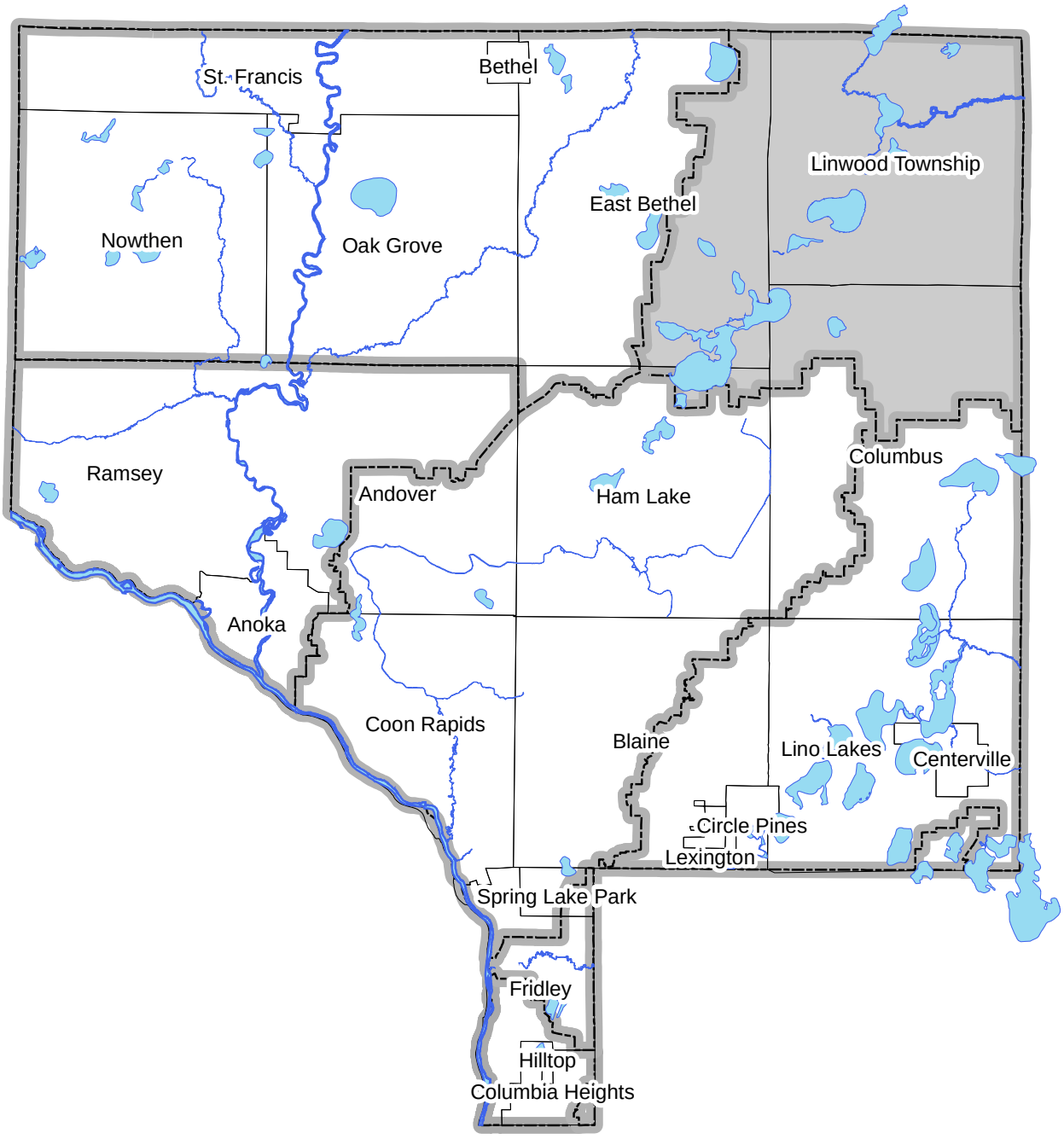
Excerpt from the
2013 Anoka Water Almanac

