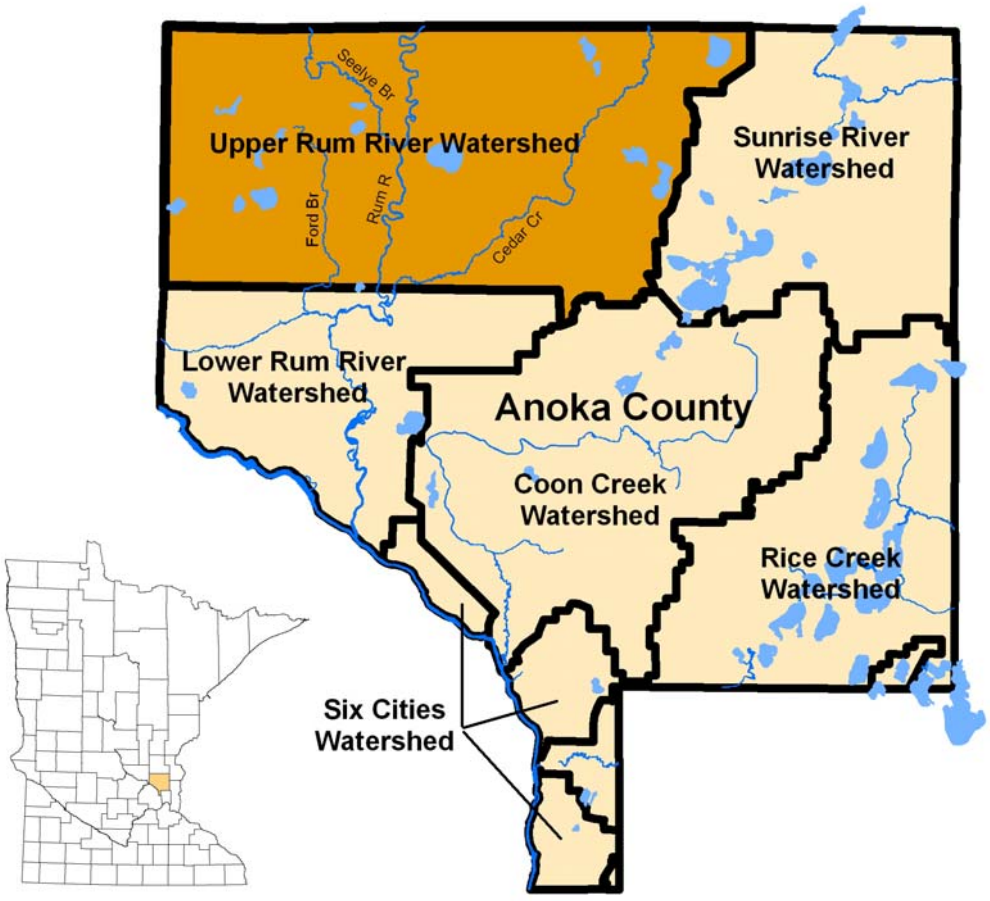
2008 Annual Report

Upper Rum River

Watershed Management Organization

Bethel - East Bethel – Ham Lake
Nowthen - Oak Grove – St. Francis



April 9, 2009

Table of Contents

I. Introduction

This report has been prepared to meet the annual watershed management organization reporting requirements of Minnesota Rules 8410.0150. The report is intended to fulfill 2008 reporting requirements.

The Upper Rum River Watershed Management Organization (URRWMO) is a joint powers organization under Minnesota Statutes, Section 471.59. It is comprised of the cities of Bethel, Oak Grove, Nowthen, and St. Francis, and portions of the cities of East Bethel and Ham Lake. Board members are appointed by the member cities. The organization's direction is laid out in its watershed management plan and the member municipalities' local water plans. The URRWMO meets quarterly on the first Tuesday of the month at 7pm at the Oak Grove City Hall.

II. Activity Report

a. Current Board Members

City Represented	Member	Position
Bethel	Todd Miller PO Box 15 Bethel, MN 55005 763-434-8331 tmiller@popp.net *Position filled by Ed Johnson in 2008*	Member
East Bethel	Greg Hunter 3719 Viking Blvd NE East Bethel, MN 55092 763-434-1534 eastbethelmayor@att.net *Position filled by Kathy Paavola in 2008*	Member
	Jared Trost 23016 Sunset Rd NE East Bethel, MN 55005 763-477-8309 trost010@umn.edu	Member
Ham Lake	Mary Ann Empson 700 173rd Ave NE Ham Lake, MN 55303 763-434-6034 maempson1@msn.com *Position filled by Bill Larson in 2008*	Member

Board Members (continued)

City Represented	Member	Position
Nowthen	Orval Leistico 21413 Nowthen Blvd Elk River, MN 55330 763-441-1959 ojnowthen@aol.com *Position filled by Randy Bettinger until July 7, 2008*	Member
	Melanie Kern 5300 Verde Valley Rd. Anoka, MN 55303 763-753-9609 furbootfarm@yahoo.com	Vice-Chair
Oak Grove	Ed Faherty 2847 Greenwald Island Cedar, MN 55011 763-753-3452 fahertyme@msn.com	Chair
	Will Ridge 21123 Lake George Blvd Cedar, MN 55011 763-753-1116	Member
St. Francis	Terry Sworsky 23355 Redwood Court NW St. Francis, MN 55070 763-753-2680 terrysworsky@earthlink.net	Member
	Steve Kane 23104 Guarani St NW St. Francis, MN 55070 763-753-3320 steve@steve-kane.com *Position filled by Ray Jones in 2008*	Member

b. Employees and Consultants

The URRWMO does not employ staff, but does utilize consulting services and enters into cooperative agreements with other government agencies. A description of contracted services is listed below:

Consultant/Partner	Contact	Work Description
Anoka Conservation District	Jamie Schurbon, Water Resource Specialist 16015 Central Ave NW, suite 103 Ham Lake, MN 55304 763-434-2030 ext. 12 jamie.schurbon@anokaswcd.org	• **Watershed plan amendment facilitation**, and related planning tasks. • Water monitoring and improvement projects. • Website maintenance. • Administer the WMO's cost share grants for water quality improvement projects. • Assistance preparing annual reports to BWSR. • Assistance reviewing local water plans.
Gail Gessner	Gail Gessner 4621 203rd Lane NW Oak Grove, MN 55303 763-753-2368 bethelgail@hotmail.com	• Recording secretary for meetings

c. Solicitations for Services

In 2008 we did not seek bids for work, such as water monitoring and secretarial services, but we do plan to seek proposals in 2009 for our 2010 work plan.

d. Implementation of Watershed Management Plan

The URRWMO Watershed Management Plan was last updated and approved by the Minnesota Board of Water and Soil Resources (BWSR) in 2007. Implementation of the updated plan also began in 2007. The new plan contains a detailed schedule of tasks that the URRWMO should accomplish each year in order to realize its goals. The table on the following two pages compares our planned work to our accomplished work.

Comparison of work planned in the URRWMO Watershed Management Plan (including amendments) and work accomplished by the URRWMO in 2007 and 2008. The 2009 work plan is also shown.

Task	Work Planned and Accomplished Each Year					
	2007		2008		2009	
	Planned	Accomplished	Planned	Accomplished	Planned	In 2009 Work Plan
Monitoring						
Lake Levels		Lake George East Twin Lake		Lake George East Twin Lake	Lake George East Twin Lake	Lake George East Twin Lake
Lake Water Quality			Lake George East Twin Lake	Lake George East Twin Lake		
Stream Water Quality			Cedar, Ford, and Seeyle Brooks to be monitored 1 year during 2008-2012		Rum River, 2 sites Cedar, Ford, and Seeyle Brooks to be monitored 1 year during 2008-2012	Rum River, 2 sites
Water Quality Improvement						
Water Quality Improvement Cost Share Fund		$1,000	$1,000	Carry over $1,990 from previous years	$1,000	Carry over $1,990 from previous years
Public Education						
Website or Newsletter	Annual newsletter	Maintained and updated URRWMO Website	Annual newsletter, Maintain and update website	Maintain and update URRWMO Website	Annual newsletter, Maintain and update website	Annual newsletter, Maintain and update website
Other Education		150 lakeshore landscaping brochures to Lake George Cons. Club				
Inventories and Studies						
Lakeshore Erosion Mapping		Mapped George and East Twin Lakes, sent technical assistance and cost share info to properties with erosion problems.				
Study groundwater levels, trends, water quality and capacity.					Work planned for 2010-2017.	Contributing $5,000 to County Geologic Atlas. Additional $2,830 in 2010.

continued on next page

	2007		2008		2009	
	Planned	**Accomplished**	**Planned**	**Accomplished**	**Planned**	**In 2009 Work Plan**
Review East Bethel's wetland management plan along TH65					Complete review	Not needed because development has not proceeded
Planning and Reporting						
Annual Report to BWSR	Write and submit	2006 Annual Report submitted March 27, 2007	Write and submit	2007 Annual Report submitted March 27, 2008 (this report)	Write and submit	2008 Annual Report (this report)
Draft and adopt Plan Amendments: ● Water quality standards ● Stormwater infiltration standards ● Wetland standards ● Water monitoring plan	Convene Technical Advisory Committee (TAC)	TAC was convened. Recommended standards were drafted by the TAC and accepted by the URRWMO Board.	Formal process to amend new standards to URRWMO Plan	Completed. Approved by BWSR 1-8-09. Adopted by the URRWMO 2-3-09.		
Develop template for member cities to annually report to URRWMO	Create reporting template		Create reporting template	Completed		
Review member cities' annual reports to the URRWMO			Review cities' reports	Done by URRWMO Bd	Review cities' reports	URRWMO Board will do
Review member city Local Water Plans, once revised			Review draft Local Water Plans for compliance with URRWMO Plan	Bethel and Nowthen draft Plans reviewed and approved	Review draft Local Water Plans for compliance with URRWMO Plan	Anticipate receiving remaining draft plans.
Review CCWD-URRWMO Boundary		CCWD initiated a boundary adjustment, URRWMO concurred, change accepted by BWSR	Review and adjust, if necessary, URRWMO Boundary with CCWD	Completed in 2007		
Update Joint Powers Agreement		Minor updates in progress		Minor updates in progress		
Set aside matching funds for future grants	$1,000	Unable – WMO plan completed after budgeting was done	$1,000	Unable to accomplish with current finance administration	$1,000	Unable to accomplish with current finance administration

e. Status of Local Plan Adoption and Implementation

All of the URRWMO member cities need to update their Local Water Plans so they are consistent with the URRWMO Watershed Management Plan within two years of the Board of Water and Soil Resource's (BWSR) approval of the URRWMO Plan. The URRWMO Watershed Management Plan was last updated in 2007, and the due date for local water plan revisions and adoption is April 25, 2009. In order to facilitate the process, the URRWMO has sent reminder e-mails to city administrators and planners, and provided them with the needed materials (WMO Plan, WMO Plan amendments, and state statute 103B.235 and rule 8410.0160 which specify local plan content). Several municipalities have already completed their Plan updates, while the remainder are still in process.

To track member cities' progress on local plan adoption and implementation, the URRWMO requires a brief annual report from each city and provides a template for this report. In addition to serving as a reporting tool, we hope that the template serves as a "to do" list for our cities. All six cities submitted a report for 2008. These reports are available upon request, and are summarized in the table below.

Status of city local water plans and some recent accomplishments toward plan implementation.

City of Bethel	
Local Water Plan Status	Bethel's new local water plan has been reviewed by the Metropolitan Council and URRWMO. The URRWMO approved the plan in February 2009. The City has indicated that several ordinance revisions are also planned to achieve consistency with URRWMO standards. Ordinances needing updates include erosion and sediment control, stormwater, floodplain, and wetlands.
Some Recent Implementation Accomplishments	• Educational efforts that reached 450 residents on the topics of hazardous waste disposal and yard waste management. • Street sweeping. • Development of a map that includes ponds, lakes, streams, wetlands, and major storm sewer crossings. • Development of an engineering manual with stormwater construction requirements.
City of East Bethel	
Local Water Plan Status	East Bethel's local water plan last updated in 2007, and is now being updated for consistency with the URRWMO Plan, with an anticipated completion of April 2009. The City has indicated that several ordinance reviews and possibly revisions are also planned to achieve consistency with the URRWMO standards. Ordinances needing review and possible update or creation include erosion and sediment control, stormwater, and wetlands (all will be addressed through update of the City's subdivision ordinance).
Some Recent Implementation Accomplishments	• Inventorying water control structures and storm water treatment basins is underway, with an anticipated completion of June 30, 2009. • Inspecting land disturbance activities weekly or after rain events. • Enforcing erosion and sediment control violations at the Davenport Street construction project. • Educational efforts that reached 11,000 residents on the topics of wetland buffers, hazardous waste disposal, and yard waste management.

City of Ham Lake	
Local Water Plan Status	Ham Lake's local water plan is currently being updated for consistency with the URRWMO Plan, with an anticipated completion of April 2009. The City already has all of the ordinances required by the URRWMO Plan, but these will be reviewed for consistency with the URRWMO standards during the process of updating the local water plan.
Some Recent Implementation Accomplishments	• Stormwater system illicit discharge detection and elimination through City ordinance 08-03. • Annual inspection of all structural pollution control devices, and maintenance based upon inspection reports. This includes 165 outlet baffles acting as pollution control devices for the stormwater collection and sedimentation ponds in the City. • Routine inspection of land disturbance activities. • Street sweeping by May 1 in the spring, once during summer, and other times as needed. • Inspection of 20% of MS4 outfalls, sedimentation basins, and ponds each year on a rotating basis. Any cleaning or maintenance is based on the inspection reports. • Educational efforts through the City's newsletter, which reaches the entire population of 14,000+. Educational article topics in 2008 included wetland buffers, water quality monitoring, groundwater protection, water conservation, hazardous waste disposal, and yard waste management. • Created guidelines for development and made them available to developers, community staff, and the city council.
City of St. Francis	
Local Water Plan Status	St. Francis' local water plan is currently being updated for consistency with the URRWMO Plan, with an anticipated completion of April 2009. The City has indicated that several ordinance reviews and possibly revisions are also planned to achieve consistency with the URRWMO standards. Ordinances needing review and possible update or creation include shoreland, stormwater, floodplain, and wetlands.
Some Recent Implementation Accomplishments	• Inspecting construction projects weekly or after rain events. • Street sweeping in both spring and fall. • Development of an inspection plan for stormwater treatment basins is underway. • Educational efforts that reached 3,000 residents on the topic of water conservation.
City of Nowthen	
Local Water Plan Status	Nowthen has updated its local water plan and sent a draft to the URRWMO for review. The URRWMO submitted minor comments back to the City in February 2009. The Metropolitan Council has indicated that they find the draft plan satisfactory. Final revisions and approvals are anticipated by April 2009. The City has indicated that several ordinance reviews and possibly revisions are also planned to achieve consistency with the URRWMO standards. Ordinances needing review and possible update or creation include erosion and sediment control, stormwater and wetlands (all will be addressed through update of the City's subdivision ordinance).
Some Recent Implementation Accomplishments	• City's Storm Water Pollution Prevention Plan (SWPPP) is on public notice. Adoption is anticipated for spring 2009, with implementation to begin thereafter. • Inspecting construction projects. • Street sweeping in areas with curb and gutter, including 188th lane 400' west of CR5, Garnett St south of CR24, 225th Ave, and 225th circle. • Educational efforts to residents on topics of hazardous waste disposal and yard waste management.

