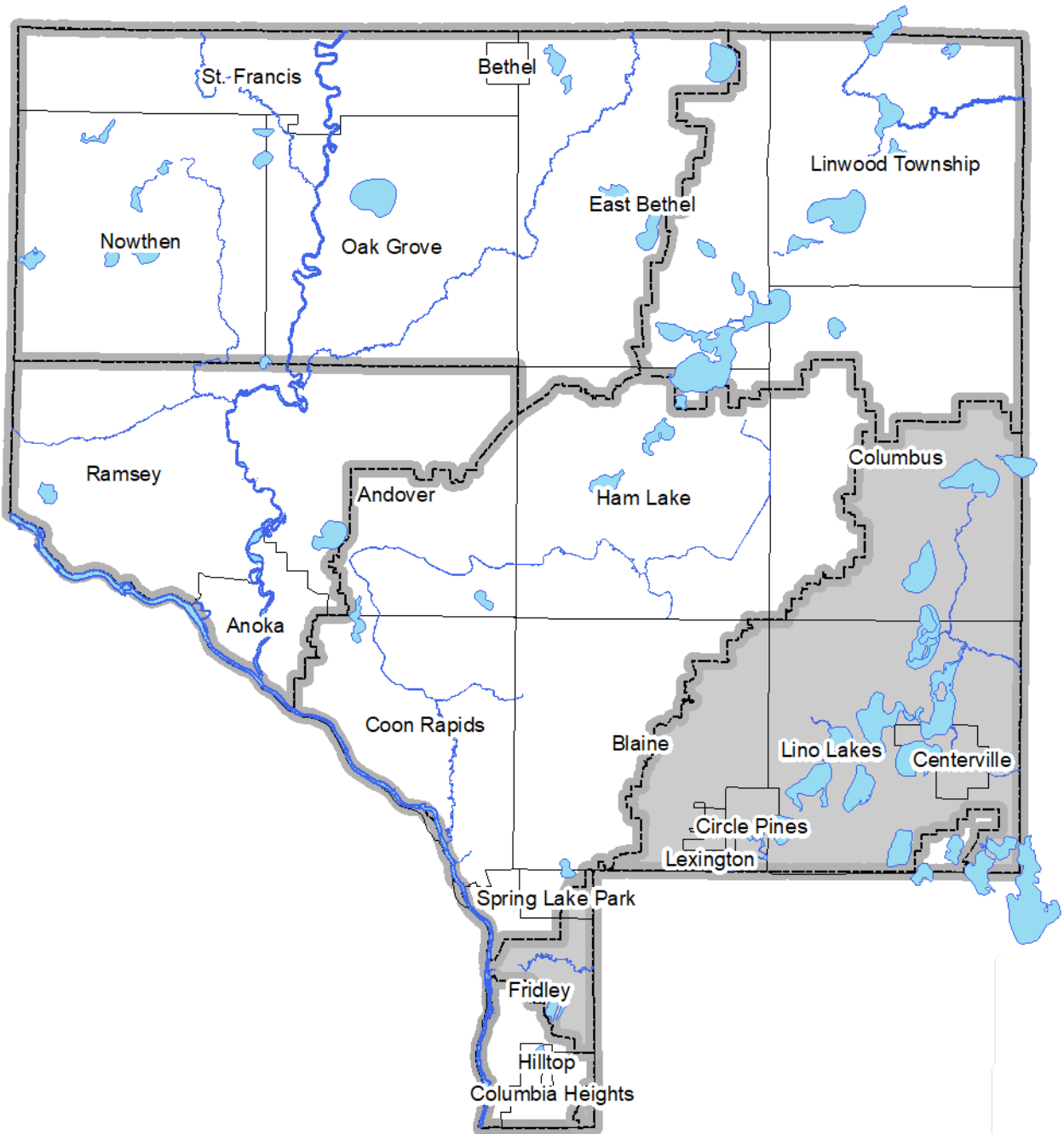


Excerpt from the 2023 Water Almanac

Chapter 5: Rice Creek Watershed



Prepared by the Anoka Conservation District

Table of Contents

Recommendations 3

Lake Level Monitoring..... 5

Wetland Hydrology 10

Stream Water Quality – Biological Monitoring..... 13

Clearwater Creek..... 14

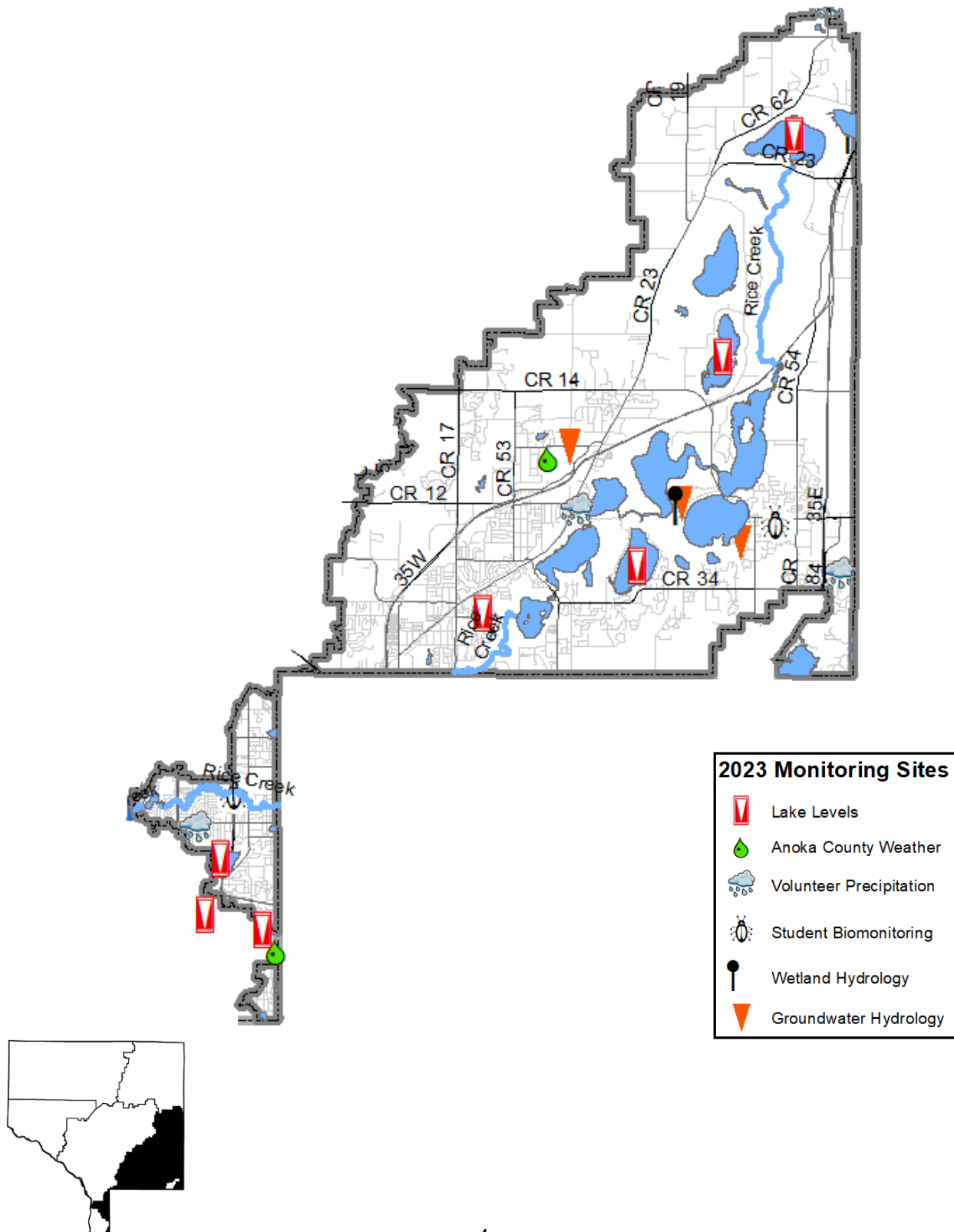
Rice Creek..... 16

Water Quality Grant Administration 18

Recommendations

- **Continue to install cost effective projects** identified in completed Subwatershed Retrofit Analyses. Projects identified in these studies would be ideal candidates for targeted outreach promoting 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.

2023 Water Monitoring Sites: Rice Creek Watershed



Lake Level Monitoring

Partners: RCWD, ACD, Volunteers