Chapter 2: Sunrise River Watershed



Prepared by the Anoka Conservation District

2013 WORK RESULTS:
SUNRISE RIVER WATERSHED

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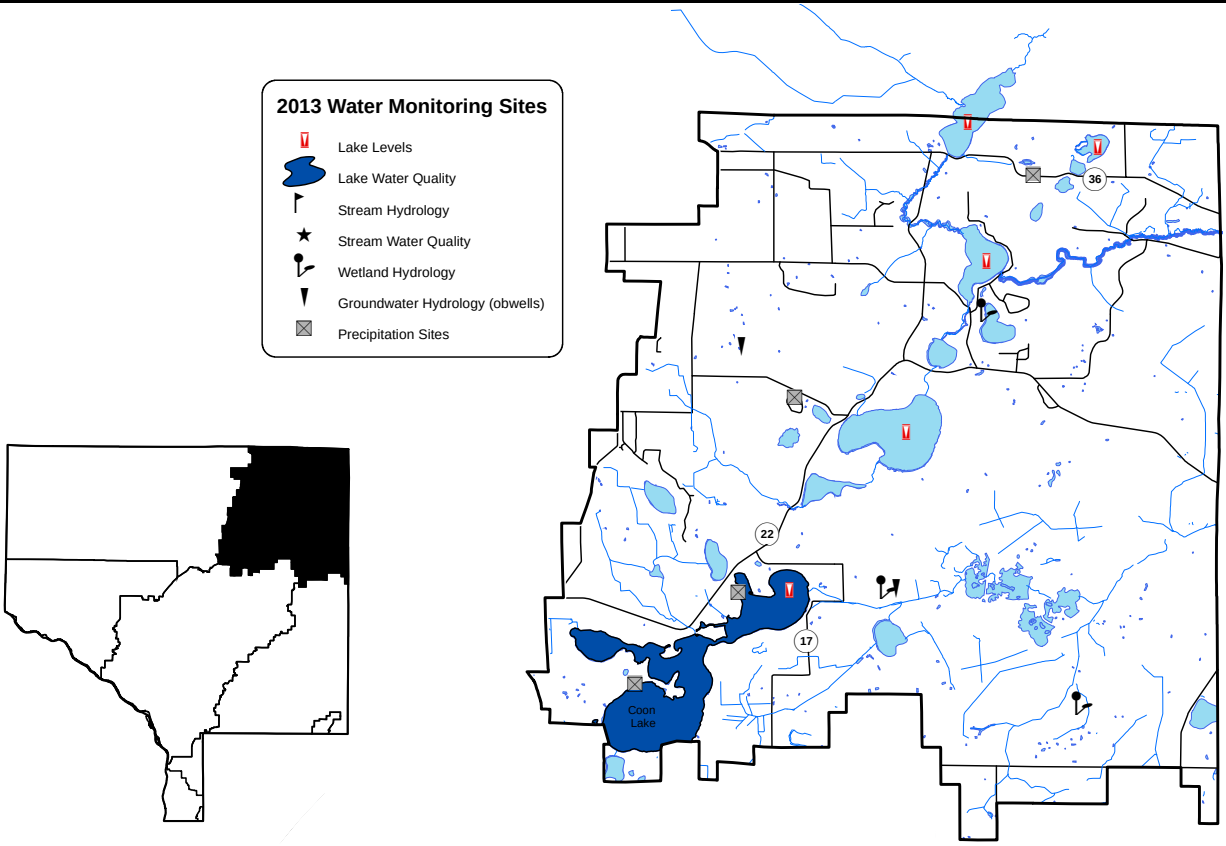
ACD = Anoka Conservation District, SRWMO = Sunrise River Watershed Management Organization,
MNDNR = Minnesota Dept. of Natural Resources, ACAP = Anoka County Ag Preserves



Lake Levels

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

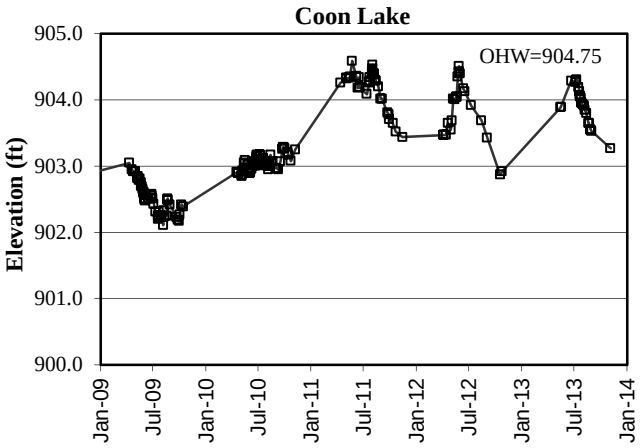
Purpose: To understand lake hydrology, including the impact of climate or other water budget changes. These data are useful for regulatory, building/development, and lake management decisions.

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

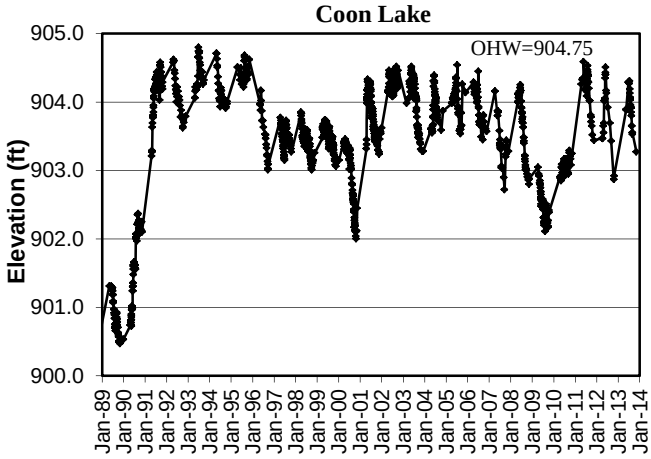
Results: Lake levels were measured by volunteers throughout the 2013 open water season. Lake gauges were installed and surveyed by the Anoka Conservation District and MN DNR. Lakes had sharply increasing water levels in spring and early summer 2013 when heavy rainfall totals occurred. Little rainfall fell later in the year and lake levels fell dramatically.

All lake level data can be downloaded from the MN DNR website's Lakefinder feature. Ordinary High Water Level (OHW), the elevation below which a DNR permit is needed to perform work, is listed for each lake on the corresponding graphs below.

