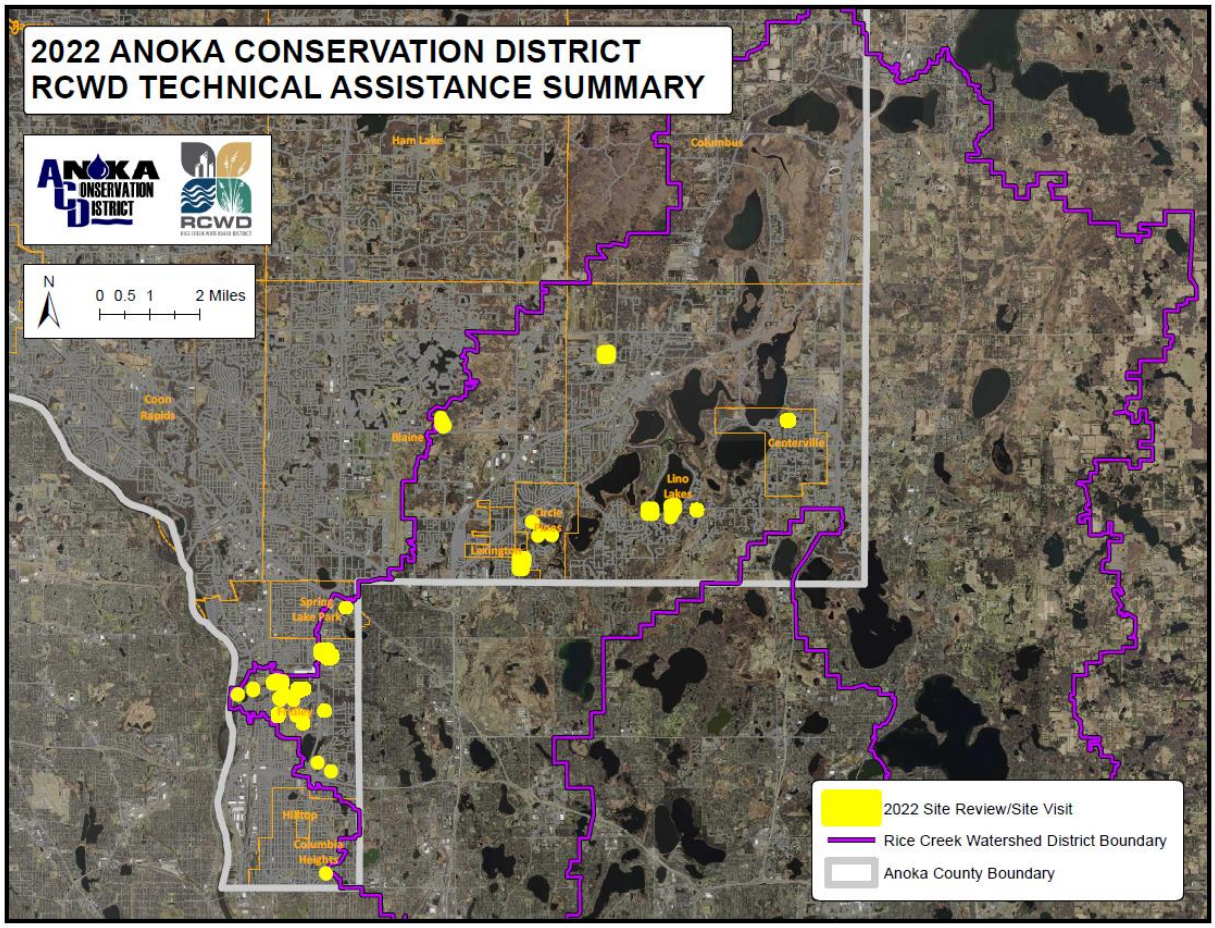
Water Quality Grant Administration

Description: RCWD contracted ACD to provide technical assistance for the RCWD Water Quality Grant Program. Tasks include landowner outreach and education, site reviews, site visits, project evaluations, Best Management Practices (BMP) design, cost-share application assistance, contractor selection assistance, construction oversight, long-term project monitoring, and other services as needed.

Purpose: To assist property owners within the Rice Creek watershed with the design and installation of water quality improvement BMPs.

Results: Formal property reviews/site visits were conducted at 31 sites throughout the Rice Creek Watershed in Anoka County. Project types included; 16 rain gardens, 3 lakeshore stabilizations, 1 streambank stabilizations, and 11 backyard habitat projects. Below is a summary of technical assistance provided in 2022.

2022 Sites within the Rice Creek watershed at which ACD provided technical assistance



Anoka County Water Resource Outreach Collaborative

Partners: ACD, Anoka County, WMO's, watershed districts, cities and townships

Description: The Anoka County Water Resources Outreach Collaborative (AWROC) is a partnership formed in 2018 to implement a comprehensive water outreach and engagement program. Its purposes are to reduce duplication while improving the cost effectiveness of public outreach about water resources.

Purpose: To inform community residents, businesses, staff, and decision-makers about issues affecting local waterbodies and groundwater resources. To achieve behavioral changes that improve water quality and recruit people to install water quality projects.

Location: County-wide

Results: Outreach included newsletter articles, social media, workshops, booths at community events and more. A highlighted output in 2022 was a video titled "Our River Connection." The video describes why watershed management is important and river stewardship principles. A "part 2" of the video is expected in 2023-24 that specifically addresses riverbank landowners, including topics of near shore habitat and erosion. Other previous videos in the series are "Our Lakeshore Connection" and "Our Groundwater Connection." All the videos are available on the Anoka Conservation District YouTube channel.