Description: Staff gages were installed by ACD, surveyed by the MNDNR and read weekly by local volunteers. 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 (<https://www.dnr.state.mn.us/lakefind/index.html>). 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.

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: **Howard.** In 2023, Howard Lake levels were found to be atypical. ACD is coordinating with the MNDNR to address potential discrepancies with survey elevation data. As a result, the data has not been included in this section.

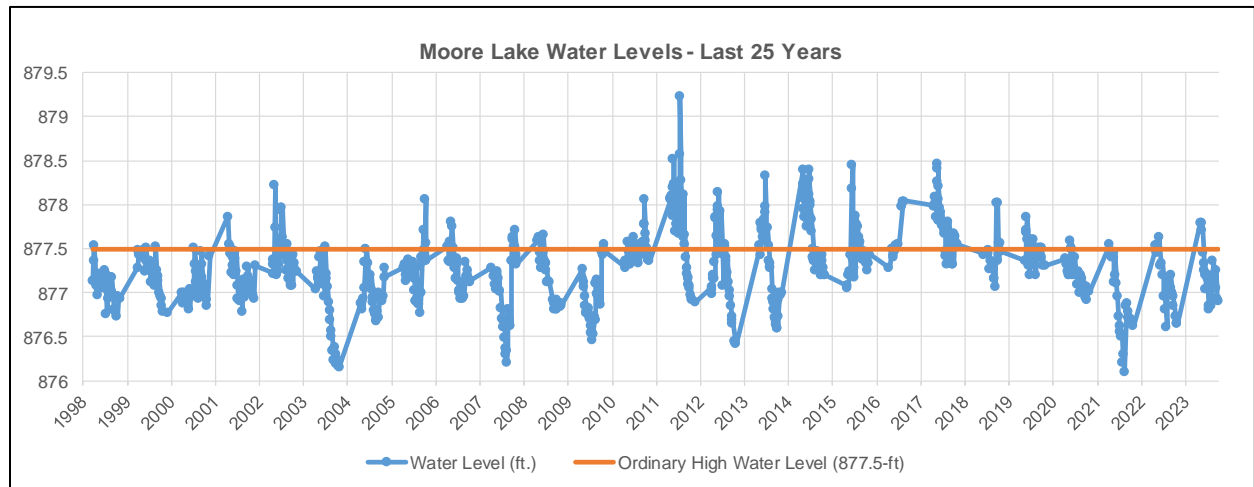
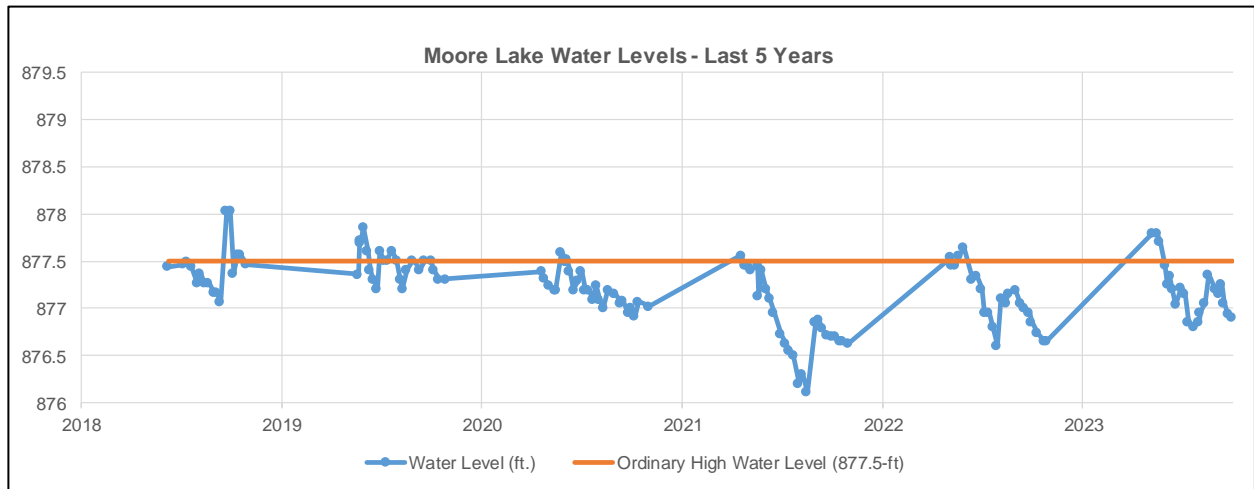
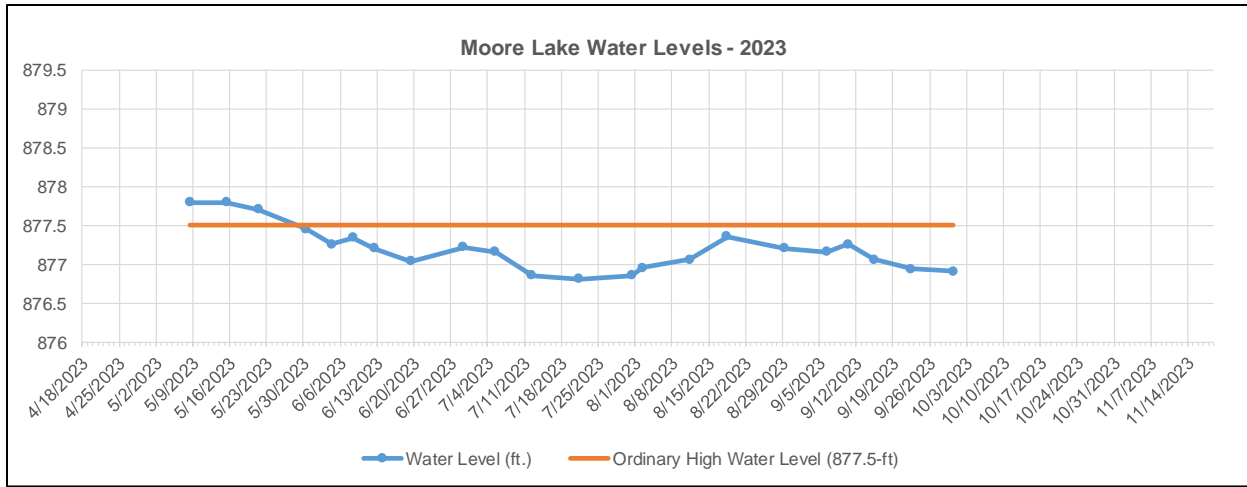
Moore. In 2023, Moore Lake levels were within the middle of the range historically observed, with a range of 0.99 feet. Lake levels have recovered from 2021 record lows. Moore Lake often observes a minor rebound in water levels in the fall, which also occurred in 2023.