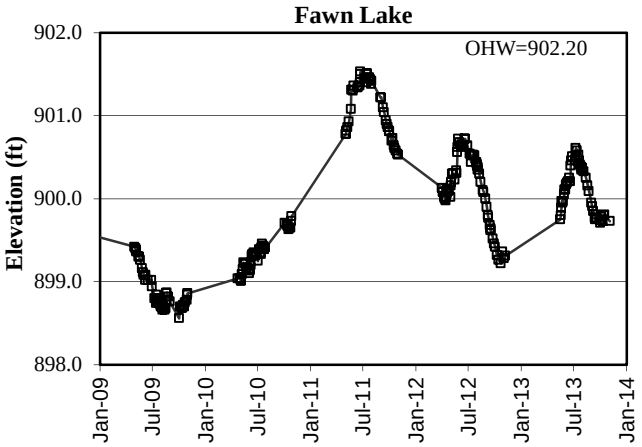
Coon Lake Levels – last 5 years



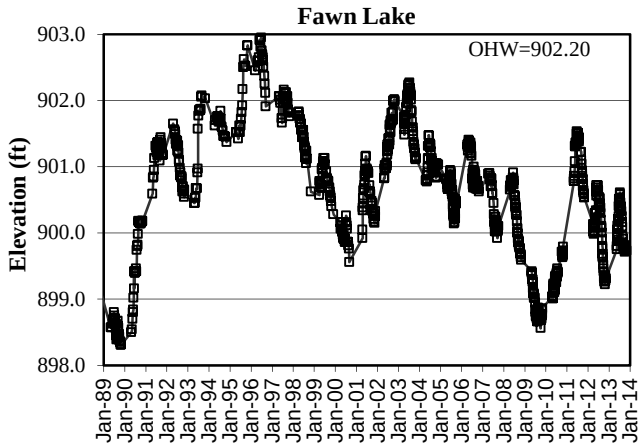
Coon Lake Levels – last 25 years



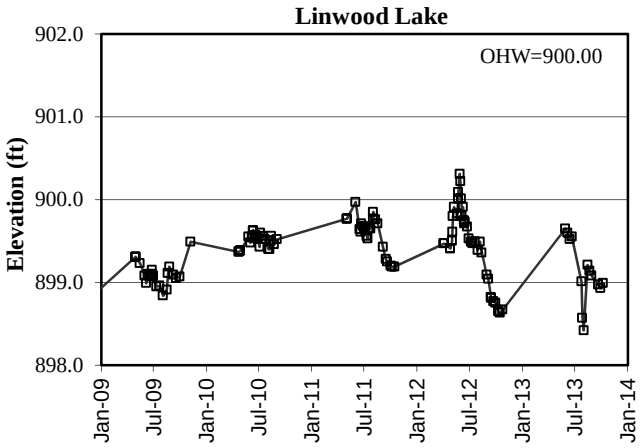
Fawn Lake Levels – last 5 years



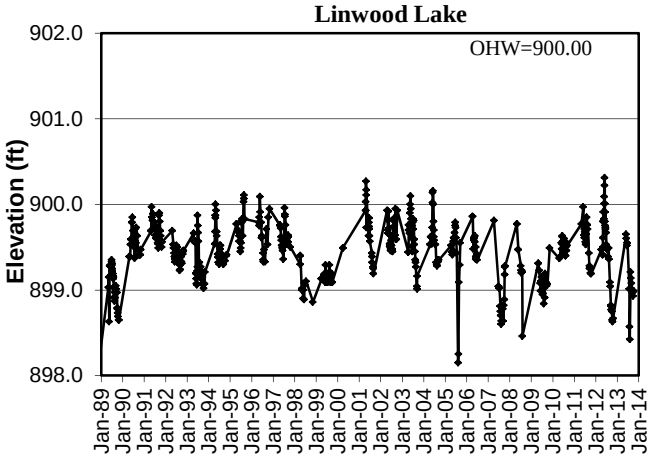
Fawn Lake Levels – last 25 years



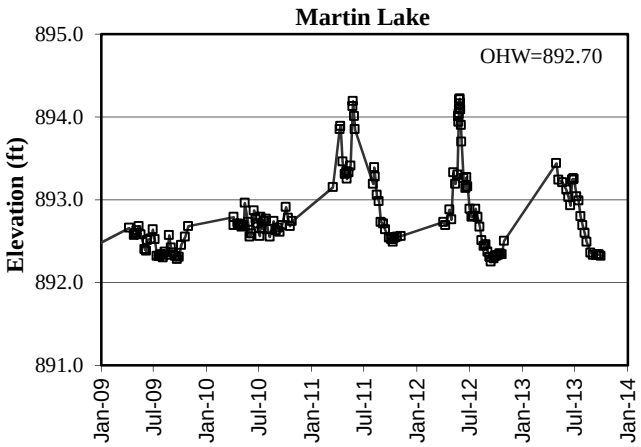
Linwood Lake Levels – last 5 years



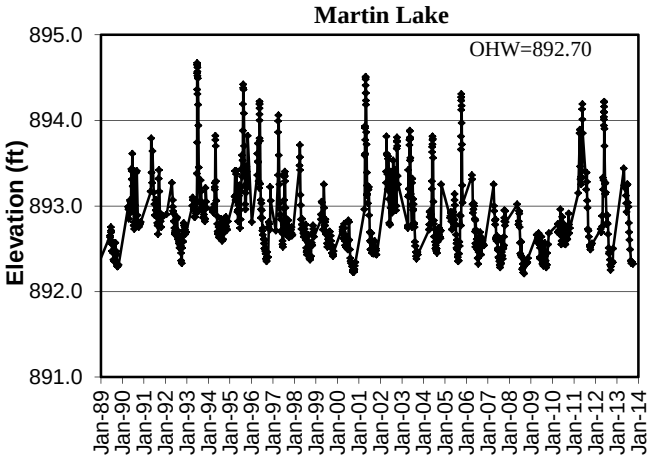
Linwood Lake Levels – last 25 years



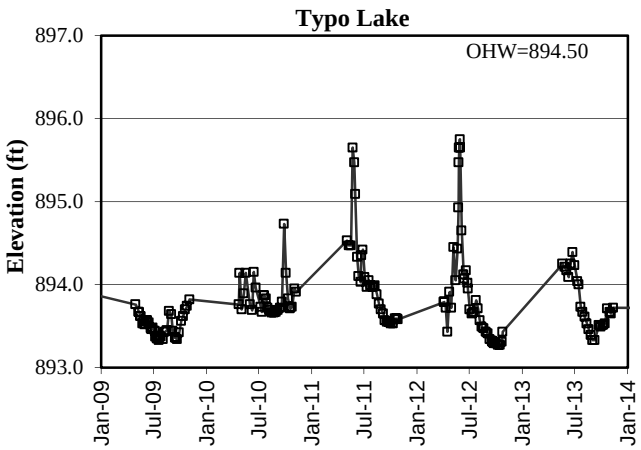