City of Oak Grove	
Local Water Plan Status	Oak Grove has updated its local water plan and sent a draft to the URRWMO for review. The URRWMO submitted comments back to the City in March 2009. The Metropolitan Council has indicated that they find the draft plan satisfactory. Final revisions and approvals are anticipated by April 2009. The City already has all of the ordinances required by the URRWMO Plan, but these will be reviewed for consistency with the URRWMO standards during the process of updating the local water plan.
Some Recent Implementation Accomplishments	• City is working with the MPCA on updates to their 2006 MS4 application and SWPPP. Approval is anticipated in the near future, with implementation to begin thereafter. • Inspecting construction projects, including enforcement action on failure to implement erosion and sediment control on a lakeshore lot. • Street sweeping in spring. • Educational efforts that reached 8,000 residents on the topics of wetland buffers, water conservation, hazardous waste disposal, and yard waste management.

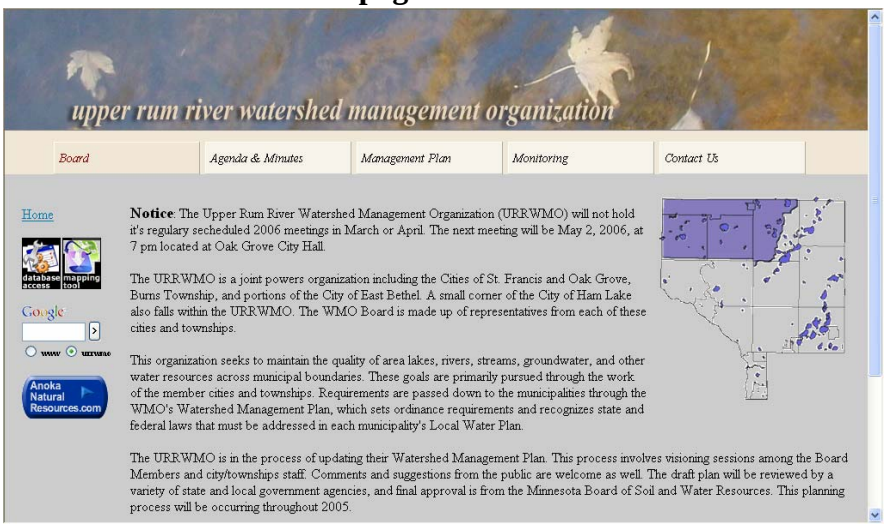
f. Public Outreach

The URRWMO and its member cities do occasional public outreach and education projects (see tables above), but the URRWMO's website serves as the primary, continuous public outreach tool. The website was designed in 2003 and has been in continuous operation since. Website contents include general information about the organization, the watershed management plan, meeting agendas and minutes, water monitoring results, profiles of WMO projects, access to mapping and data access tools, and others.

The website serves as an alternative to the state-mandated annual newsletter. The URRWMO ensures visibility of its website by asking member cities and townships to post the URRWMO website address in their newsletters. Links to the URRWMO website are also provided through other websites including the Anoka Natural Resources, Anoka Conservation District, and member municipality websites.

The website address is http://www.anokanaturalresources.com/urrwmo

URRWMO Website homepage



g. Permits, Variances, and Enforcement Actions

The URRWMO does not issue permits, variances, or take enforcement actions. These responsibilities are held by the member municipalities.

h. Status of Locally Adopted Wetland Banking Program

The URRWMO does not have a locally adopted wetland banking program.

i. 2009 Work Plan

Task	Purpose	Description	Locations or Action	Cost
Lake Level Monitoring	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.	Weekly water level monitoring in lakes by volunteers. All are available on the Minnesota DNR website using the "LakeFinder" feature (www.dnr.mn.us.state \lakefind\index.html).	East Twin Lake Lake George	$240
Stream Water Quality Monitoring	To detect water quality trends and diagnose the cause of changes. To measure upstream to downstream changes in water quality within the URRWMO area.	Grab sample water quality monitoring, including: total phosphorus, total suspended solids, chlorides, dissolved oxygen, turbidity, temperature, conductivity, pH, and salinity. Water level will be recorded during each sampling.	Rum River at Hwy 24 (top of URRWMO area) Rum River at Hwy 7 (bottom of URRWMO area).	$1,890
URRWMO Website	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. The website serves as the URRWMO's alternative to a state-mandated newsletter.	Maintain and update the URRWMO website with current information about the organization, and meeting minutes and agendas.	http://www.anokanaturalresources.com/urrwmo/	$260
URRWMO Annual Newsletter	To increase awareness of the URRWMO and its programs, as well as educate the public on water quality issues. A featured topic in the 2009 article will be cost share grants available to residents for water quality improvement projects.	In order to achieve the greatest distribution at the lowest cost the URRWMO will draft an newsletter article and ask that member cities include it in their newsletters.	Watershed-wide	$250
Prepare 2009 Annual Report to BWSR	To provide transparency and accountability of organization operations.	Produce an annual report of URRWMO activities and finances that satisfies Minnesota Rules 8410.0150.	Secured Anoka Conservation District staff to assist with this task.	$400

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Task	Purpose	Description	Locations or Action	Cost
Anoka County Geologic Atlas	To understand groundwater sensitivity, flow, sustainability, locations of aquifers, connections to surface water, and recharge.	A County Geologic Atlas is a map-based, systematic, detailed study of a county's geologic and ground-water resources. It includes study of both near-surface deposits and bedrock. Ground-water studies include direction and rate of flow, aquifer capacity, ground-water chemistry, and sensitivity to pollution. The atlas is created using drilling logs from thousands of wells around the county. The information is organized, analyzed, and displayed using GIS technology. The target audience is government agencies, particularly local government. Local committees help define the scope and products of each atlas project. The State of Minnesota is the primary funding source for this project, but watershed organizations are collectively providing a required local contribution of 6% of costs.	Financial contribution.	$5,000 (add-itional $2,830 in 2010)
Member Local Water Plan Review	To ensure city local water plans are consistent with the URRWMO, as required by law. This process also ensures that URRWMO goals are being met through city actions (this approach allows cities to retain greater control and flexibility).	The URRWMO Board and technical staff from the Anoka Conservation District will review draft local surface water management plans from each city as they are updated for compliance with the new URRWMO Plan. Reviews shall take place within the 60-day period allowed by MN Statutes 103B.235.	All six member cities Some reviews were already completed in 2008.	$2,400 (paid in 2008)
Cost Share Grants for Water Quality Improve-ment	To improve water quality in lakes, rivers, and streams.	These grants offer up to 50% cost sharing of the materials needed for a water quality improvement project. The landowner is responsible for the other 50% of materials, all labor, and any aesthetic components of the project. Typical projects include erosion correction, lakeshore restoration, and rain gardens. The Anoka Conservation District provides administration of grants and technical assistance to landowners.	Offer grants	Carry over $1,990 from previous years
Review member cities' annual reports to the URRWMO	To track member cities' progress on local plan adoption and implementation. In addition, we hope that the reporting template will serve as a "to do" list for our cities.	The URRWMO will review annual reports from member cities. Completed reports are due to the URRWMO by February 15 so the information can be included in the URRWMO's annual report to BWSR (this report).	Review of six cities' reports by URRWMO Board.	$0

III. Financial and Audit Report

a. 2008 Financial Summary

Expenditures and revenues for the year are detailed in the table below. Each municipality's contribution (WMO revenue) was based on property tax base, except that administrative costs are divided evenly.

Expenditures	**Amount**
Administrative	
Insurance – League of MN Cities Insurance Trust	$2,282.00
Insurance dividend – League of MN Cities Insurance Trust	- $135.00
Secretarial services - Gail Gessner	$525.00
City of Oak Grove administration fees	$516.72
SUBTOTAL	$3,172.72
Non-Administrative	
Water Monitoring (lake levels, lake water quality) - Anoka Conservation District (ACD)	$2,060.00
Website – ACD	$320.00
2007 annual report to BWSR – ACD	$400.00
Develop member city annual report template – ACD	$700.00
Develop water monitoring plan – ACD	$500.00
Member local water plan review	$2,400.00
Watershed plan amendments facilitation - ACD	$12,829.10
Plan amendments public notice in ABC newspapers – ACD	$71.75
SUBTOTAL	$19,280.85
GRAND TOTAL	$22,453.57

Revenues (% cost distribution specified in JPA)	**Amount**	
Administrative		
City of Bethel (16.67% of expenses)	$ 528.79	(16.67%)
Burns Township (16.67% of expenses)	$ 528.79	(16.67%)
City of East Bethel (16.67% of expenses)	$ 528.79	(16.67%)
City of Ham Lake (16.67% of expenses)	$ 528.79	(16.67%)
City of Oak Grove (16.67% of expenses)	$ 528.79	(16.67%)
City of St. Francis (16.67% of expenses)	$ 528.79	(16.67%)
SUBTOTAL		$3,172.72
Non-Administrative		
City of Bethel (1.08% of expenses)	$ 213.22	(1.11%)
City of Nowthen (23.66% of expenses)	$4,566.96	(23.69%)
City of East Bethel (24.21% of expenses)	$4,672.67	(24.23%)
City of Ham Lake (0.99% of expenses)	$ 195.89	(1.02%)
City of Oak Grove (29.69% of expenses)	$5,699.21	(29.56%)
City of St. Francis (20.37% of expenses)	$3,932.88	(20.40%)
SUBTOTAL		$19,280.85
GRAND TOTAL		$22,453.57

b. Fund Balances

The URRWMO's general fund balance at the end of 2008 was $0. Revenues matched expenditures.

The URRWMO contributes to a fund for cost share grants for water quality improvement projects. This is part of a larger county-wide fund administered by the Anoka Conservation District. URRWMO dollars can only be awarded to projects in the URRWMO area. The fund balance history is:

2006 URRWMO Contribution	+	$ 990.00
2006 Expenditures		$ 0
2007 URRWMO Contribution	+	$1,000.00
2007 Expenses		$ 0
2008 URRWMO Contribution	+	$ 0
2008 Expenses	-	$ 0
Fund Balance		**$1,990.00**

a. 2008 Financial Audit Documentation

All revenues and expenditures are administered through the City of Oak Grove, 19900 Nightingale St. NW Cedar, MN 55011. The City of Oak Grove has undergone a complete financial audit yearly by a certified accounting firm, but the 2008 audit, which includes an audit of the URRWMO will not be completed until June 2009. When completed the audit will be available for review at the City of Oak Grove. The audits are conducted by:

Daniel C. Etling, CPA
Kern, DeWenter, Viere, Ltd.
763-569-5773 phone
detling@kdv.com email
http://www.kdv.com

b. 2009 Budget

The URRWMO has approved the following budget for 2009:

Copies	$ 75.00
Postage	$ 75.00
Recording Secretary	$ 1,200.00
Insurance	$ 2,500.00
2009 Work Plan (detailed earlier in this report)	$ 8,980.00
	$13,130.00

Since this budget was created on September 2, 2008, the URRWMO secured memorandums of understanding with the ACD for the work plan, with actual expenses totaling $8,040.

Appendix A:

2008 Water Monitoring and Management Work Results

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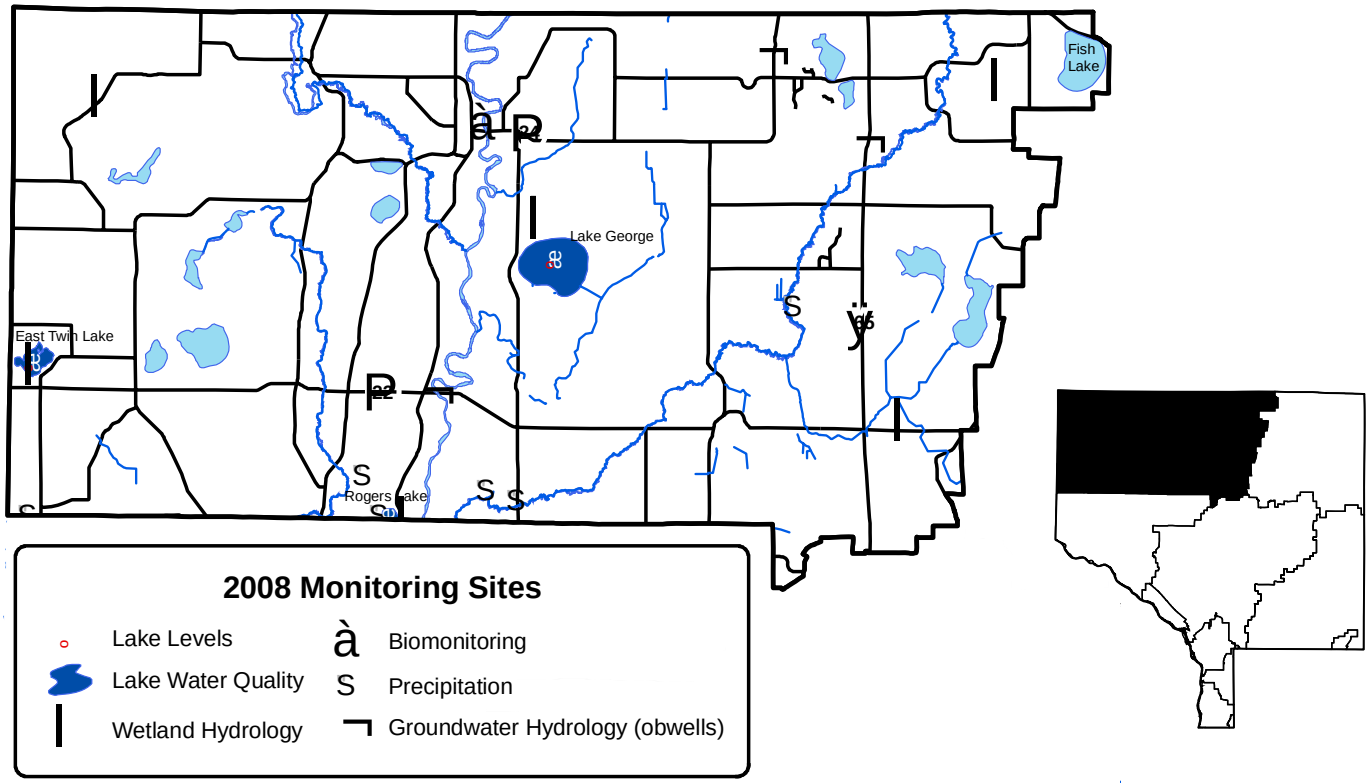
2008 WATER MONITORING AND MANAGEMENT WORK RESULTS