Reshanau. In 2023, Reshanau Lake ranged 0.95 feet. Water levels were consistent with recent previous years with no noteworthy trend.

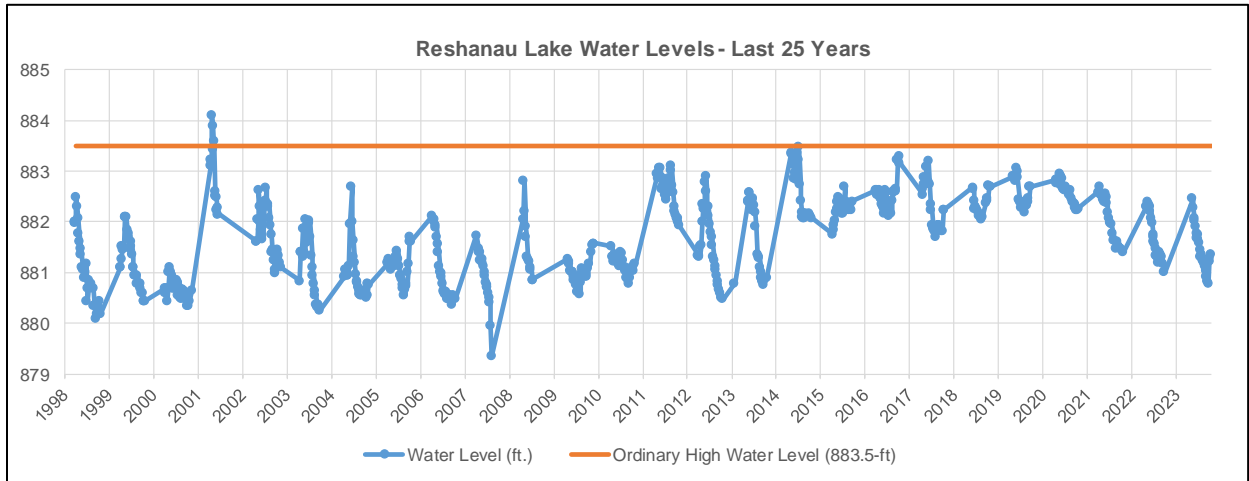
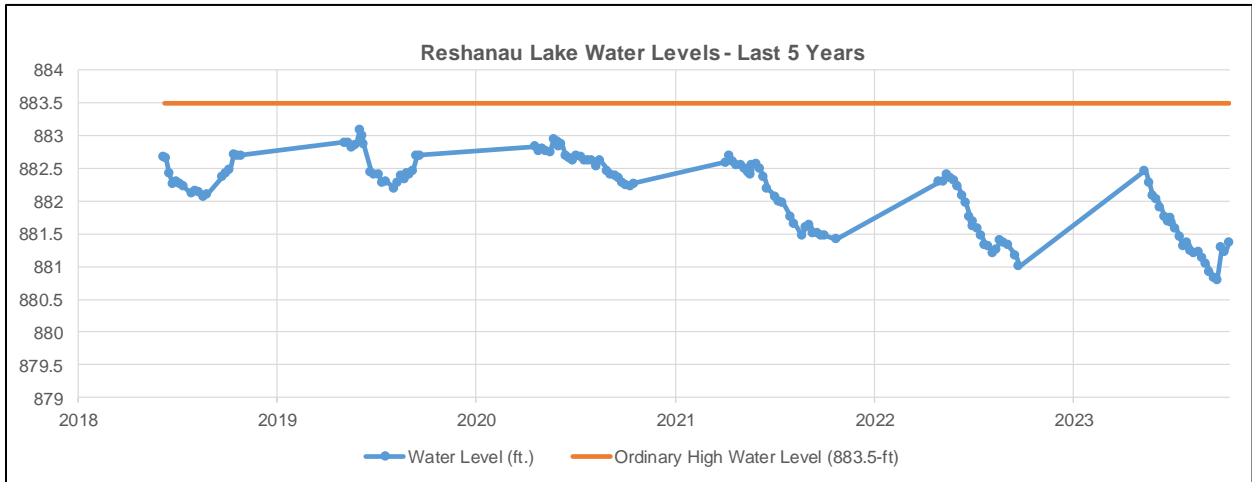
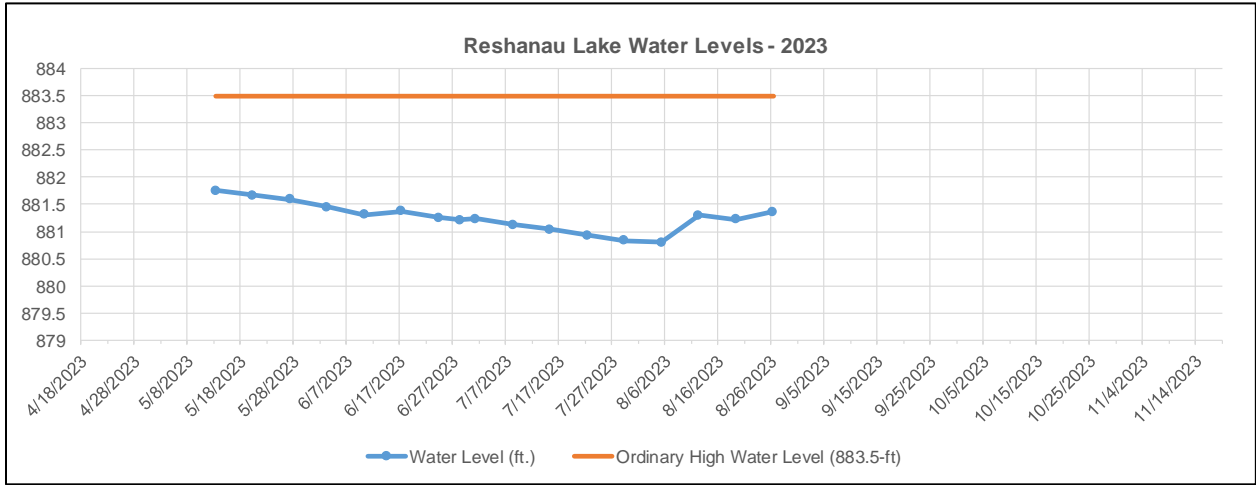
Rondeau. In 2023, Rondeau Lake levels ranged 0.62 feet. Water levels have reached historic low levels (record began in 1986) in 2021 and 2023. 2022 had only one reading. Water level monitoring at this lake began in 1986.