Martin Lake Levels – last 5 years



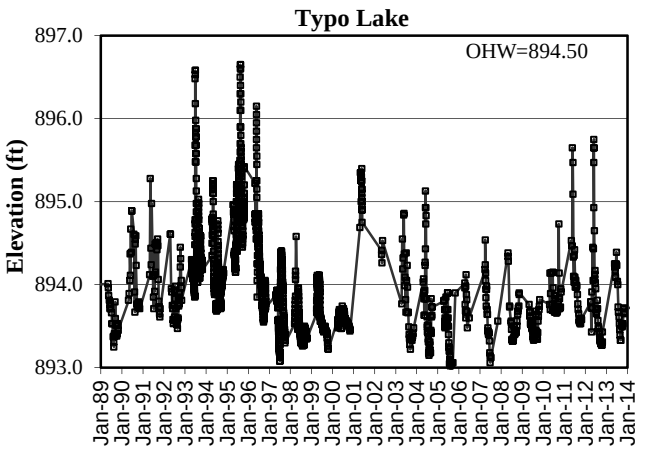
Martin Lake Levels – last 25 years



Typo Lake Levels – last 5 years



Typo Lake Levels – last 25 years



Lake Water Quality

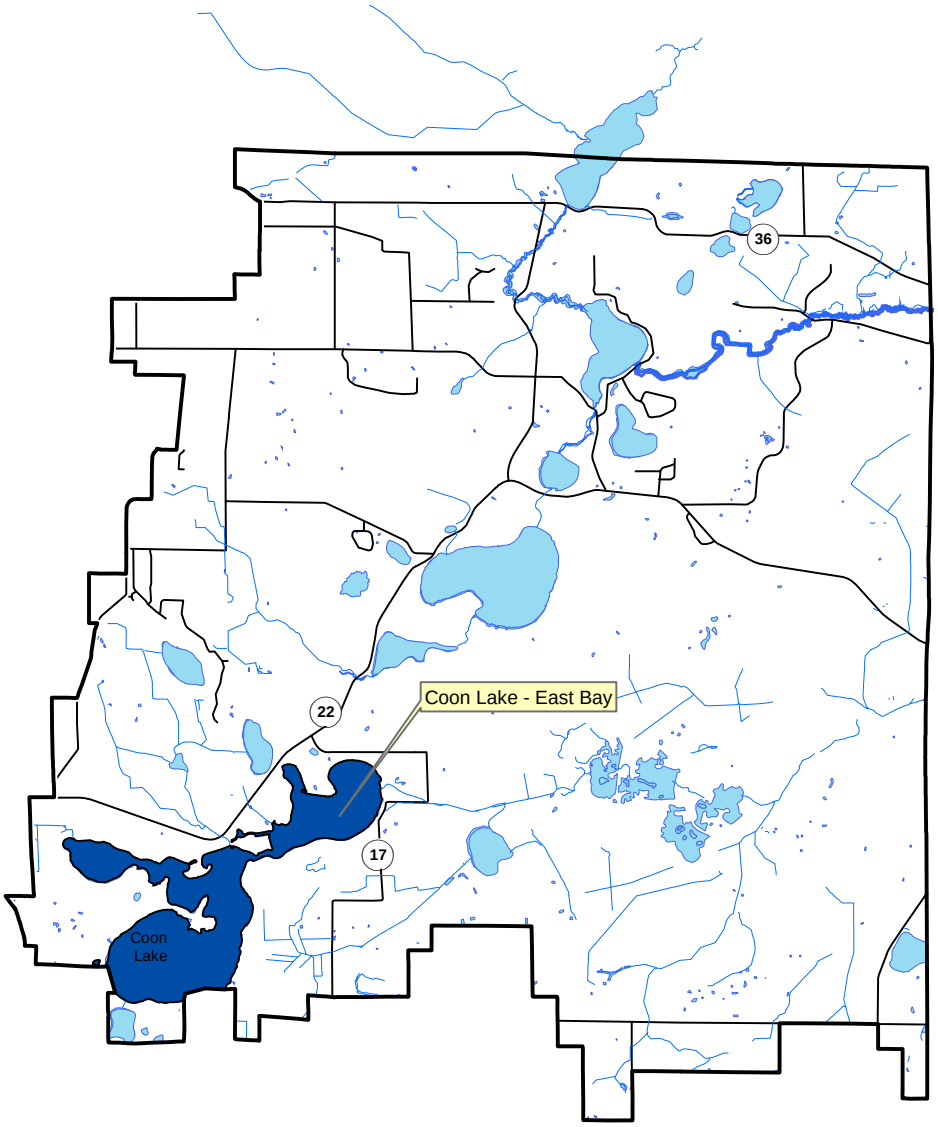
Description: May through September every-other-week monitoring of the following parameters: total phosphorus, chlorophyll-a, secchi transparency, dissolved oxygen, turbidity, temperature, conductivity, pH, and salinity.