Task	Partners	Page
Lake Levels	URRWMO, ACD, MN DNR, volunteers	2
Lake Water Quality	URRWMO, ACD, ACAP	3
Stream Water Quality – Biological	ACD, ACAP, St. Francis High School	8
Stream Water Quality – WOMP Program	ACD, MC	11
Wetland Hydrology	ACD, ACAP	12
Water Quality Improvement Projects	URRWMO, ACD, Landowners	18
Homeowner's Guide	ACD	19
URRWMO Website	URRWMO, ACD	20
Landcover Update	ACD, ACAP	22
URRWMO 2007 Annual Report to BWSR	URRWMO, ACD	23
Review of Municipal Local Water Plans	URRWMO, ACD	24
URRWMO Watershed Plan Amendments	URRWMO, ACD	25
Recommendations		26
Groundwater Hydrology (obwells)	ACD, MNDNR	Contact ACD
Precipitation	ACD, volunteers	Contact ACD

ACAP = Anoka County Ag Preserves, ACD = Anoka Conservation District, MC = Metropolitan Council
MNDNR = Minnesota Dept. of Natural Resources, URRWMO = Upper Rum River Watershed Mgmt Org



Lake Levels

Description: Weekly water level monitoring in lakes. These data, as well as all additional historic data are available on the Minnesota DNR website using the "LakeFinder" feature (www.dnr.mn.us.state\lakefind\index.html).

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

Locations: East Twin Lake, Lake George, Rogers Lake

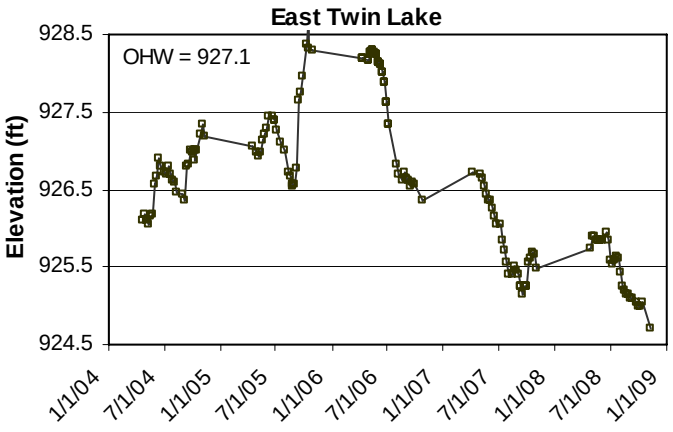
Results: Water levels on Lake George, Rogers, and East Twin Lakes were measured 14, 23, and 26 times, respectively, by volunteers. All three lakes declined throughout summer, as is typical.

East Twin Lake had lower water in 2007 and 2008 compared to the preceding six years (2001-06), when water was rising and high. Residents near the lake indicated that a beaver dam was the reason for the higher water, and that the beavers were removed in 2006. By the end of 2008 water was four feet lower than in highest recorded level in October 2005.

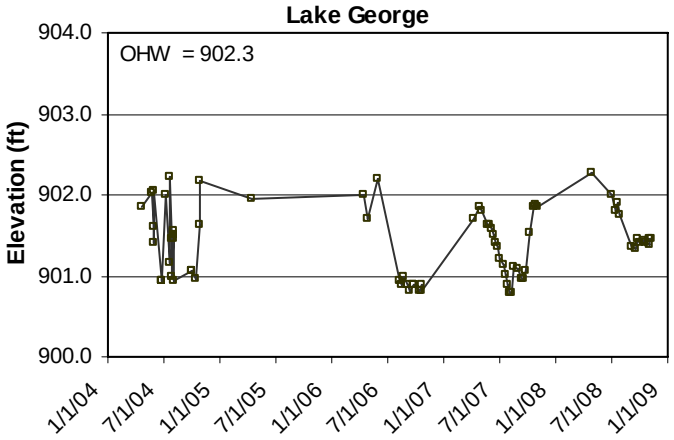
Lake George experienced low water levels in 2006 and 2007, but was somewhat higher in 2008. In 2007, when the mid-summer drought occurred, Lake George had the lowest water since the severe droughts of the late 1980's. In 2008 water levels were maintained about 1 foot higher than in 2006 or 2007. Management of the lake's only inlet, County Ditch #19, is of interest - residents have complained it is clogged and needs maintenance.

Ordinary High Water Levels (OHW), the elevation below which a DNR permit is needed to perform work, are listed for each lake on the graph below.

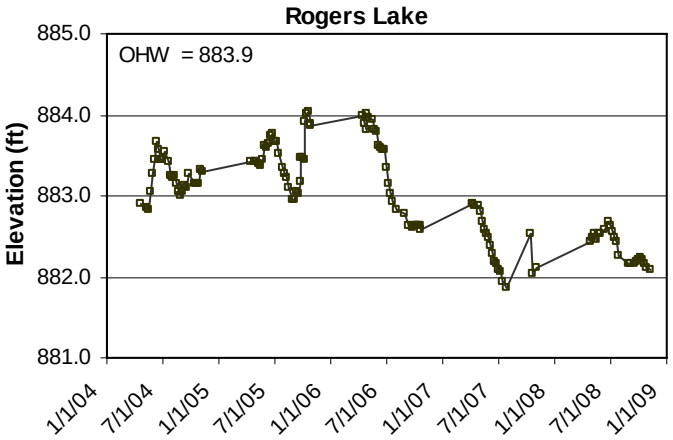
East Twin Lake Levels 2004-2008



Lake George Levels 2004-2008



Rogers Lake Levels 2004-2008



Upper Rum River Watershed Lake Levels Summary

Lake	Year	Average	Min	Max
East Twin	2004	926.67	926.05	927.33
	2005	926.67	926.05	927.33
	2006	927.61	926.37	928.29
	2007	925.79	925.15	926.71
	2008	925.45	924.70	925.94
George	2004	901.48	900.95	902.22
	2005	not available		
	2006	901.13	900.82	902.20
	2007	901.36	900.78	901.88
	2008	901.60	901.33	902.27
Rogers	2004	883.22	882.82	883.66
	2005	883.48	882.95	884.04
	2006	883.28	882.59	884.02
	2007	882.19	881.79	882.91
	2008	882.36	882.09	882.69

Lake Water Quality

Description: May through September twice-monthly monitoring of the following parameters: total phosphorus, chlorophyll-a, Secchi transparency, dissolved oxygen, turbidity, temperature, conductivity, pH, and salinity.

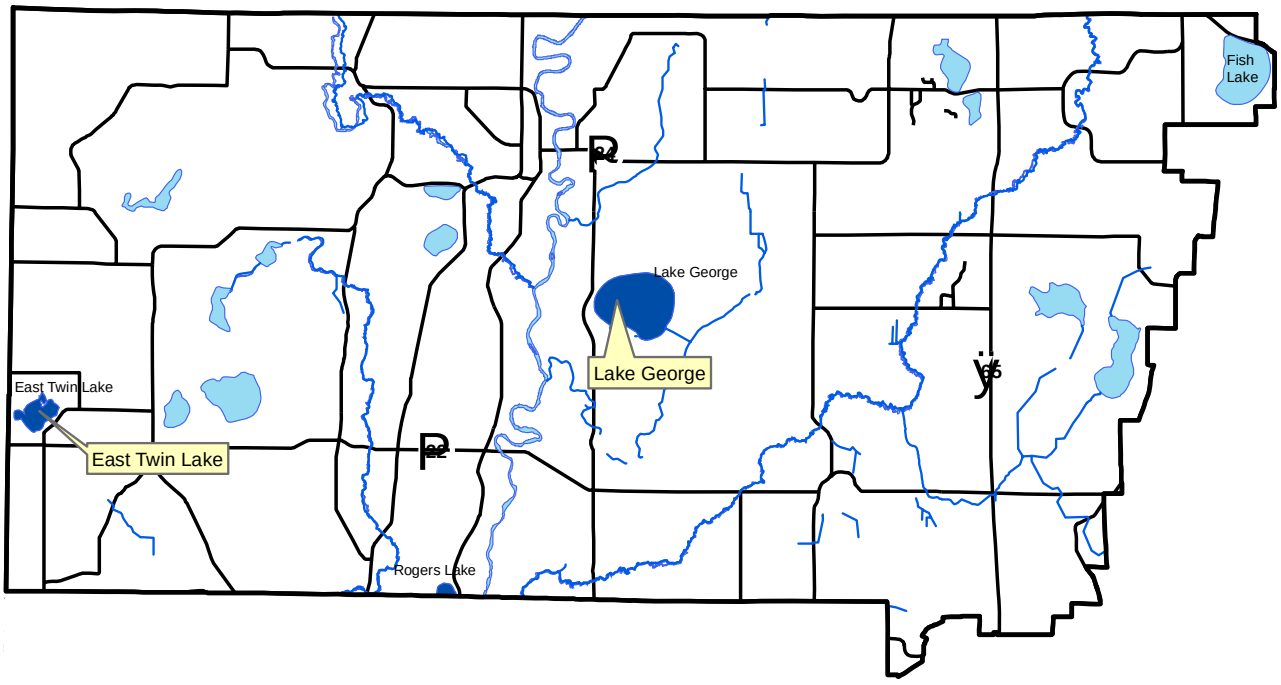
Purpose: To detect water quality trends and diagnose the cause of changes.

Locations: East Twin Lake,

Lake George

Results: Detailed data for each lake are provided on the following pages, including summaries of historical conditions and trend analysis. Previous years' data are available at www.AnokaNaturalResources.com. Refer to Chapter 1 for additional information on interpreting the data and on lake dynamics.

Lake Water Quality Monitoring Sites



East Twin Lake

BURNS TOWNSHIP, LAKE ID # 02-0133

Background

East Twin Lake is located on Anoka County's western boarder in the City of Nowthen. The lake has a surface area of 116 acres with a maximum depth of 77 feet (20.1 m), making it Anoka County's deepest lake. Public access is from East Twin Lake City Park, where there is both a swimming beach and boat launch. The lakeshore is only moderately developed, with residences being mostly of low density and encompassing about half of the lake. The watershed is >75% undeveloped, with low-density residential areas. This lake is one of the clearest in the county. One exotic invasive plant is known to this lake, curly-leaf pondweed.

2008 Results

In 2008 East Twin Lake had excellent water quality for this region of the state (NCHF Ecoregion), receiving an overall A grade; the same as in 10 of the previous 11 years monitored. The lake is mesotrophic. Of particular notability is the 22 ft Secchi transparency on May 28, 2008 and 20 ft in spring 2002; these are the deepest at any Anoka County lake since at least 1996. Even later in summer, transparency was >10 ft. Throughout summer total phosphorus held relatively steady at <22 ug/L and chlorophyll-a was consistently at <6 mg/L. These are low and considered excellent. Subjective observation by ACD staff ranked physical and recreational conditions optimal.

Trend Analysis

Twelve years of water quality data have been collected by the Metropolitan Council (1980, '81,'83, '95, and '98), the Minnesota Pollution Control Agency (1989), and the Anoka Conservation District (1997, '99, 2000, 2002, 2005, and 2008). Water quality significantly improved from 1980 to 2008 (repeated measures MANOVA with response variables TP, Cl-a, and Secchi depth, $F_{2,9}$= 7.31, p=0.01). One-way ANOVAs revealed that reduction in chlorophyll-a is the most important factor in this trend, but total phosphorus reductions also occurred. Secchi transparency changes have been minimal. The improvements have been small and slow, and not likely noticed by most lake users. The most obvious differences are from the 1980's data and the post-1980's data.

Discussion

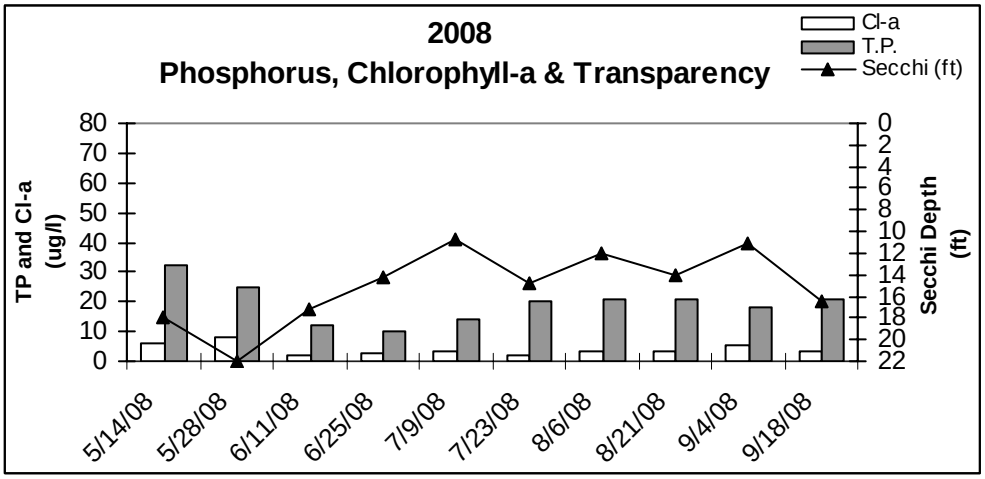
The ecology of this lake is different from that of many other Anoka County Lakes because it is deep. Sediment and dead algae can sink to the bottom and are essentially lost from the system because resuspension by wind, rough fish, and other forces is minimal. In shallower lakes, these nutrients circulate within the lake much more readily and the lake sediments can be a source of nutrients and turbidity that affect water quality. Additionally, East Twin Lake's direct watershed is small, so there is a small area from which polluted runoff might enter the lake. Aquatic vegetation is also healthy, but not so prolific as to be a nuisance, further contributing to high water quality. One exotic invasive plant is present in the lake, curly leaf pondweed, though its growth is moderate and restricted in extent due to lake depth.