Golden. In 2023, Golden Lake levels ranged 0.98 feet. The lake experienced a significant rebound in water levels in the fall and were similar to values recorded in the early season. Water levels have recovered from 2021, when lake levels were the lowest recorded since 1989. This is despite drought in summer 2023.

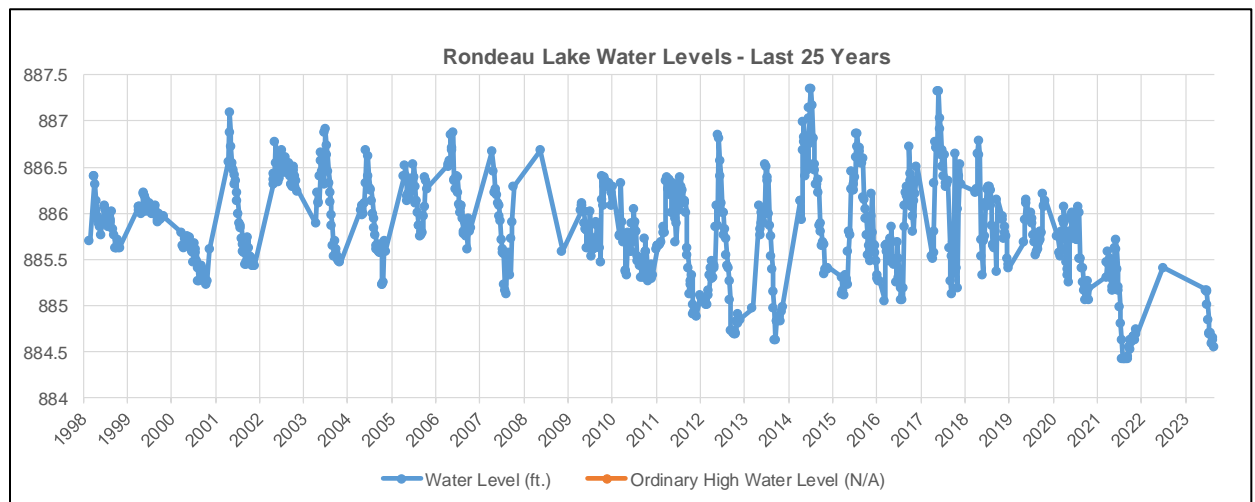
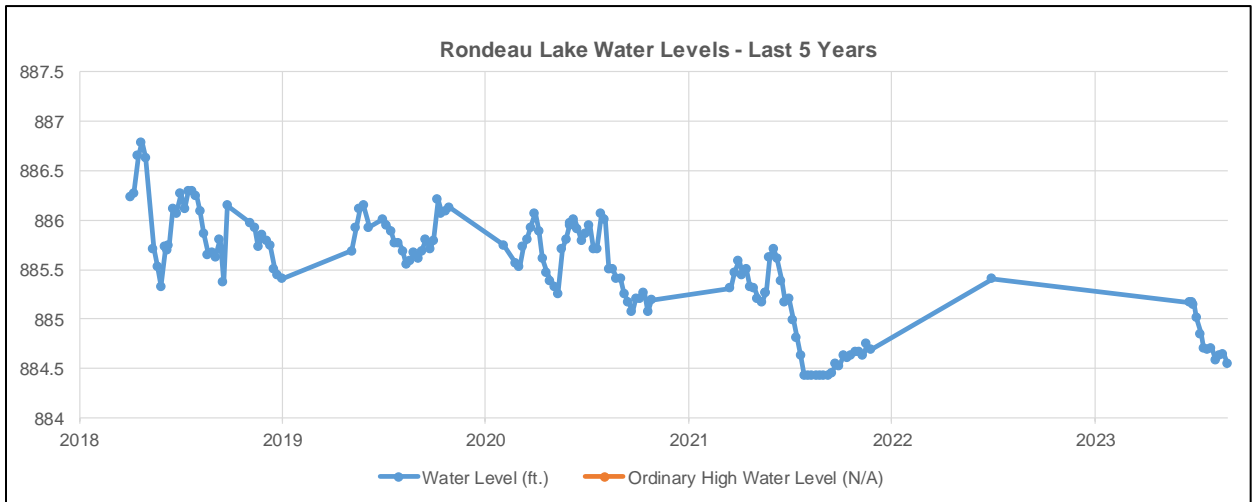
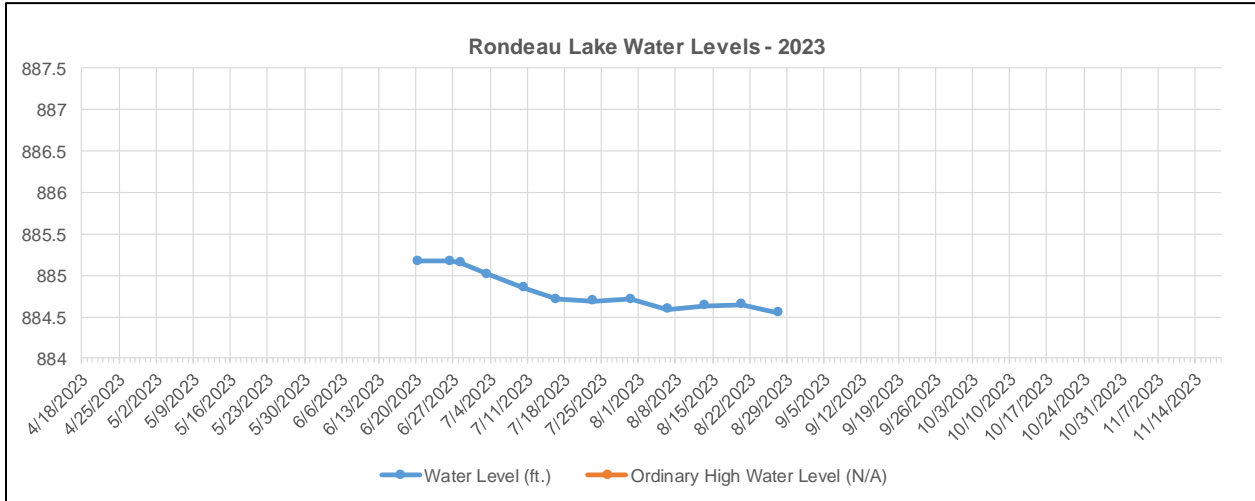
Moore Lake