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

Locations: Coon Lake East Bay

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

Sunrise Watershed Lake Water Quality Monitoring Sites



Coon Lake –East and West Bays

City of East Bethel, City of Ham Lake & City of Columbus, Lake ID # 02-0042

Background

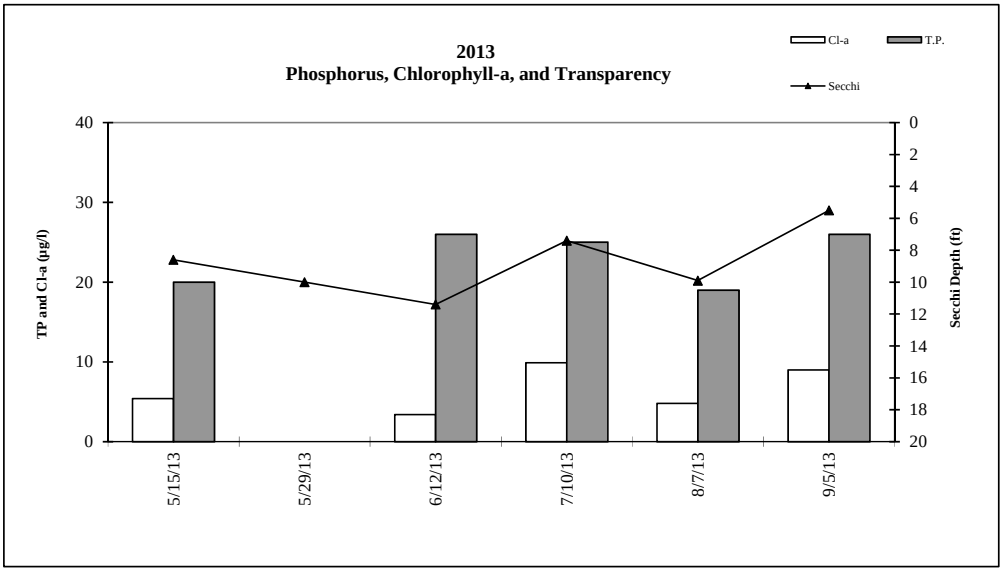
Coon Lake is located in east central Anoka County and is the county's largest lake. Coon Lake has a surface area of 1498 acres and a maximum depth of 27 feet (9 m). Public access is available at three locations with boat ramps, including one park with a swimming beach. The lake is used extensively by recreational boaters and fishers. Most of the lake is surrounded by private residences. The watershed of 6,616 acres is rural residential.

This report includes information for the East Bay (aka northeast or north bay) in 2013 and West Bay (aka southwest or south bay) of Coon Lake in 2012. The 2010-13 data is from the Anoka Conservation District (ACD) monitoring at the MN Pollution Control Agency (MPCA) monitoring site #203 for the East Bay and #206 for the West Bay. Over the years, other sites have been monitored and are included in this report's trend analysis when appropriate. When making comparisons between the two bays, please consider that both bays were monitored simultaneously only in 2010 and 2012; data from other years do not lend themselves well to direct comparisons because monitoring regimes were likely different.

2013 Results – East Bay

In 2013 the East Bay was monitored every 4 weeks. The water quality is slightly better than average for this region of the state (NCHF Ecoregion), receiving a B+ grade. Average values of important water quality parameters included 23.2 µg/L for total phosphorus, 6.5 µg/L chlorophyll-a, and Secchi transparency of 8.8 feet. Chlorophyll-a levels were the lowest of all monitored years. Phosphorus levels were the second lowest of all monitored years and have seen a drop in each of the last 4 years. Similarly, transparency results were the deepest in all monitored years and have shown improvement in each of the last 5 monitoring years. The subjective observations of the lake's physical characteristics and recreational suitability by the ACD staff indicated that lake conditions were excellent for swimming and boating.

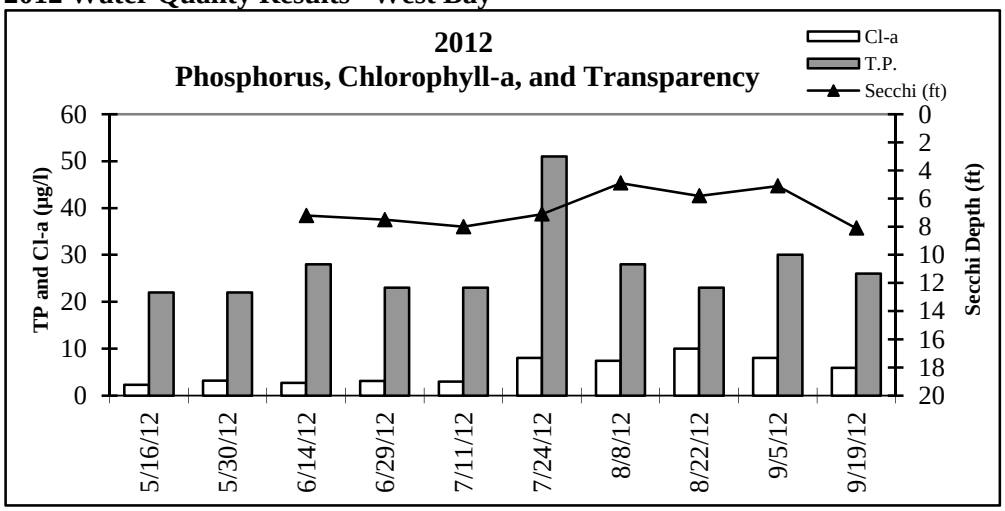
2013 Water Quality Results – East Bay



2012 Results – West Bay

In 2012 the West Bay had slightly better than average water quality for this region of the state (NCHF Ecoregion), receiving an A- letter grade. West Bay total phosphorus averaged 28.0 µg/L and chlorophyll-a averaged 5.4 µg/L. Secchi transparency could not be measured on two occasions because it exceeded basin's depth.

2012 Water Quality Results –West Bay



Comparison of the Bays

The East and West Bays of Coon Lake often have noticeably different water quality. In 2010, on every date water quality was better in the West Bay than East, with an average difference of 13 µg/L phosphorus and 5.4 µg/L chlorophyll-a (algae). In 2012, water quality in the two bays was more similar. Neither bay had consistently lower phosphorus and the average phosphorus reading differed by only 2 µg/L. Chlorophyll-a readings were more frequently lower in the West bay but the average reading only differed by 2.8 µg/L. A direct comparison of average Secchi transparency was not possible in 2010 or 2012 because transparency exceeded the lake depth on multiple occasions in the West Bay and a reading could not be obtained.