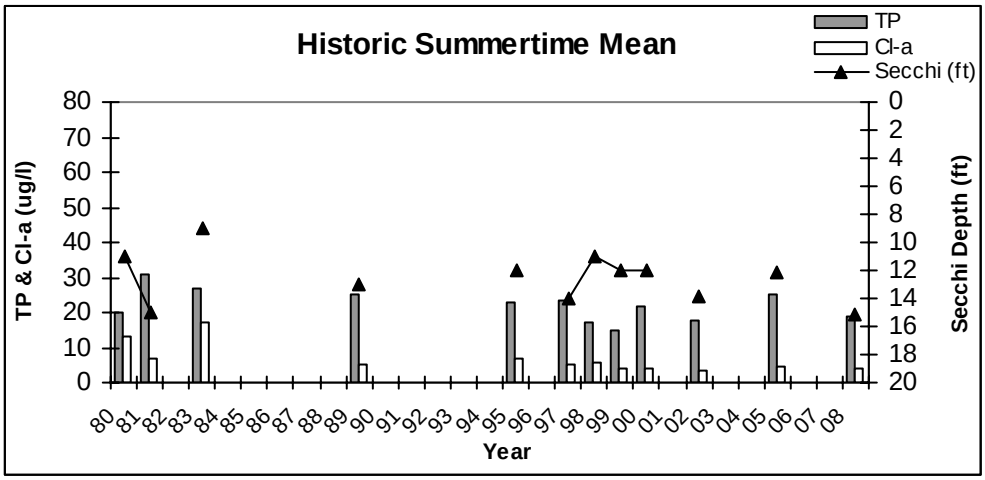
2008 East Twin Lake Water Quality Data

East Twin Lake 2008	Units	R.L.*	5/14/2008 Results	5/28/2008 Results	6/11/2008 Results	6/25/2008 Results	7/9/2008 Results	7/23/2008 Results	8/6/2008 Results	8/21/2008 Results	9/4/2008 Results	9/18/2008 Results	Average	Min	Max
pH		0.1	8.29	8.24	7.85	8.55	8.06	7.88	7.74	7.81	7.40	7.66	7.95	7.40	8.55
Conductivity	mS/cm	0.01	0.201	0.198	0.187	0.179	0.189	0.191	0.189	0.201	0.198	0.198	0.193	0.179	0.201
Turbidity	FNRU	1	2.00	1.00	1.00	2.00	1	2	1.00	2.00	1.00	1.00	1	1	2
D.O.	mg/l	0.01	11.23	9.10	8.36	9.31	7.38	7.88	8.05	7.82	6.93	8.85	8.45	6.93	11.23
D.O.	%	1	108%	94%	91%	112%	90%	96%	99%	95%	79%	95%	96%	79%	112%
Temp.	°C	0.1	13.5	17.0	19.2	24.9	25.0	25.4	25.7	25.3	21.2	18.6	21.6	13.5	25.7
Temp.	°F	0.1	56.3	62.6	66.6	76.8	77.0	77.7	78.3	77.5	70.2	65.5	70.8	56.3	78.3
Salinity	%	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl-a	mg/m^3	0.5	6.0	7.9	2	3.0	3.4	2.1	3.5	3.6	5.1	3.3	4.0	1.7	7.9
T.P.	mg/l	0.010	0.032	0.025	0.012	0.010	0.014	<0.02	0.021	0.021	0.018	0.021	0.019	0.010	0.032
T.P.	ug/l	10	32	25	12	10	14	<20	21	21	18	21	19	10	32
Secchi	ft	0.1	18.0	22.0	17.2	14.2	10.7	14.8	12.1	14.0	11.1	16.4	15.1	10.7	22.0
Secchi	m	0.1	5.49	6.71	5.24	4.33	3.26	4.51	3.69	4.27	3.38	5.00	4.6	3.3	6.7
Field Observations															
Physical			1	1	1	1	1	1	1	1	1	1	1	1	1
Recreational			1	1	1	1	1	1	1	1	1	1	1	1	1

*reporting limit

East Twin Lake Water Quality Results





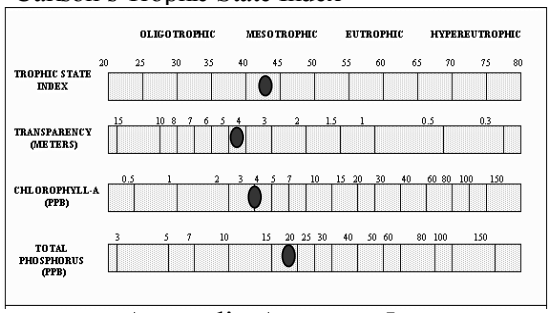
East Twin Lake Summertime Annual Mean

Agency	MC	MC	MC	MPCA	MC	ACD	MC	ACD	ACD	ACD	ACD	ACD
Year	1980	1981	1983	1989	1995	1997	1998	1999	2000	2002	2005	2008
TP	20.0	31.0	27.0	25.0	23.0	23.5	17.0	14.8	21.6	17.7	25.0	19.0
Cl-a	13.0	7.0	17.0	5.0	7.1	5.1	5.6	4.1	4.2	3.2	4.3	4.0
Secchi (m)	3.3	4.7	2.7	4.1	3.5	4.2	3.4	3.6	3.7	4.3	3.7	4.6
Secchi (ft)	11.0	15.0	9.0	13.0	12.0	14.0	11.0	12.0	12.0	13.9	12.2	15.1
Carlson's Tropic State Indices												
TSIP	47	54	52	51	49	50	45	43	48	45	51	47
TSIC	56	50	58	46	50	47	48	44	45	40	45	44
TSIS	43	38	46	40	42	39	42	42	41	40	41	38
TSI	49	47	52	46	47	45	45	43	45	42	46	43

East Twin Lake Water Quality Report Card

Year	80	81	83	89	95	97	98	99	2000	2002	2005	2008
TP	A	B	B	B	B	B	B	A	A	A	B	A
Cl-a	B	A	B	A	A	A	A	A	A	A	A	A
Secchi	A	A	B	A	A	A	A	A	A	A	A	A
Overall	**A**	**A**	**B**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**

Carlson's Trophic State Index



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 circumscribed 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. Two invasive exotic aquatic plants are established in this lake, Curly-leaf pondweed and Eurasian Water Milfoil.

2008 Results

In 2008 Lake George had excellent water quality for this region of the state (NCHF Ecoregion), receiving an overall A grade. In monitoring since 1980 the lake has gotten ten A letter grades and three B's. The lake is mesotrophic. Transparencies of 13 to 17 feet were found in spring. Conditions only slightly deteriorated throughout summer, when algal growth and sediment disturbance by boat traffic are likely causes of transparency decreases. Still, transparency was >7 ft throughout summer. Subjective observations by ACD staff were typically that "some algae" was present and there were minimal water quality issues that would affect swimming or boating.

Trend Analysis

Thirteen years of water quality data have been collected by the Metropolitan Council (between 1980 and '94, and 1998) and the Anoka Conservation District (1997, 1999, 2000, 2002, 2005, and 2008). Water quality has not significantly changed from 1980 to 2008 (repeated measures MANOVA with response variables TP, Cl-a, and Secchi depth, $F_{2,10}= 0.16$, $p>0.05$).

Discussion

Lake George remains one of the clearest of Anoka County Lakes. Lake George and nearby East Twin Lake are especially valuable resources because of their condition, size, suitability for many types of recreation, and ample public access. Both will be under continued or increasing stresses from recreational usage and/or development. Continued efforts are needed to maintain the lakes' quality including monitoring, education, and lakeshore and nutrient best management practices. One example is residential lakeshore restorations which have occurred on several properties. Because of the number of shoreland homes, failing septic systems may be a threat to the lake and a cooperative effort with the Lake George Conservation Club to conduct a shoreland septic survey is advised.

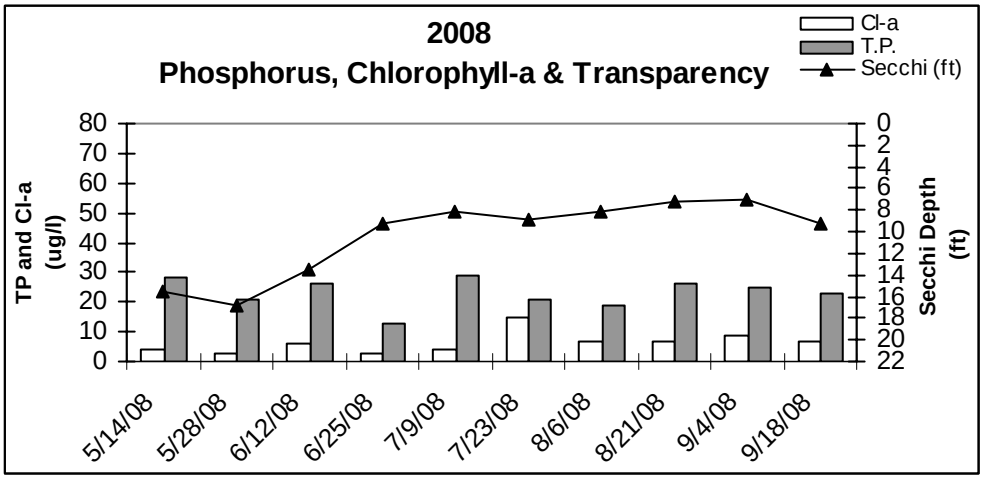
Two exotic invasive plants are present in Lake George. Curly leaf pondweed causes only a brief impairment in the spring but dies back by mid-June. Eurasian Water Milfoil is present, and in recent years has begun to affect recreation by matting to the surface in some localized areas. Control of Eurasian Water Milfoil has occurred in multiple years, orchestrated by the Lake George Conservation Club. In 2008 and 2009 there is a citizen-initiated effort underway to establish a Lake Improvement District which would tax lakeshore homeowners and have invasive species control as one of its primary purposes. Other aspects of the aquatic vegetation seem to be diverse and healthy, but not so prolific as to be a nuisance. In fact, a healthy native plant community may be serving to limit invasive species and certainly contributes to the lake's good water quality. Lakeshore homeowners should encourage native aquatic plants.

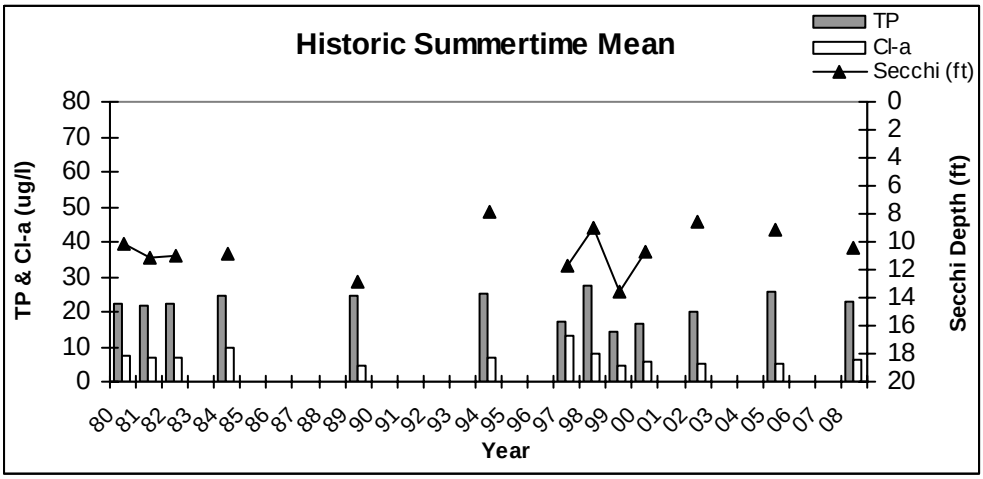
2008 Lake George Water Quality Data

Lake George 2008			5/14/2008	5/28/2008	6/12/2008	6/25/2008	7/9/2008	7/23/2008	8/6/2008	8/21/2008	9/4/2008	9/18/2008			
	Units	R.L.*	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Average	Min	Max
pH		0.1	8.15	8.32	7.93	8.73	8.72	8.73	8.52	8.52	7.86	8.27	8.38	7.86	8.73
Conductivity	mS/cm	0.01	0.195	0.191	0.178	0.174	0.179	0.176	0.173	0.181	0.180	0.180	0.181	0.173	0.195
Turbidity	FNRU	1	2.00	2.00	1.00	2.00	3.00	4.00	3.00	2.00	2.00	2.00	2	1	4
D.O.	mg/L	0.01	10.66	9.21	8.78	9.35	8.48	9.09	8.02	8.17	7.65	9.24	8.87	7.65	10.66
D.O.	%	1	100%	95%	94%	113%	102%	110%	98%	100%	87%	100%	100%	87%	113%
Temp.	°C	0.1	13.3	17.0	18.7	25.0	25.0	25.4	25.7	25.3	21.3	18.7	21.5	13.3	25.7
Temp.	°F	0.1	55.9	62.6	65.7	77.0	77.0	77.7	78.3	77.5	70.3	65.7	70.8	55.9	78.3
Salinity	%	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl-a	mg/L	0.5	4.3	2.4	5.8	2.7	4.3	15	7.0	7.0	9.0	7.0	6.4	2.4	14.8
T.P.	mg/L	0.010	0.028	0.021	0.026	0.013	0.029	0.021	0.019	0.026	0.025	0.023	0.023	0.013	0.029
T.P.	ug/L	10	28	21	26	13	29	21	19	26	25	23	23	13	29
Secchi	ft	0.1	15.6	16.8	13.5	9.3	8.2	8.8	8.2	7.2	7.1	9.3	10.4	7.1	16.8
Secchi	m	0.03	4.75	5.12	4.11	2.83	2.50	2.68	2.50	2.19	2.16	2.83	3.2	2.2	5.1
Field Observations															
Physical			1.0	1.5	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	3.0
Recreational			1.0	1.5	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	3.0