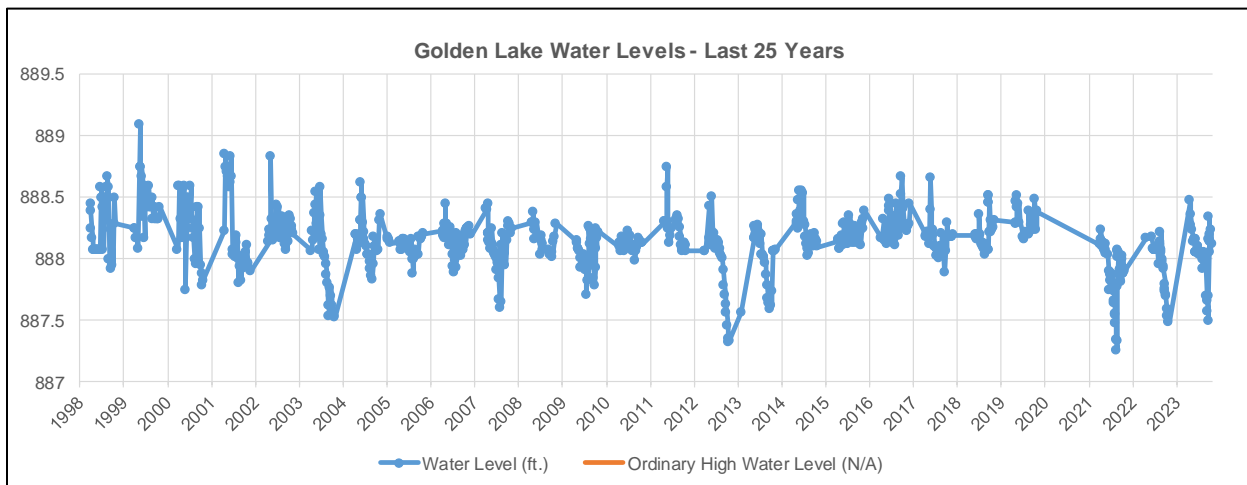
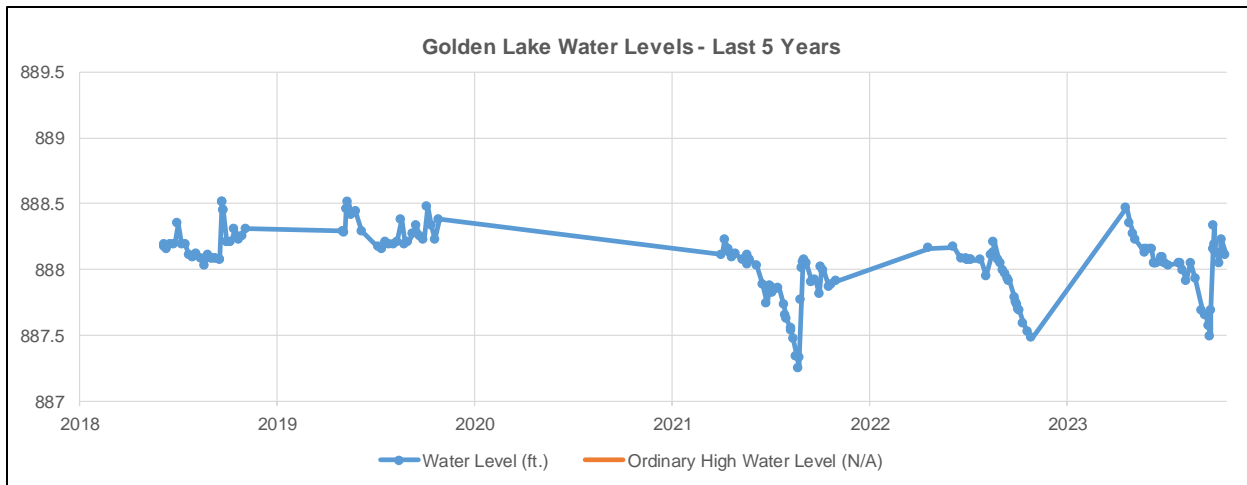
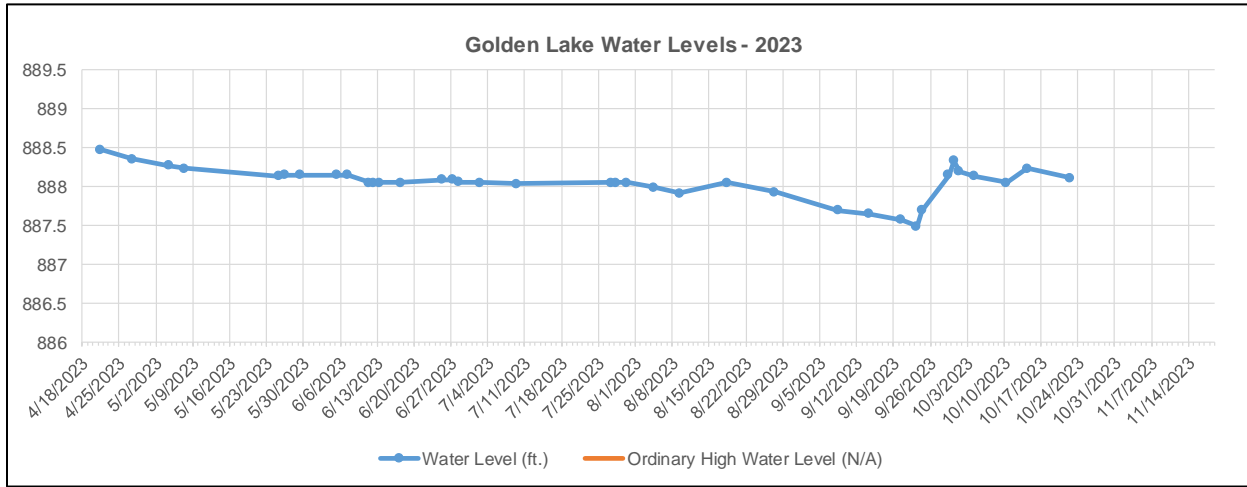
Reshanau Lake