Trend Analysis

To analyze Coon Lake trends we obtained historic monitoring data from the MPCA. Over the years water quality has been monitored at 17 sites on the lake. For the trend analysis, we pooled data from five East Bay sites (#102, 203, 208, 209, and 401) and four West Bay sites (#101, 105, 206, and 207). These sites were chosen because they were all in the bay of interest, close to each other, and distant from the shoreline. The trend analysis is based on average annual water quality data for each year with data. We used data only from years with data from every month from May to September, except we allowed one month of missing data. Only data from May to September were used. Starting in 1998 only data from ACD was used for greater comparability.

East Bay Trend Analysis

In the East Bay twenty one years of water quality data have been collected since 1978. During the most recent 13 years that were monitored (since 1996), the data collected included total phosphorus, chlorophyll-a, and Secchi transparency. For most of the other eight years (all pre-1997) only Secchi transparency data is available. This provides an adequate dataset for a trend analysis, however given that most of the data is from the last 21 years, the analysis is not strong at detecting changes that occurred prior to 1990.

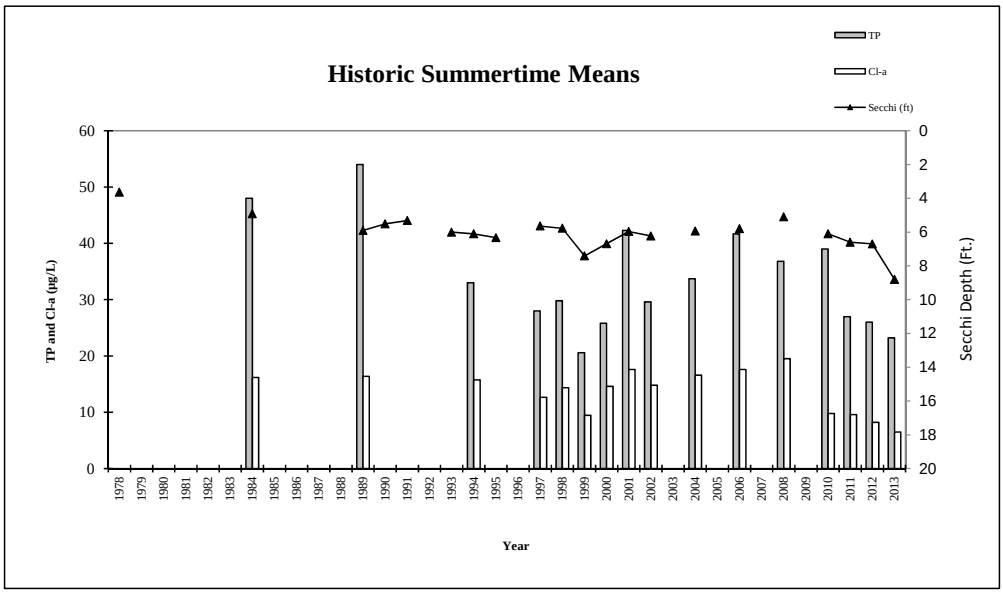
No water quality trend exists when we examined those years with total phosphorus, chlorophyll-a, and Secchi transparency, excluding the years with only Secchi transparency data. The analysis was a repeated measures

MANOVA with response variables TP, Cl-a, and Secchi depth ($F_{2,13}$=2.8, p=0.10). This is our preferred approach because it examines all three parameters simultaneously.

We also examined Secchi transparencies alone across all 18 years using a one-way ANOVA. Including all years, a significant trend of improving transparency is found ($F_{1,19}$=15.88, p=0.0008). This result appears influenced by the low transparency in 1978. Though, if we exclude 1978 and re-run the analysis we find the trend is still present and statistically significant (p=0.012), p values of 0.05 or less indicate statistical significance at the 95% confidence level). In summary, it appears that improvements in transparency have been occuring.

It is noteworthy that a water quality improvement seems to have occurred over the last few years (see graph below). The reason for such a change, if real, is unknown.

Historic Water Quality - East Bay

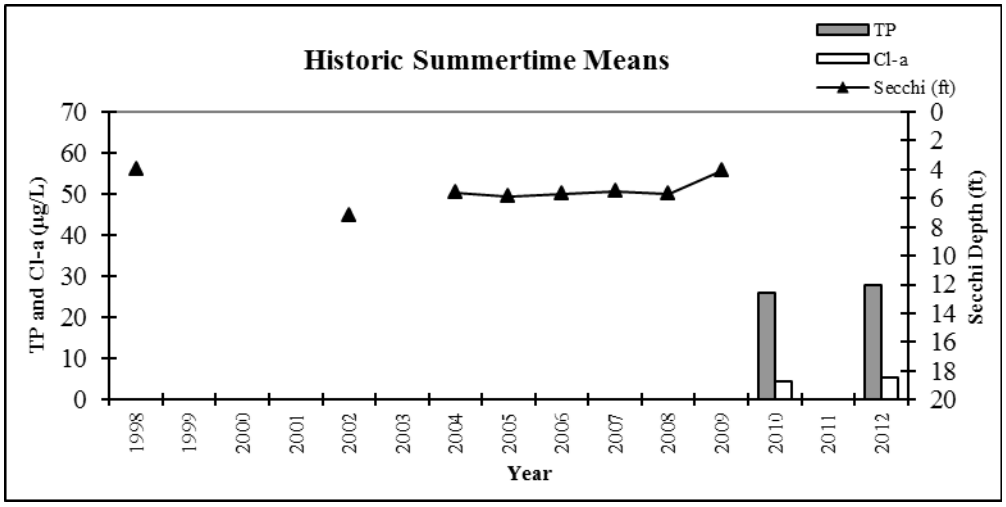


West Bay Trend Analysis

Ten years of data are available for the West Bay including only two years with phosphorus and chlorophyll-a data, so a powerful trend analysis is not possible. The dataset for Secchi transparency is longer, but data from 2010 and 2012 must be excluded because a full suite of Secchi measurements is not available due to clarity exceeding the lake depth occasionally. Therefore, a statistical analysis would not be highly meaningful. Instead, we'll use a non-analytical look at the data.