*reporting limit

Lake George Water Quality Results





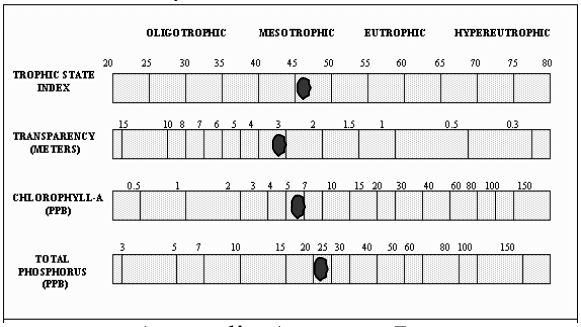
Lake George Summertime Annual Means

Agency	MC	MC	MC	MC	MC	MC	ACD	MC	ACD	ACD	ACD	ACD	ACD
Year	1980	1981	1982	1984	1989	1994	1997	1998	1999	2000	2002	2005	2008
TP	22.5	22.0	22.3	24.4	24.3	25.4	17.4	27.5	14.2	16.3	19.9	26.0	23.0
Cl-a	7.3	7.1	7.0	9.5	4.5	6.9	13.2	7.8	4.8	5.8	5.2	5.4	6.4
Secchi (m)	3.1	3.4	3.4	3.3	3.9	2.4	3.6	2.7	4.1	2.8	2.6	2.8	3.2
Secchi (ft)	10.2	11.2	11.0	10.8	12.9	7.8	11.7	9.0	13.5	10.7	8.6	9.1	10.4
Carlson's Tropic State Indices													
TSIP	49	49	49	50	50	51	45	52	42	44	47	51	49
TSIC	50	50	50	53	45	50	56	51	46	48	47	46	49
TSIS	44	42	43	43	40	48	42	45	40	45	46	46	43
TSI	48	47	47	49	45	49	48	49	43	46	47	47	47

Lake George Water Quality Report Card

Year	80	81	82	84	89	94	97	98	99	2000	2002	2005	2008
TP	A	A	A	B	B	B	A	B	A	A	A	B	B+
Cl-a	A	A	A	A	A	A	B	A	A	A	A	A	A
Secchi	A	A	A	A	A	B	A	B	A	B	B	B	A
Overall	**A**	**A**	**A**	**A**	**A**	**B**	**A**	**B**	**A**	**A**	**A**	**B**	**A**

Carlson's Trophic State Index



Stream Water Quality – Biological Monitoring

Description: This program combines environmental education and stream monitoring. Under the supervision of 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 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.

Locations: Rum River at Hwy 24, Rum River North County Park, St. Francis

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, as 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

% Dominant Family — High numbers indicates an uneven community, and likely poorer stream health.

Biomonitoring

RUM RIVER

at Hwy 24, Rum River North County Park, St. Francis

Last Monitored

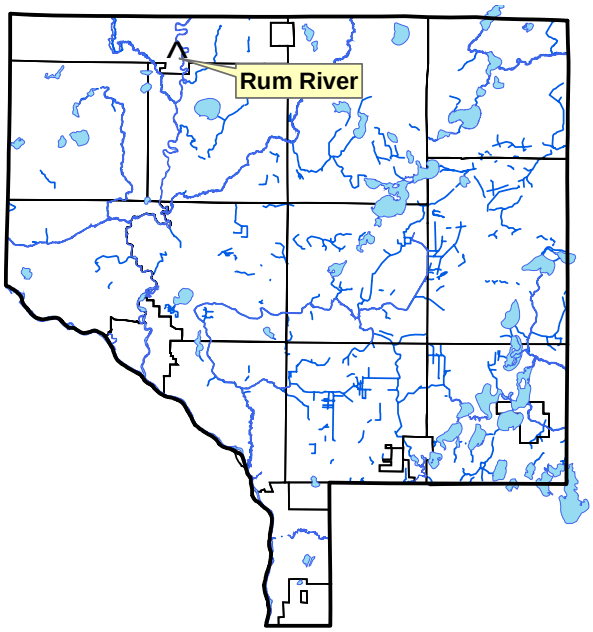
By St. Francis High School in 2008

Monitored Since

2000

Student Involvement

168 students in 2008, approx 868 since 2000



Background

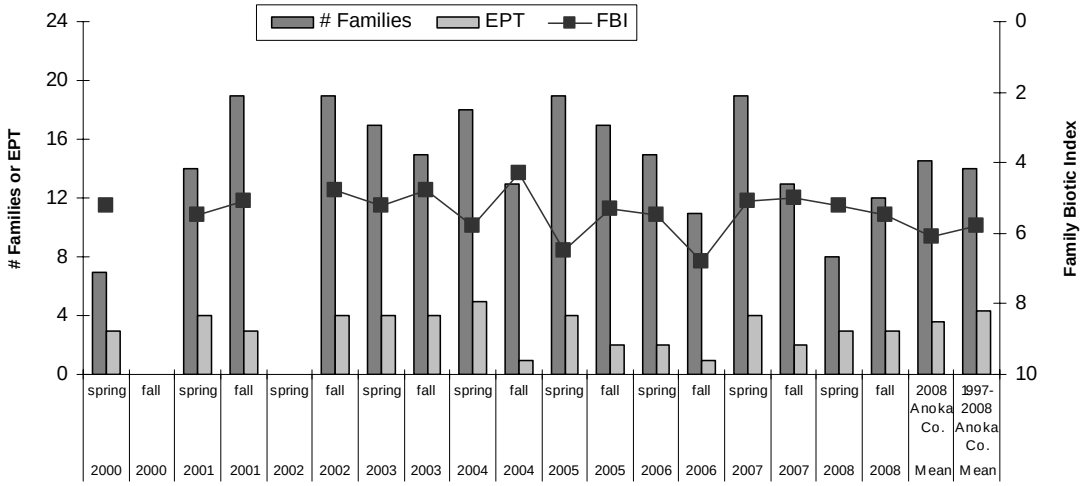
The Rum River originates from Lake Mille Lacs, and flows south through western Anoka County where it joins the Mississippi River in the City of Anoka. Other than the Mississippi, this is the largest river in the county. In Anoka County the river has both rocky ripples as well as pools and runs with sandy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

Results

St. Francis High School classes monitored the Rum River in both spring and fall 2008, with Anoka Conservation District oversight. Biological data for 2008, and historically, indicate the Rum River in northern Anoka County has the best conditions of all streams and rivers monitored throughout Anoka County. In 2008 the number of families and number of EPT families were substantially above the county averages. Thirty-five families were found in fall 2008; the next highest number of families ever found at 25 other Anoka County monitored streams is 24. One reason that so many families were found is that a large number of students (~112) helped with the sampling, finding 17 families that were in low abundance (< 5 individuals). The Family Biotic Index (FBI) in 2008 and other years was slightly lower than the average for Anoka County streams, due to high abundance of a few pollution-tolerant families; in 2008 corixidae accounted for 60% of all captures.

Summarized Biomonitoring Results for Rum River at Hwy 24, 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

Year	2000	2000	2001	2001	2002	2002	2002	2003	2003	2003	2003
Season	spring	fall	spring	fall	spring	spring	fall	spring	spring	fall	fall
FBI	4.16	3.70	not sampled	6.30	3.80	2.90	4.80	4.10	3.20	3.70	3.60
# Families	18	5		29	10	20	25	18	16	12	26
EPT	14	4		12	7	10	9	11	10	6	11
Date	5/24	?		23-Oct	3-Jun	29-May	8-Oct	30-May	29-May	10-Oct	1-Oct
sampling by	ACD	Xroads		SFHS	Xroads	SFHS	SFHS	Xroads	SFHS	Xroads	SFHS
sampling method	MH	MH		MH	MH	MH	MH	MH	MH	MH	MH
# individuals	125	233		152.5	164	112	133	132	104	278	102
# replicates	1	1		2	1	2	2	1	2	1	2
Dominant Family	heptageniidae	hydropyschidae		corixidae	hydropyschidae	perlodidae	hydropsychidae	hydropyschidae	hydropsychidae	baetidae	oligoneuridae
% Dominant Family	22	81.5		21	64	36.6	19.9	41.6	48.3	61.2	30.9
% Ephemeroptera	46.4	1.7		18	6.1	11.2	20.3	11.4	11	78.1	51
% Trichoptera	20.8	87.6		9.2	70.1	29	20.3	42.4	54.1	13.3	13.7
% Plecoptera	7.2	9.4		3.9	15.2	45.1	13.2	12.9	31.1	0.4	9.8

Year	2004	2004	2005	2005	2006	2006	2007	2007	2008	2008	Mean	Mean
Season	spring	fall	spring	fall	spring	fall	spring	fall	spring	fall	2008 Anoka Co.	1997-2008 Anoka Co.
FBI	3.60	6.80	4.00	6.40	4.30	7.70	5.00	8.30	6.40	6.50	6.1	5.8
# Families	22	22	18	24	20	22	19	22	21	35	14.4	14.0
EPT	16	9	10	11	9	7	10	6	11	14	3.5	4.3
Date	19-May	29-Sep	25-May	29-Sep	25-May	2-Oct	16-May	11-Oct	27-May	30-Sep		
sampling by	SFHS	SFHS	SFHS	SFHS	SFHS	SFHS	SFHS	SFHS	SFHS	SFHS		
sampling method	MH	MH	MH	MH	MH	MH	MH	MH	MH	MH		
# individuals	151	468	138	272	152	187	262	502	348	156		
# replicates	3	2	1	2	2	2	2	2	2	4		
Dominant Family	hydropsychidae	corixidae	perlodidae	gyrinidae	hydropsychidae	corixidae	hydropsychidae	corixidae	Corixidae	Corixidae		
% Dominant Family	40.5	38.2	29.7	22.4	35.3	66.3	42.7	58.8	57.5	61.4		
% Ephemeroptera	31.7	15.4	50	25	20.8	9.9	17.2	2	11.9	17.9		
% Trichoptera	48.9	1.5	11.6	5.9	35.3	4.8	44.3	1	5.9	6.9		
% Plecoptera	13.9	2.6	31.2	8.1	22.4	1.6	8	0.2	17.1	2.1		

Supplemental Stream Chemistry Readings

Parameter	5-29-03	5-19-03	9-29-04	9-29-05	5-25-06	10-2-06	5-16-07	10-11-07	5-27-08	9-30-08
pH	7.86	8.26	9.05	8.05	7.70	7.94	8.53	7.76	7.73	7.70
Conductivity (mS/cm)	0.274	0.163	0.168	0.194	0.265	0.351	0.278	0.242	0.284	0.341
Turbidity (NTU)	4	5	8	10	14	6	11	17	7	4
Dissolved Oxygen (mg/L)	na	na	9.13	8.86 (87%)	8.00 (86%)	10.87 (106%)	10.34 (106.4%)	9.66 (89%)	10.18 (101%)	7.83 (76%)
Salinity (%)	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.01
Temperature (C)	17.8	16.0	14.4	14.0	18.3	14.7	16.8	12.3	15.3	13.4

Discussion

Both chemical and biological monitoring indicate the good quality of this river. Habitat is ideal for a variety of stream life, and includes a variety of substrates, plenty of woody snags, riffles, and pools. Habitat deteriorates somewhat downstream near Anoka where the river is slower and the bottom is heavily sediment laden. Water chemistry monitoring done at various locations on the Rum River throughout Anoka County found that water quality also declines in the downstream reaches, though was still good. One cause of downstream deterioration is probably higher-density development and more intense land use. Overall, the condition of the river is regarded as very good throughout Anoka County.

Water resource management should be focused upon protecting the Rum's quality. Some steps to protect the Rum River could include:

- Enforce the building and clear cutting setbacks from the river required by state scenic river laws to avoid bank erosion problems.
- Use the best available technologies to reduce pollutants delivered to the river and its tributaries through the storm sewer system. This should include all of the watershed, not just those adjacent to the river.
- Survey the river by boat for bank erosion problems and initiate projects to correct them.
- Education programs to encourage actions by residents that will benefit the river's health.
- Continue water quality monitoring programs.

Stream Water Quality – WOMP Program

Description: The Watershed Outlet Monitoring Program (WOMP) is a Metropolitan Council stream and river monitoring program. In Anoka County, the program has an established monitoring station for the Rum River in Anoka, near its outlet to the Mississippi River. Water levels, flows, and 20+ water quality parameters are measured. Loading rates for important pollutants are estimated continuously and the Metropolitan Council provides in-depth analysis and reporting (not provided here). The Anoka Conservation District provides staffing for operations of the monitoring station.

Purpose: To understand water quality and hydrology throughout the twin cities metropolitan area.

Locations: Rum River at the Anoka Dam, City of Anoka

Results: Presented elsewhere by the Metropolitan Council. See http://www.metrocouncil.org/Environment/RiversLakes/

Rum River WOMP Monitoring Station

Wetland Hydrology

Description: Continuous groundwater level monitoring at a wetland boundary, to a depth of 40 inches. County-wide, the ACD maintains a network of 18 wetland hydrology monitoring stations.