Rondeau Lake



Golden Lake



Wetland Hydrology

Partners: RCWD, ACD

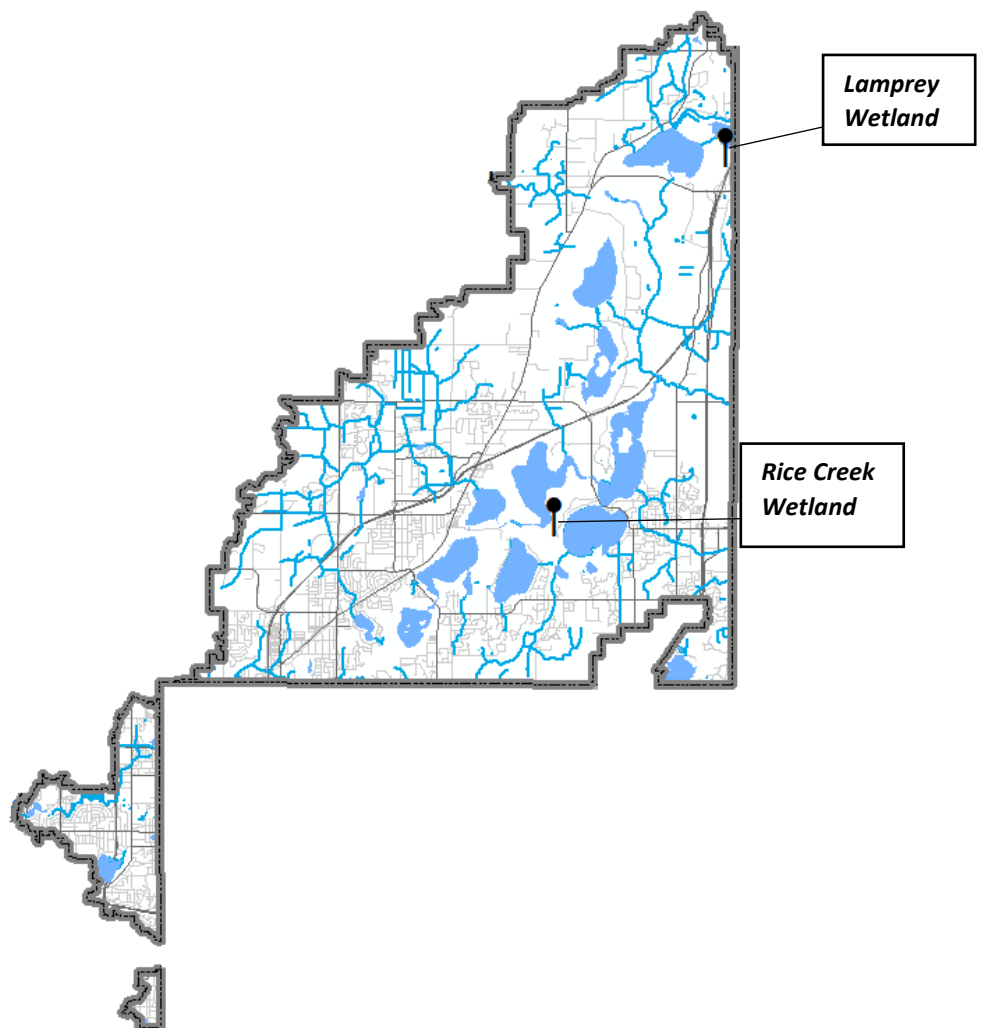
Description: Continuous groundwater level monitoring within wetland areas. Countywide, ACD maintains a network of 23 wetland hydrology monitoring stations.

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.

2023 Rice Creek Watershed Wetland Monitoring Sites

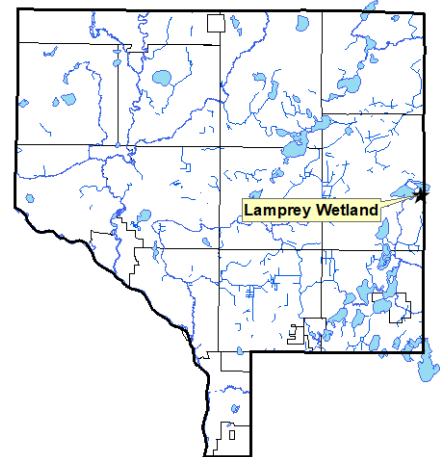


LAMPREY REFERENCE WETLAND

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:

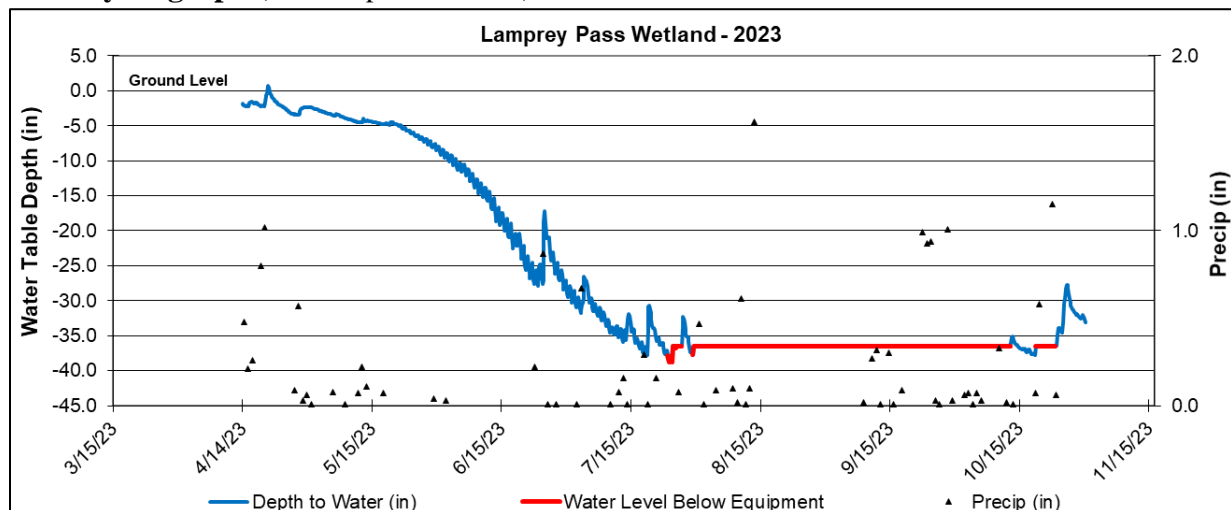
Horizon	Depth	Color	Texture	Redox
A	0-9	10yr 2/1	Fine Sandy Loam	-
AB	9-19	10yr 2/1	Fine Sandy Loam	2% 10yr 5/6
Bw	19-35	10ry 3/1	Loam	2% 10ty 5/4
2C1	35-42	5y 5/2	Clay Laom	5y 3/1 Organic Streaking
2C2	42-48	2.5y 5/1	Sandy Loam	2.5y 5/6

Vegetation at Well Location:

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

Other Notes: Wetland is within a state WMA and the boring is located at a wetland boundary. In 2023, Anoka County was abnormally dry or experiencing a state of drought.