In 2012 the average secchi was 6.7 feet (excludes two measurements of >10feet). In 2010 the average secchi was 7.2 feet (excludes three measurements of >10feet). For eight monitored years in 1998-2009, seven of those years had average secchi of <6 feet. One year was 7.18 feet. It's notable that in the two most recent years the average secchi transparency was greater than in all but one of previous years. It suggests that if anything, transparency is mildly improving.

Historic Water Quality - West Bay



Discussion

While Coon Lake is not listed as "impaired" by the MN Pollution Control Agency, the East Bay has been close to the state water quality standard of 40 µg/L of phosphorus or greater in the recent past. In 2006 phosphorus averaged 42 µg/L, was 37 µg/L in 2008, and in 2010 was 39 µg/L. However, 2011 was the beginning of a 3 year consecutive decline in phosphorous levels. Phosphorous levels dropped to 27 µg/L in 2011, again to 26 µg/L in 2012, and hitting a 14 year low of 23.2 µg/L in 2013 (second lowest on record). While recent results appear to be trending in the right direction, continued efforts to improve water quality are strongly encouraged to prevent the lake from becoming designated as "impaired." Such a designation would trigger an in-depth study under the Federal Clean Water Act.

Given the highly-developed nature of the lakeshore, the practices of lakeshore homeowners are a reasonable place to begin water quality improvement efforts. Residents should increase the use of shoreline practices that improve water quality and lake health, such as native vegetation buffers and rain gardens. Clearing of native vegetation to create a "cleaner" lakefront should be avoided because this vegetation is important to lake health and water quality. Septic system maintenance and replacement where necessary, should be a priority on an individual home basis and on a community level. This might be most beneficial in the Hiawatha Beach, Interlachen, and Coon Lake Beach neighborhoods, where the greatest frequency of septic system failures is suspected.

A final challenge for Coon Lake is the aquatic invasive species Eurasian water milfoil (EWM) and Curly Leaf Pondweed (CLP). EWM was discovered in the lake in 2003 and spread rapidly. In 2008 a Coon Lake Improvement District (CLID) was formed, with EWM management as a core of its function. EWM is actively monitored and treated with herbicide in accordance with DNR rules and a lake vegetation management plan. CLP has been present longer. CLID started treatment of CLP in 2009. In 2010 the East Bay was accepted into a five year pilot program for treatment of CLP. There is not yet enough data to say definitively, but it is possible that early season treatment of CLP could be a contributing factor in the recent decline in phosphorous levels. CLP takes up phosphorous from the soil through its root system and dies off early summer causing a spike in phosphorous. Early treatment may be shortening the time the CLP has to uptake phosphorous from the soil as well as reducing overall regrowth due to treatments occurring prior to CLP sprouting turions (a shoot vital to reproduction).

2013 Coon Lake East Bay Water Quality Data

Coon Lake East Bay
2013 Water Quality Data

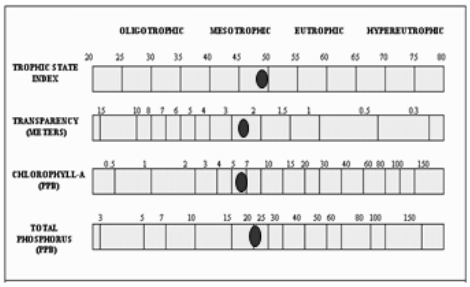
	Units	R.L.*	5/15/2013 Results	5/29/2013 Results	6/12/2013 Results	7/10/2013 Results	8/7/2013 Results	9/5/2013 Results	Average	Min	Max
pH		0.1	8.22	8.57	8.38	8.69	8.96	8.84	8.61	8.22	8.96
Conductivity	mS/cm	0.01	0.145	0.189	0.186	0.175	0.17	0.202	0.178	0.145	0.202
Turbidity	FNRU	1	2	0.8	1.7	2.1	2.9	6.8	3	1	7
D.O.	mg/L	0.01	11.84	10.51	9.05	8.05	8.2	8.42	9.35	8.05	11.84
D.O.	%	1	112%		97%	102%	98%	102%	102%	97%	112%
Temp.	°C	0.1	13	16	19	25	23	23	20.0	13.1	25.4
Temp.	°F	0.1	55.6	60.5	66.2	77.8	73.9	74.1	68.0	55.6	77.8
Salinity	%	0.01	0	0.09	0.09	0.09	0.08	0.1	0.08	0.00	0.10
Cl-a	ug/L	0.5	5.4		3.4	9.9	4.8	9	6.5	3.4	9.9
T.P.	mg/L	0.010	0.02		0.026	0.025	0.019	0.026	0.023	0.019	0.026
T.P.	ug/L	10	20		26	25	19	26	23.2	19.0	26.0
Secchi	ft	0.1	8.6	10	11.4	7.4	9.9	5.5	8.8	5.5	11.4
Secchi	m	0.1	2.62	3.05	3.47	2.26	3.02	1.68	2.7	1.7	3.5
Physical			1.0	1.0	2.0	1.0	2.0	2.0	1.5	1.0	2.0
Recreational			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