Purpose: To provide understanding of wetland hydrology, including the impact 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 TechSystems property, St. Francis

Cedar Creek, Cedar Creek Natural History Area, East Bethel

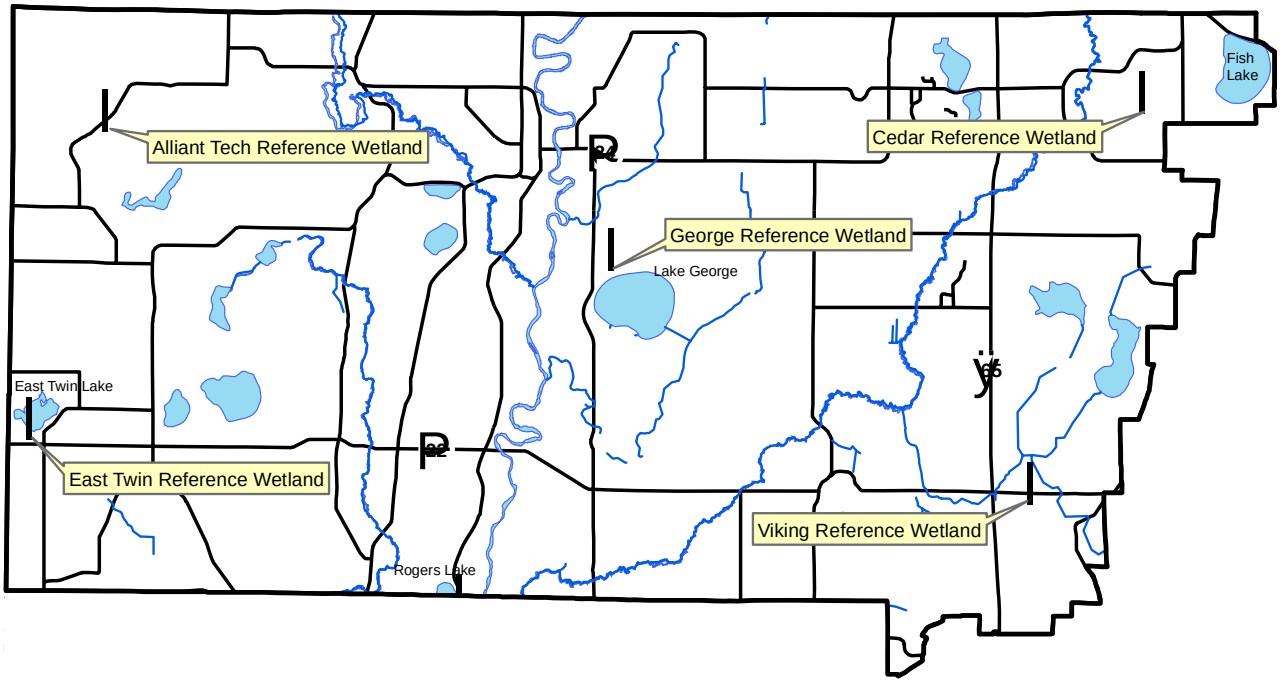
East Twin Reference Wetland, East Twin Township Park, Burns

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.

Wetland Hydrology Monitoring Sites

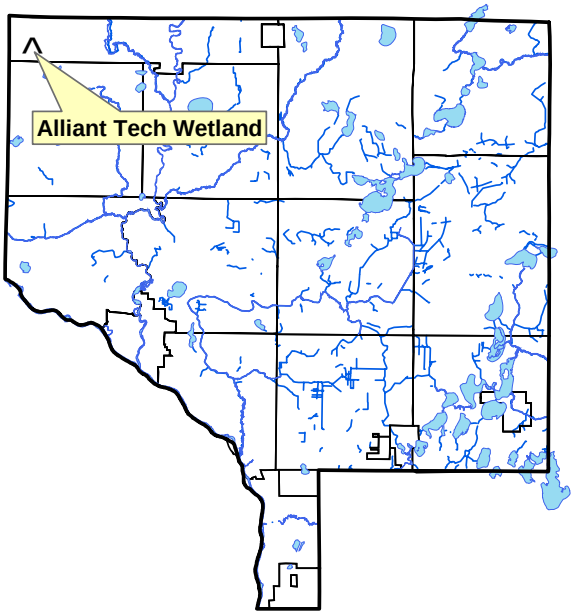


Wetland Hydrology Monitoring

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	-

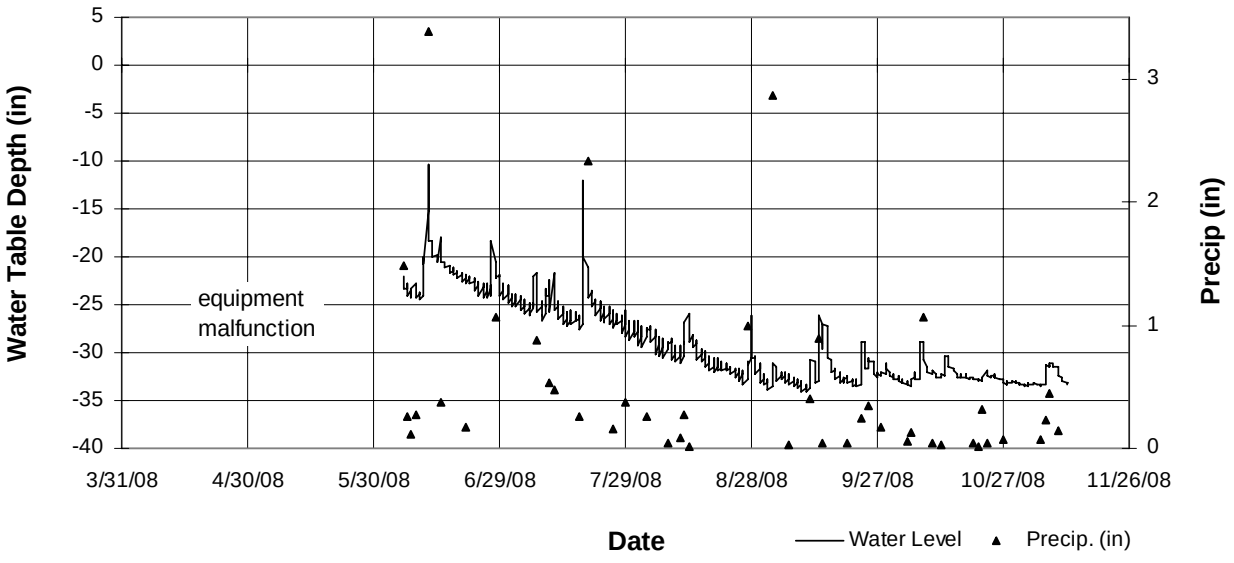
Surrounding Soils: Emmert

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.

2008 Hydrograph



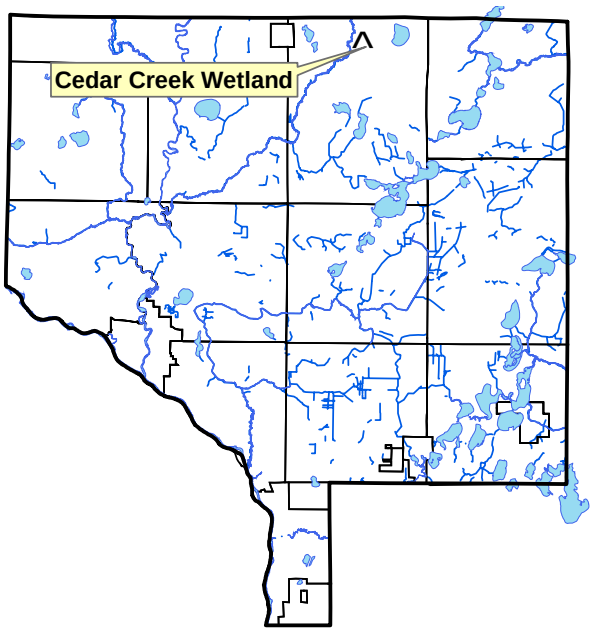
Well depths were 39 inches, so a reading of–39 indicates water levels were at an unknown depth greater than or equal to 39 inches.

Wetland Hydrology Monitoring

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

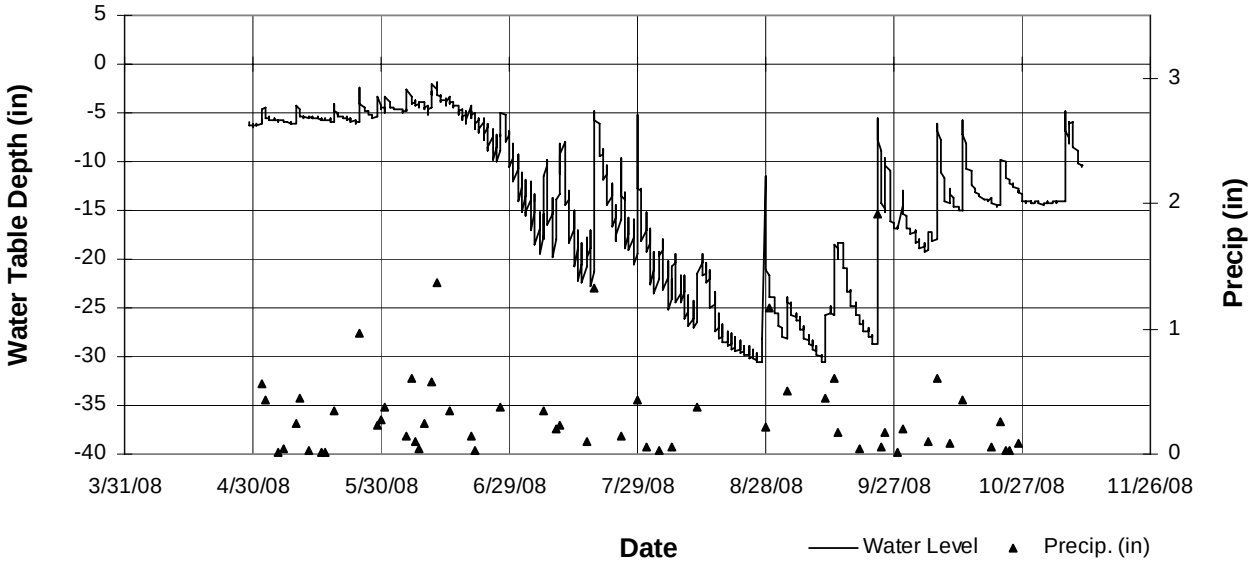
Soils at Well Location: not yet available

Surrounding Soils: Zimmerman

Vegetation at Well Location: not yet available

Other Notes: The Cedar Creek Natural History Area, 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.

2008 Hydrograph



Well depths were 39 inches, so a reading of–39 indicates water levels were at an unknown depth greater than or equal to 39 inches.

Wetland Hydrology Monitoring

EAST TWIN REFERENCE WETLAND

East Twin Lake Township Park, Burns Township

Site Information

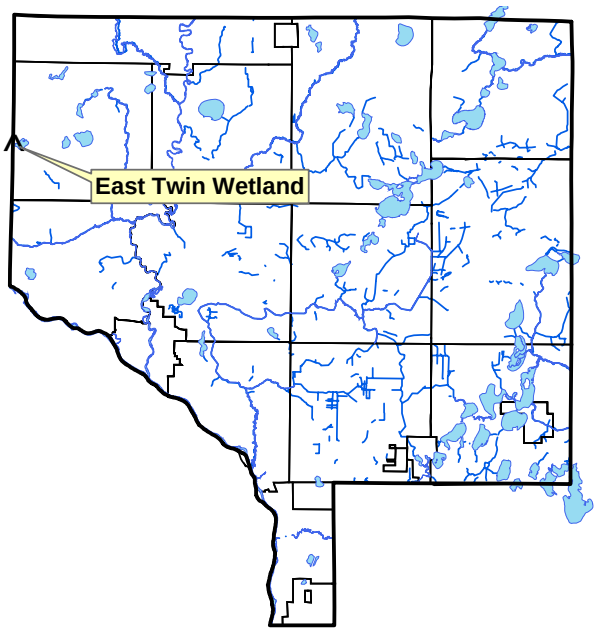
Monitored Since: 2001

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	-

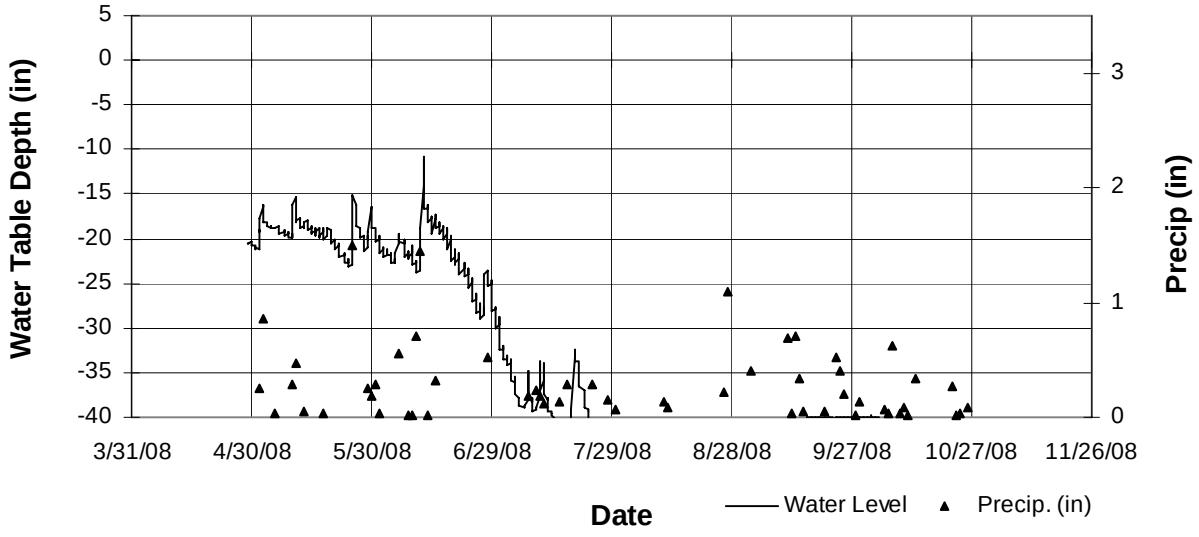
Surrounding Soils: Lake Beach, Growton and Heyder fine sandy loams

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 East Twin Lake County Park, and is only 180 feet from the lake itself. Water levels in the wetland are influenced by lake levels.

2008 Hydrograph



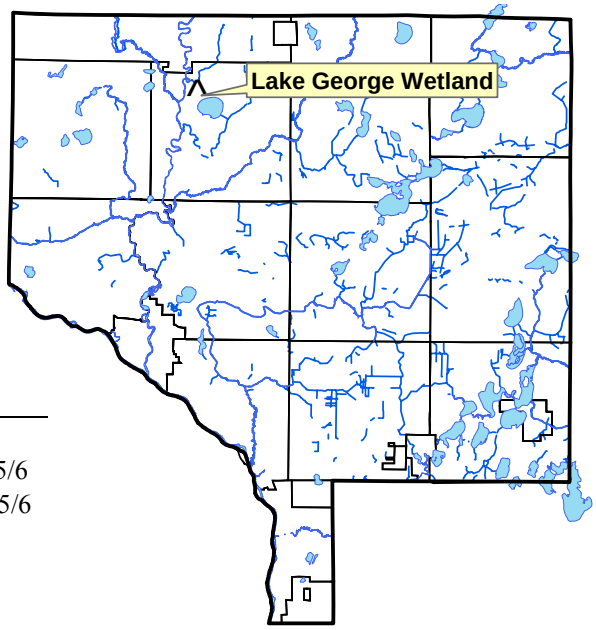
Well depths were 40 inches, so a reading of–40 indicates water levels were at an unknown depth greater than or equal to 40 inches.