2023 Hydrograph (Well Depth 40 inches)

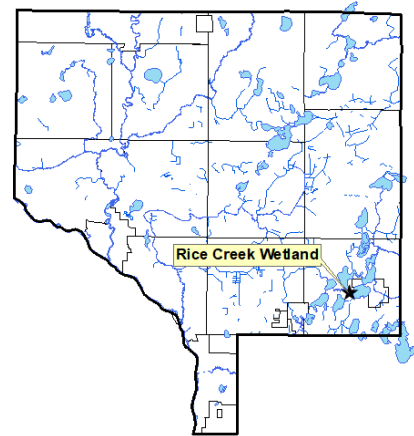


RICE CREEK REFERENCE WETLAND

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:

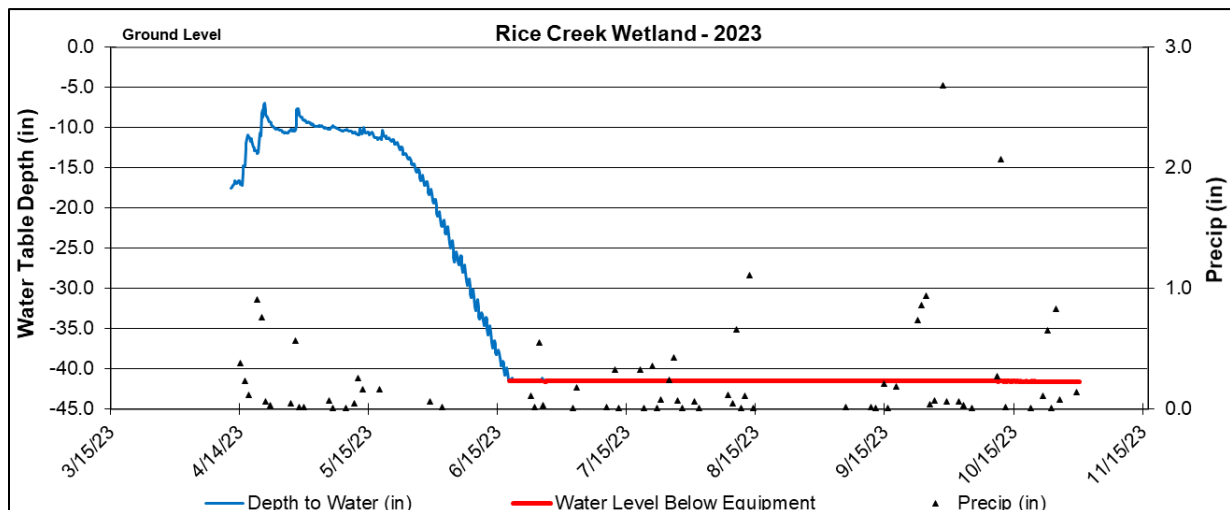
Horizon	Depth	Color	Texture	Redox
A	0-12	10yr 3/1	Sandy Loam	-
Ab	12-16	10yr 2/1	Sandy Loam	-
Bg1	16-21	10yr4/1	Sandy Loam	-
Bg2	21-35	10yr5/2	Sandy Loam	5% 10yr 5/6
2Cg	35-42	2.5y 5/2	Silt Loam	5% 10yr 5/6

Vegetation at Well Location:

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

Other Notes: Well is located at wetland boundary. In 2023, 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.

2023 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:

Families Number of Invertebrate families. Higher values indicate better quality.

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

Family Biotic Index (FBI) 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

Population Attributes Metrics **% 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

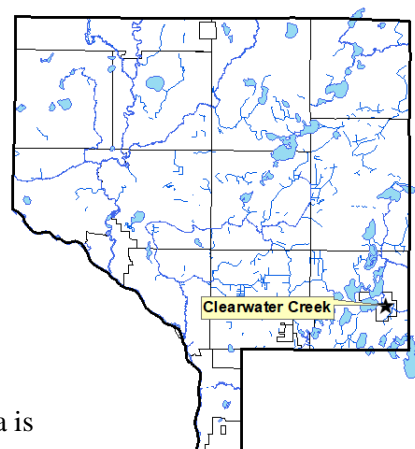
1999

Student Involvement

8 Students in 2023, approximately 676 students since 1999. Clearwater Creek was monitored in 2012 (Centennial High School), 2013 (ACD), and in 2015 (4-H group). After a gap, the Forest Lake Area Learning Center started monitoring the site (2019-2023).

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.



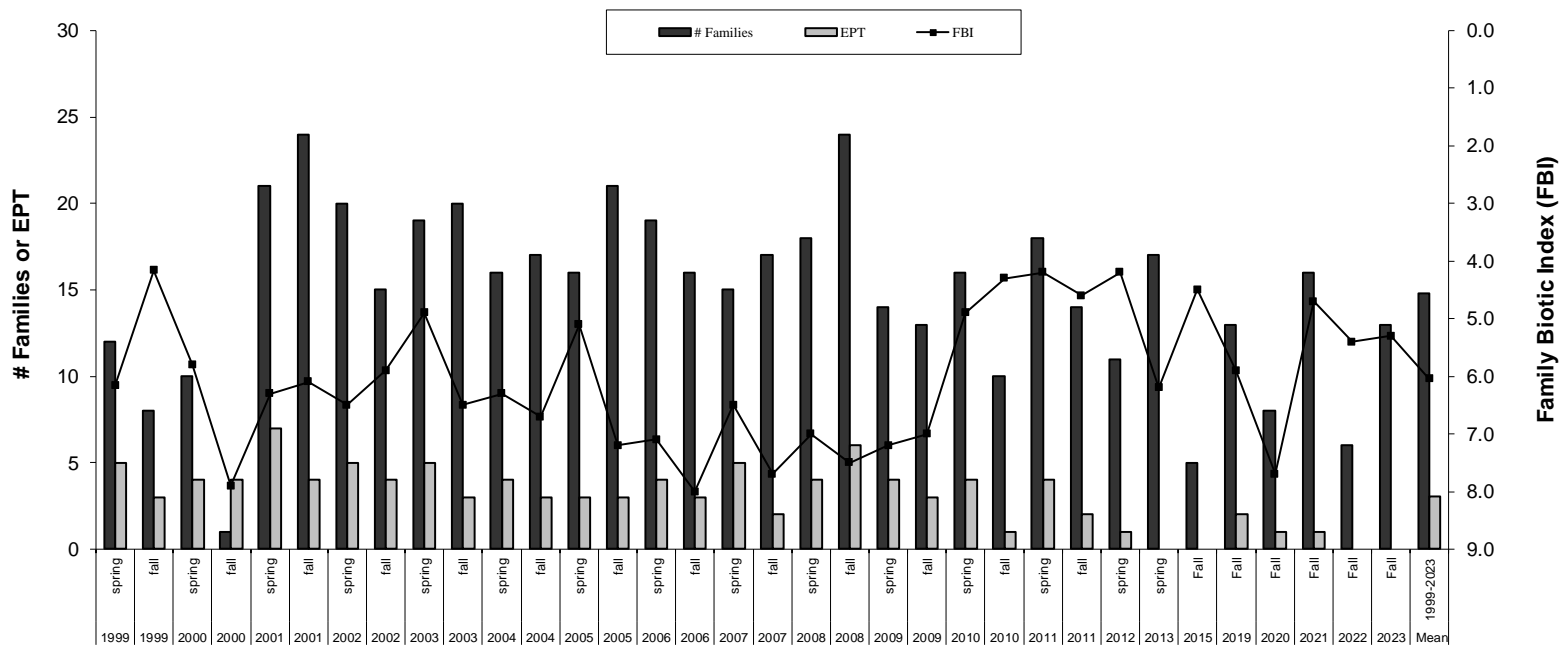
Results

Overall, this stream has had average or slightly below average stream health based on the invertebrate data collected. In 2023, students collected 13 different families of invertebrates, while 6 families were collected in 2022. 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	2019	2020	2021	2022	2023	Mean
Season	Fall	Fall	Fall	Fall	Fall	1999-2023
FBI	5.9	7.7	4.7	5.4	5.3	6.0
# Families	13	8	16	6	13	14.8
EPT	2	1	1	0	0	3.1
Date	10-Oct	7-Oct	25-Oct	14-Oct	16-Oct	
sampling by	FLALC	ACD	ACD	FLALC	FLALC	
sampling method	MH	MH	MH	MH	MH	
# individuals	133	255	191	113	138	
# replicates	1	1	1	1	1	
Dominant Family	Hyalellidae	Hyalellidae	Gammaridae	Gammaridae	Gammaridae	
% Dominant Family	36.1	90.2	74.3	69	59.4	
% Ephemeroptera	1.5	0.0	0.0	0	0	
% Trichoptera	26.3	0.4	1.6	0.0	0.0	
% Plecoptera	0.0	0.0	0.0	0.0	0.0	
% EPT	27.8	0.4	1.6	0	0	

Rice Creek

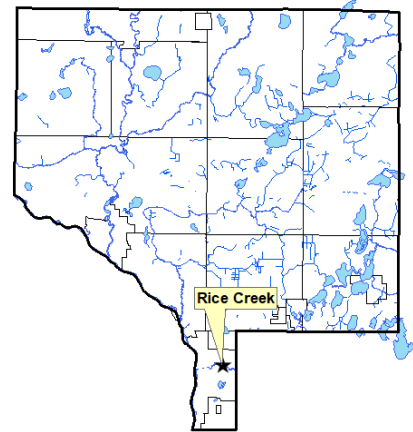
Highway 65, Rice Creek West Regional Trail Corridor, Fridley

Monitored Since

1999

Student Involvement

40 Students in 2023, approximately 1,440 students since 1999
This stream is monitored by Totino Grace High School, with facilitation from the Anoka Conservation District.



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.

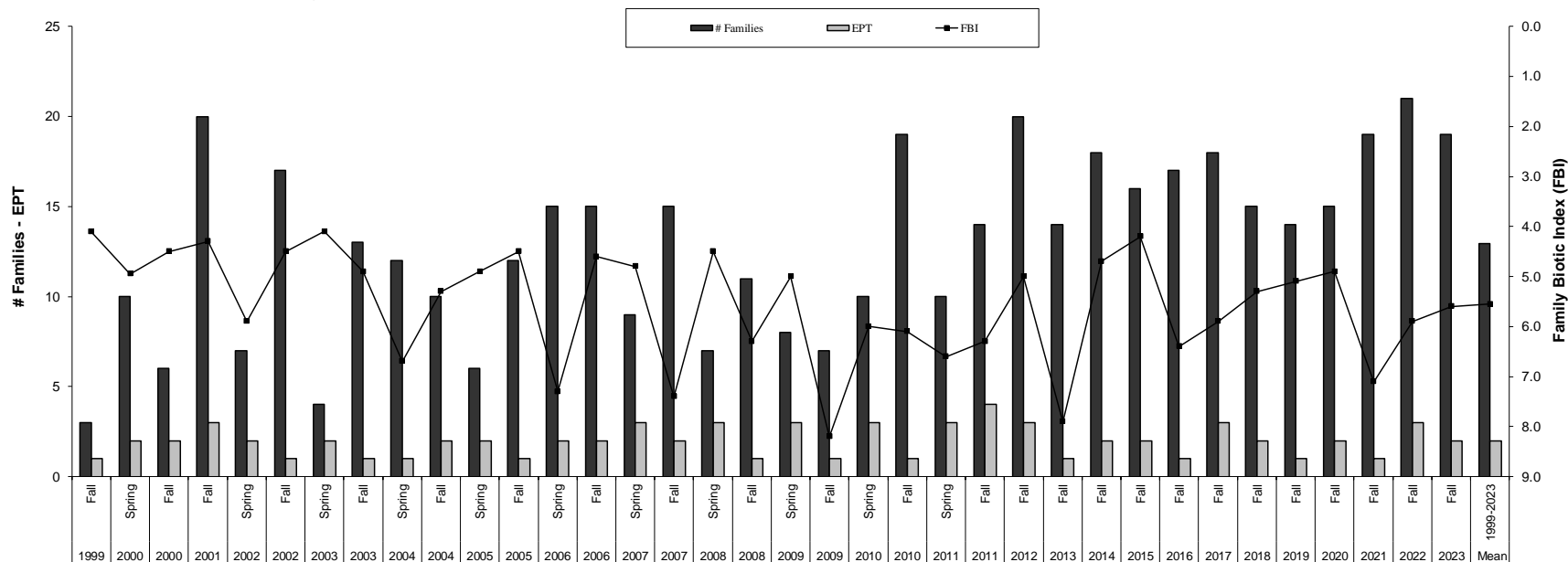
Results

At this site, Rice Creek has a macroinvertebrate community indicative of poor stream health. While the number of families found in 2023 is 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 both 2022 and 2023, but the dominant family found in seven of the past ten years was Hydropsychidae, a generalist family. The number of EPT families present has been below the county average in all years and decreased from 3 families in 2022 to 2 families in 2023. 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 2023.

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	2019	2020	2021	2022	2023	Mean
Season	Fall	Fall	Fall	Fall	Fall	1999-2023
FBI	5.1	4.9	7.1	5.9	5.6	5.5
# Families	14	15	19	21	19	12.9
EPT	1	2	1	3	2	2.0
Date	15-Oct-19	12-Oct-20	12-Oct-21	11-Oct-22	9-Oct-23	
Sampled By	TGHS	TGHS	TGHS	TGHS	TGHS	
Sampling Method	MH	MH	MH	MH	MH	
# Individuals	322	240	326	256	173	
# Replicates	1	1	1	1	1	
Dominant Family	Hydropsychidae	Hydropsychidae	Hydropsychidae	Gammaridae	Gammaridae	
% Dominant Family	48.4	63.8	32.2	24.6	43.9	
% Ephemeroptera	0	4.6	0	2	0	
% Trichoptera	48.4	63.8	5.8	23.4	0	
% Plecoptera	0	0	0	0	0	
% EPT	48.4	68.4	5.8	25.4	0.0	

Water Quality Grant Administration

Description: RCWD contracted ACD to provide technical assistance for the RCWD Water Quality Grant Program. Tasks include landowner outreach/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 24 sites throughout the Rice Creek Watershed in Anoka County. Project types included: 8 rain gardens, 7 lakeshore stabilizations, 1 streambank stabilizations, and 7 backyard habitat projects, and one for pet waste disposal stations in Moore Lake Park. Detailed reporting was separately provided to the watershed district.

2023 Sites within the Rice Creek watershed at which ACD provided technical assistance