Wetland Hydrology Monitoring

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

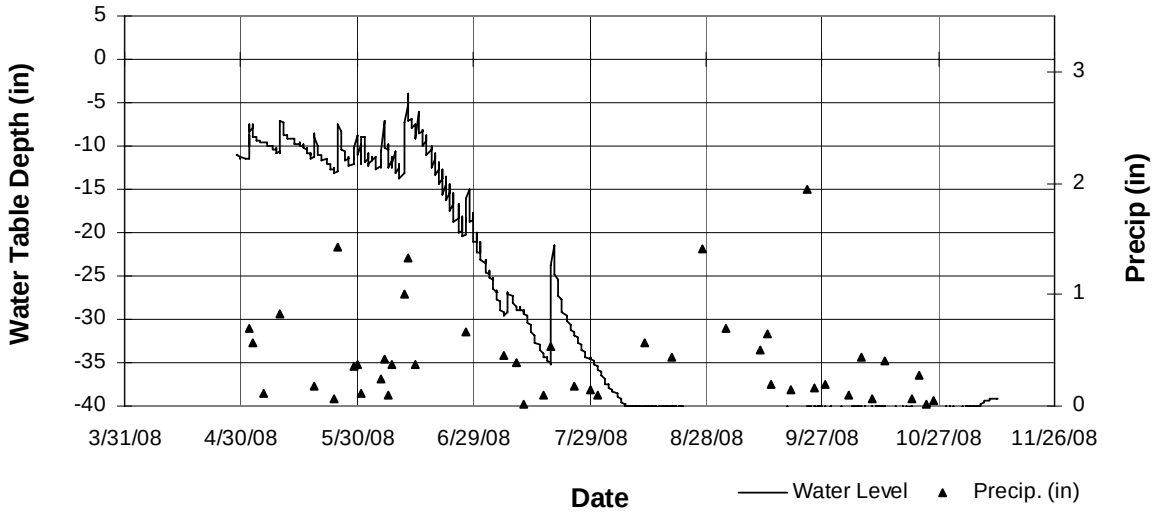
Surrounding Soils: Lino loamy fine sand and Zimmerman fine sand

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.

2008 Hydrograph



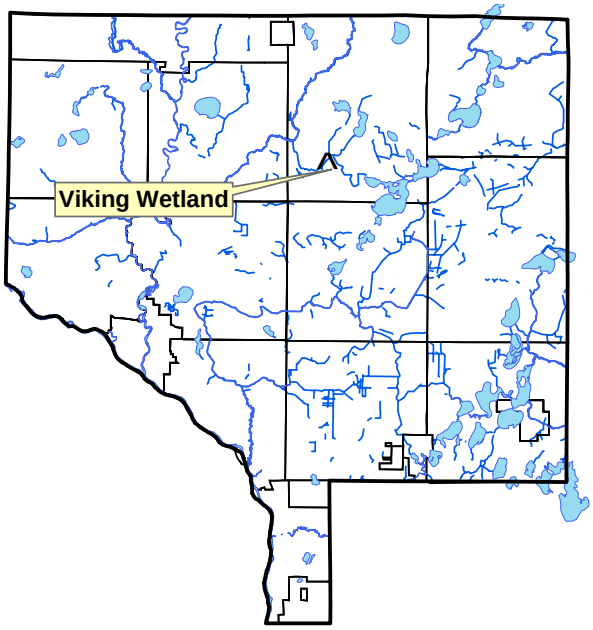
Well depths were 40 inches, so a reading of–40 indicates water levels were at an unknown depth greater than or equal to 40 inches.

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

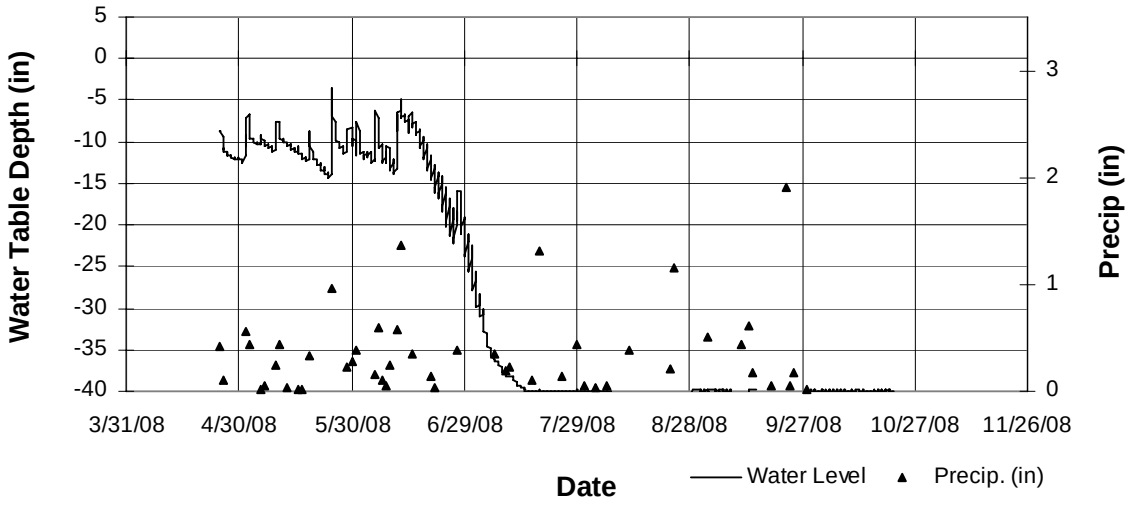
Surrounding Soils: Zimmerman fine sand

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).

2008 Hydrograph



Well depths were 40 inches, so a reading of –40 indicates water levels were at an unknown depth greater than or equal to 40 inches.

Water Quality Improvement Projects

Description: In 2006 the Upper River Watershed Management Organization (URRWMO) partnered with the Anoka Conservation District's Water Quality Cost Share Program. The URRWMO contributed $990 to be used as cost share grants for projects that improve water quality in lakes, streams, or rivers with the URRWMO area. Eligible projects included those that correct erosion, filter runoff to waterbodies, or restore native shoreline vegetation adjacent to a lake or stream. The funds may be used for up to 75% of the costs of materials and designing the project. Labor, aesthetic components of the project, and other costs, along with 25% of materials are the grant applicant's responsibility. The ACD's cost share grant policies apply and ACD administers the grant program.

The Anoka Conservation District (ACD) and Upper Rum River WMO have both undertaken efforts to promote these types of projects and the availability of cost share. Most recently, in 2007 the URRWMO did a customized mailing to 20 homeowners on East Twin and George Lakes who had been identified as having erosion problems or likely to develop problems. The ACD periodically does presentations to lake associations and other community groups, community newsletters, and website postings. In order to promote these types of projects the ACD also assists landowners throughout projects, including design, materials acquisition, installation, and maintenance.

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

Locations: Throughout the watershed.

Results: No projects have utilized the cost share funds, so they will remain available in subsequent years. The availability of these funds is an important component of recent and upcoming efforts to promote water quality improvement practices.

Cost Share Fund Balance:		
2006 URRWMO Contribution	+	$ 990
2006 Expenditures		$ 0
2007 URRWMO Contribution	+	$ 1,000
2007 Expenditures		$ 0
2008 Expenditures		$ 0
Fund Balance		**$ 1,990**

Homeowner Guide

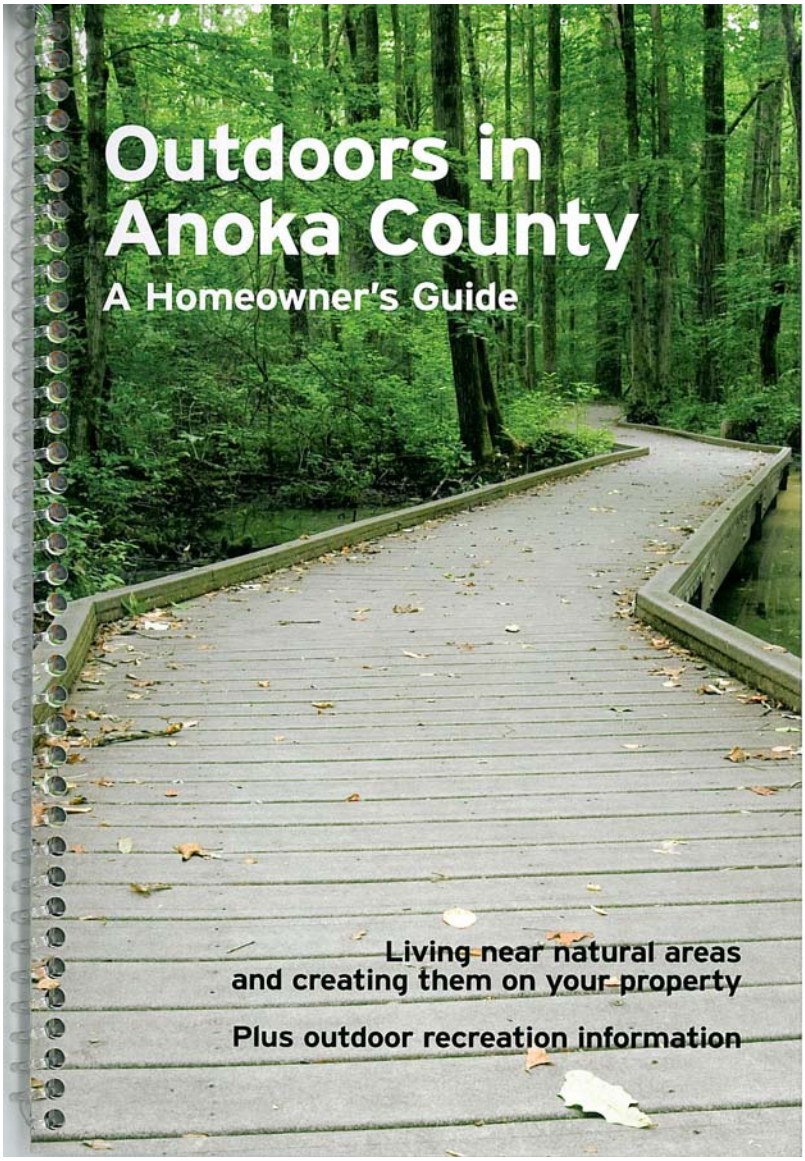
Description: The Anoka Conservation District (ACD) wrote, designed, and printed an educational booklet for homeowners. The booklet included information on topics of interest to the URRWMO, including landscaping for water quality, wetlands, well water, septic systems, and hazardous household wastes.

Purpose: To educate homeowners about topics that will impact local natural resources.

Locations: Throughout the watershed.

Results: "Outdoors in Anoka County – a homeowner's guide" was written, laid out by a graphic designer, and printed in 2007. The ACD distributed 1,212 booklets to homes near other important natural areas in the URRWMO area.

Homeowner's Guide Cover



URRWMO Website

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 Upper Rum River watershed. The website has been in operation since 2003.

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. The website serves as the URRWMO's alternative to a state-mandated newsletter.

Location: www.AnokaNaturalResources.com/URRWMO

Results: The URRWMO website contains information about both the URRWMO and about natural resources in the area.

Information about the URRWMO includes:

- a directory of board members,
- meeting minutes and agendas,
- descriptions of work that the organization is directing,
- highlighted projects.

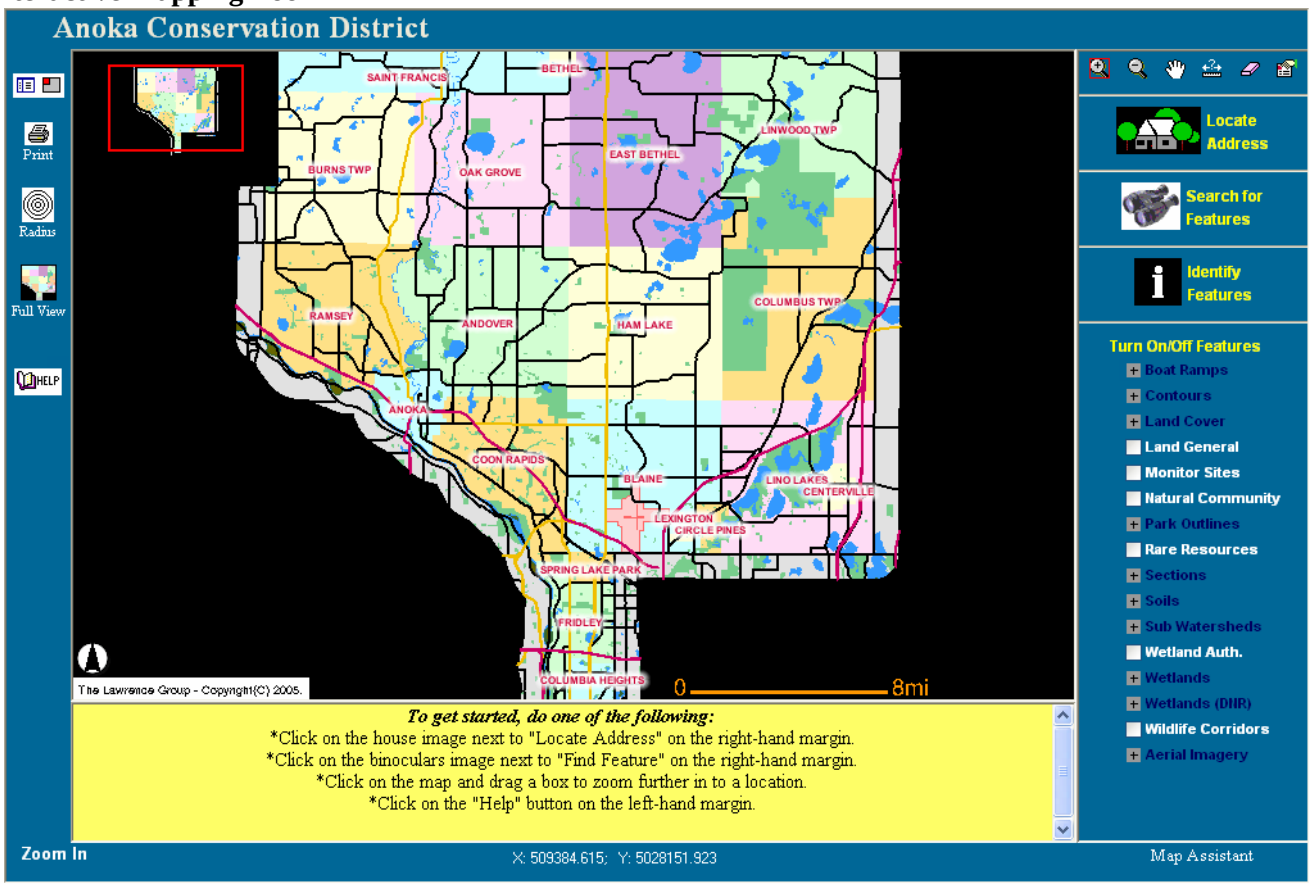
Other tools on the website include:

- an interactive mapping tool that shows natural features and aerial photos
- an interactive data download tool that allows users to access all water monitoring data that has been collected
- narrative discussions of what the monitoring data mean

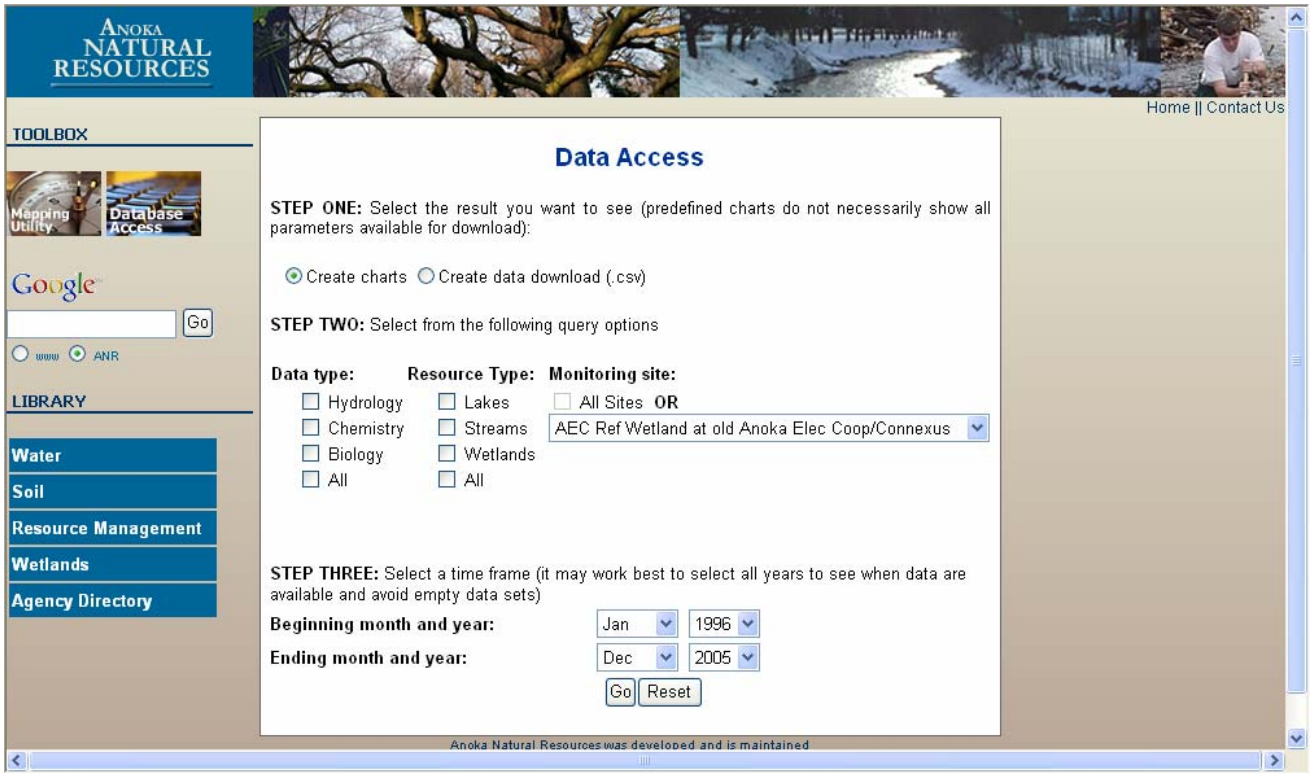
URRWMO Website Homepage

more on next page

Interactive Mapping Tool



Interactive Data Access Tool



Landcover Update

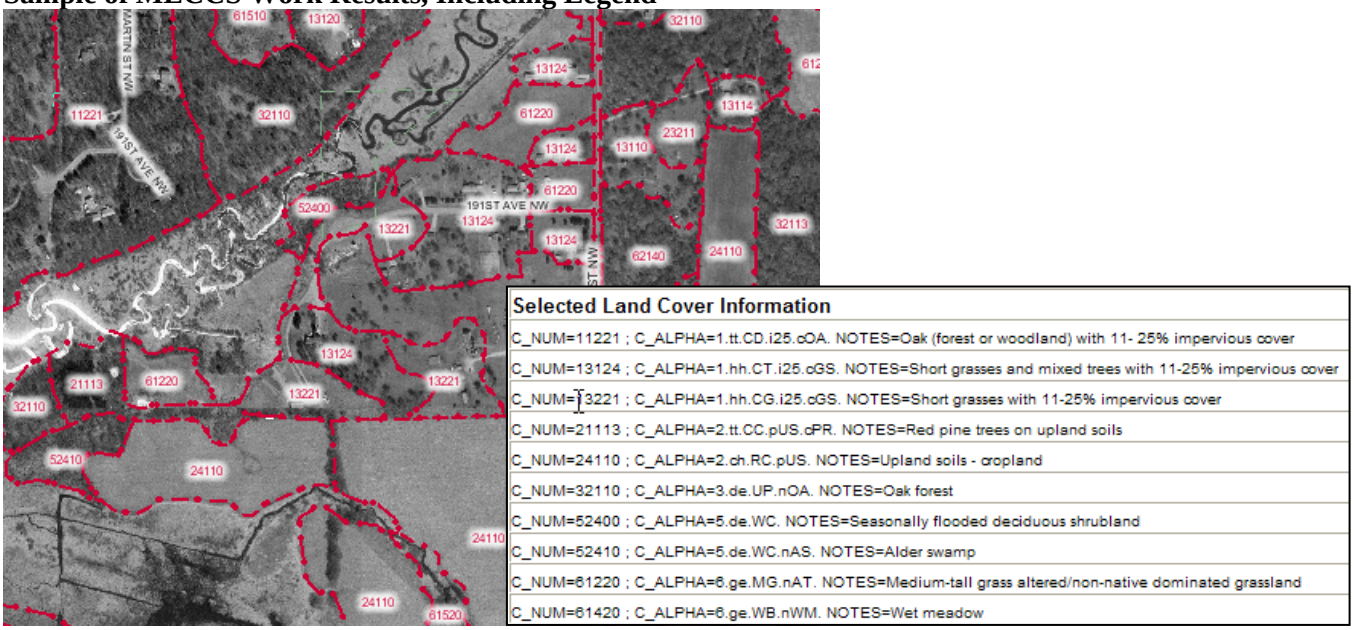
Description: The Minnesota Land Cover Classification System (MLCCS) is a Geographic Information System (GIS) map of land uses and land covers. It includes delineation and coding of any land use >2.5 acres (but often smaller), and follows Minnesota Department of Natural Resources methodologies. The maps are publicly-available tools for municipal and natural resource planners, and offer a high degree of detail.

Purpose: To update the MLCCS maps for a 21,000 acre area in north central Anoka County was done before current land mapping standards were implemented. This will result in a county-wide coverage consistent with current standards and methods. This provides municipal and natural resources planners with a detailed map of land uses including detailed accounts of natural communities found at any location.

Locations: North-central Anoka County.

Results: In 2008 MLCCS was updated for 21,000 acres in north-central Anoka County that were done in 1999 using less detailed methods. This work was accomplished using new aerial photos. Field verification is scheduled for 2009. The result is an updated county-wide coverage with a high degree of detail. A sample map is provided below.

Sample of MLCCS Work Results, Including Legend



URRWMO 2007 Annual Report to BWSR

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), the state agency with oversight authorities. 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).

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 2007 Upper Rum River WMO Annual Report. ACD provided copies of this report and a cover letter to the URRWMO Chair, Randy Bettinger, on March 26, 2008. This allowed one month for review and to request changes, though no such requests were made. The Chair submitted the report to BWSR.

Cover

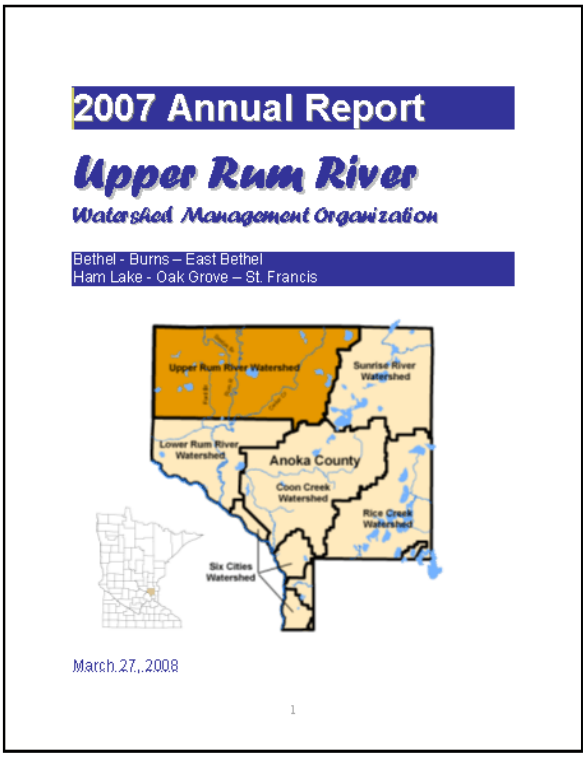
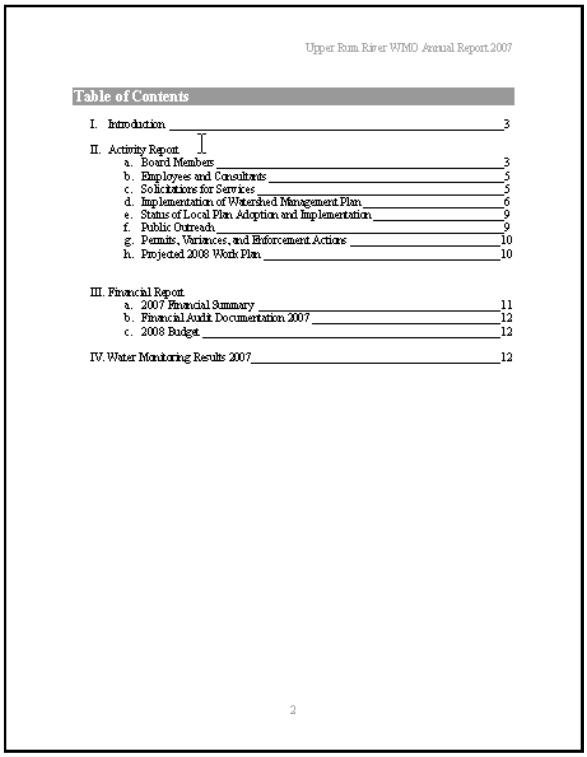


Table of Contents



Review of Municipal Local Water Plans

Description: The URRWMO Watershed Management Plan specifies:
"The URRWMO shall review local water management plans and evaluate their consistency with the Watershed Plan. All local water management plans shall be consistent with the URRWMO Watershed Management Plan. Member communities shall have two years from the date of the Board of Water and Soil Resource's approval of this Plan to adopt their local water management plans."

The URRWMO wishes to have these reviews of local water management plans conducted by staff with technical expertise in water resources, and has selected the Anoka Conservation District (ACD) to provide this service. The ACD agreed to:

- review local water management plans, as they are completed, and provide a summary of their consistency with the URRWMO Plan to the URRWMO Board, and
- orally presenting review findings at a URRWMO meeting.

The URRWMO makes final decisions about which comments are submitted to the city.
This work is being completed in both 2008 and 2009, but all fees were paid in 2008.

Purpose: To provide consistency across the watershed that will ensure the URRWMO's goals for water resources are met.

Locations: Watershed-wide

Results: Draft local water management plans were received from the cities of Bethel and Nowthen. The ACD reviewed each for consistency with the URRWMO Watershed Management Plan, and presented findings to the URRWMO Board.

URRWMO Watershed Management Plan Amendments

Description: The URRWMO's Watershed Management Plan, approved in 2007, did not include several components, and completion of these components was specified in the work plan for 2008. The components that the URRWMO Board wished to complete included water quality standards, a water quality monitoring plan, stormwater infiltration standards, and wetland standards.

Purpose: To provide consistency across the watershed that will ensure the URRWMO's goals for water resources are met.

Locations: Watershed-wide

Results: The URRWMO contracted the Anoka Conservation District (ACD) to assemble a technical advisory committee (TAC) including representatives from member municipalities, state review agencies, and the Builder's Association of the Twin Cities. This TAC created recommended standards for each of the four selected topics. These recommendations were reviewed by the URRWMO Board. The ACD facilitated the formal 60 and 45-day review periods for these proposed watershed plan amendments. Several minor edits followed. The final draft amendments were approved by the MN Board of Water and Soil Resources on January 8, 2009 and adopted by the URRWMO Board on February 3, 2009.

The entire URRWMO Watershed Management Plan and amendments are available at www.AnokaNaturalResources.com/URRWMO.

Recommendations

- **The Upper Rum River WMO should assist member cities with drafting and adopting local water plans and ordinances** that are consistent with the recently-updated URRWMO Watershed Management Plan and amendments to the Plan.
- **Investigate the condition of Ditch 19, the only inlet to Lake George**. Residents have complained that condition of the ditch and water control structures are contributing to low lake water levels in recent years. Anoka County is the legal ditch authority.
- **Promote water quality improvement projects** for lakes, streams, and rivers. Cost share grants are available through the URRWMO and ACD to encourage landowners to do projects that will have public benefits to water quality. Technical assistance for landowners is available through the Anoka Conservation District.
- **Diagnose and correct low dissolved oxygen problems in Crooked Brook**. This stream is on the state list of impaired waters.
- **Diagnose and improve Rogers Lake water quality problems** through a joint effort of the LRRWMO and URRWMO. First, monitoring in 2009 is recommended to better understand this unstable lake (see lake water quality discussion in Lower Rum River Watershed chapter of this report). In following years diagnostic work or active management of the lake may be needed.
- **Monitor water quality of Lake George and East Twin Lake every three years** to track any trends or changes. Next monitoring should be in 2011.
- **Monitor the Rum River at the top and bottom of the URRWMO area** to detect any water quality issues.