*reporting limit

Coon Lake East Bay Historic Summertime Mean Values

Agency	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	ACD	ACD	ACD	ACD	ACD	ACD	ACD	ACD	ACD	ACD	ACD
Year	1978	1984	1989	1990	1991	1993	1994	1995	1997	1998	1999	2000	2001	2002	2004	2006	2008	2010	2011	2012	2013
TP		48.0	54.0				33.0		28.0	29.8	20.6	25.8	42.3	29.6	33.7	41.7	36.8	39.0	27.0	26.0	23.2
Cl-a		16.2	16.4				15.8		12.6	14.4	9.4	14.6	17.6	14.8	16.6	17.6	19.5	9.8	9.6	8.2	6.5
Secchi (m)	1.11	1.50	1.80	1.68	1.62	1.83	1.86	1.93	1.72	1.76	2.26	2.04	1.82	1.90	1.81	1.80	1.55	1.90	2.00	2.10	2.68
Secchi (ft)	3.6	4.9	5.9	5.5	5.3	6.0	6.1	6.3	5.6	5.8	7.4	6.7	6.0	6.2	5.9	5.8	5.1	6.1	6.6	6.7	8.8
Carlsons trophic state indices																					
TSIP		60	62				55		52	53	48	51	58	53	55	58	56	57	52	51	49
TSIC		58	58				58		55	57	53	57	59	57	58	59	60	53	53	51	49
TSIS	58	54	52	53	53	51	51	51	52	52	48	50	51	51	51	52	54	51	50	49	46
TSI		57	57				54		53	54	50	53	56	54	55	56	57	54	51	51	48
Coon Lake Water Quality Report Card																					
Year	1978	1984	1989	1990	1991	1993	1994	1995	1997	1998	1999	2000	2001	2002	2004	2006	2008	2010	2011	2012	2013
TP		C	C				C		B	B	A	B	C	B	C	C	C	C	B	B	B+
Cl-a		B	B				B		B	B	A	B	B	B	B	B	B	A	A	A	A
Secchi	D	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C	C	C	C	C+	B
Overall	**D**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**B**	**B**	**A**	**B**	**C**	**B**	**C**	**C**	**C**	**B-**	**B**	**B**	**B+**

Carlson's Trophic State Index



2012 Coon Lake West Bay

Water Quality Data

Coon Lake West Bay

2012 Water Quality Data		Date	5/16/2012	5/30/2012	6/14/2012	6/29/2012	7/11/2012	7/24/2012	8/8/2012	8/22/2012	9/5/2012	9/19/2012			
		Time	9:30	9:20	10:45	9:35	10:00	10:30	10:40	10:05	10:15	9:20			
	Units	R.L.*	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Average	Min	Max
pH		0.1	8.72	7.87	8.12	8.29	8.16	8.25	8.41	8.68	8.23	7.94	8.27	7.87	8.72
Conductivity	mS/cm	0.01	0.157	0.152	0.145	0.148	0.126	0.117	0.159	0.156	0.145	0.129	0.14	0.117	0.159
Turbidity	FNRU	1.0	2	2	2	3	4	3	7	7	7	2	3.90	2	7
D.O.	mg/L	0.01	9.53	8.88					8.66	9.72	7.37	8.28	8.74	7.37	9.72
D.O.	%	1.0	98%	89%					105%	112%	88%	83%	0.96	83%	112%
Temp.	°C	0.10	18.9		20.1	24.0	27.9	27.9	25.3	22.4	24.5	16.2	23.02	16.2	27.9
Temp.	°F	0.10	66.0	32.0	68.2	75.2	82.2	82.2	77.5	72.3	76.1	61.2	69.30	61.2	82.2
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	µg/L	1.0	2.3	3.2	2.7	3.1	3.0	8.0	7.4	10.0	8.0	5.9	5.36	2.3	10.0
T.P.	mg/L	0.005	0.022	0.022	0.028	0.023	0.023	0.051	0.028	0.023	0.030	0.026	0.028	0.022	0.051
T.P.	µg/L	5	22	22	28	23	23	51	28	23	30	26	28	22	51
Secchi	ft	0.1	>10.6	>10.3	7.2	7.5	8.0	7.1	4.9	5.8	5.1	8.1	NA	4.9	>9.8
Secchi	m	0.1	>3.2	>3.1	2.2	2.3	2.4	2.2	1.5	1.8	1.6	2.5	NA	1.5	>3.0
Physical			2	2.0	2.0	2.0	3.0	2.0	2.0	4.0	4.0	2.0	2.5	2.0	4.0
Recreational			2	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	2.2	2.0	3.0

*Reporting Limit

Coon Lake West Bay Historic Summertime Mean Values

Agency	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	ACD	ACD
Year	1998	2002	2004	2005	2006	2007	2008	2009	2010	2012
TP									26.0	28.0
Cl-a									4.4	5.4
Secchi (m)	1.21	2.19	1.71	1.79	1.74	1.68	1.74	1.24		
Secchi (ft)	3.97	7.18	5.61	5.87	5.71	5.51	5.71	4.07		

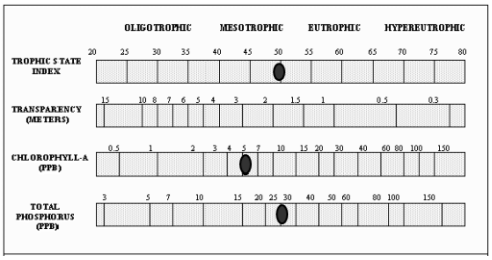
Carlsons trophic state indices

TSIP									51	52
TSIC									45	47
TSIS	57	49	52	52	52	53	52	57		
TSI									48	50

Coon Lake Water Quality Report Card

Year	98	2002	2004	2005	2006	2007	2008	2009	2010	2012
TP									B	B
Cl-a									A	A
Secchi	C	C	C	C	C	C	C	C		
Overall									**A-**	**A-**

Carlson's Trophic State Index



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.

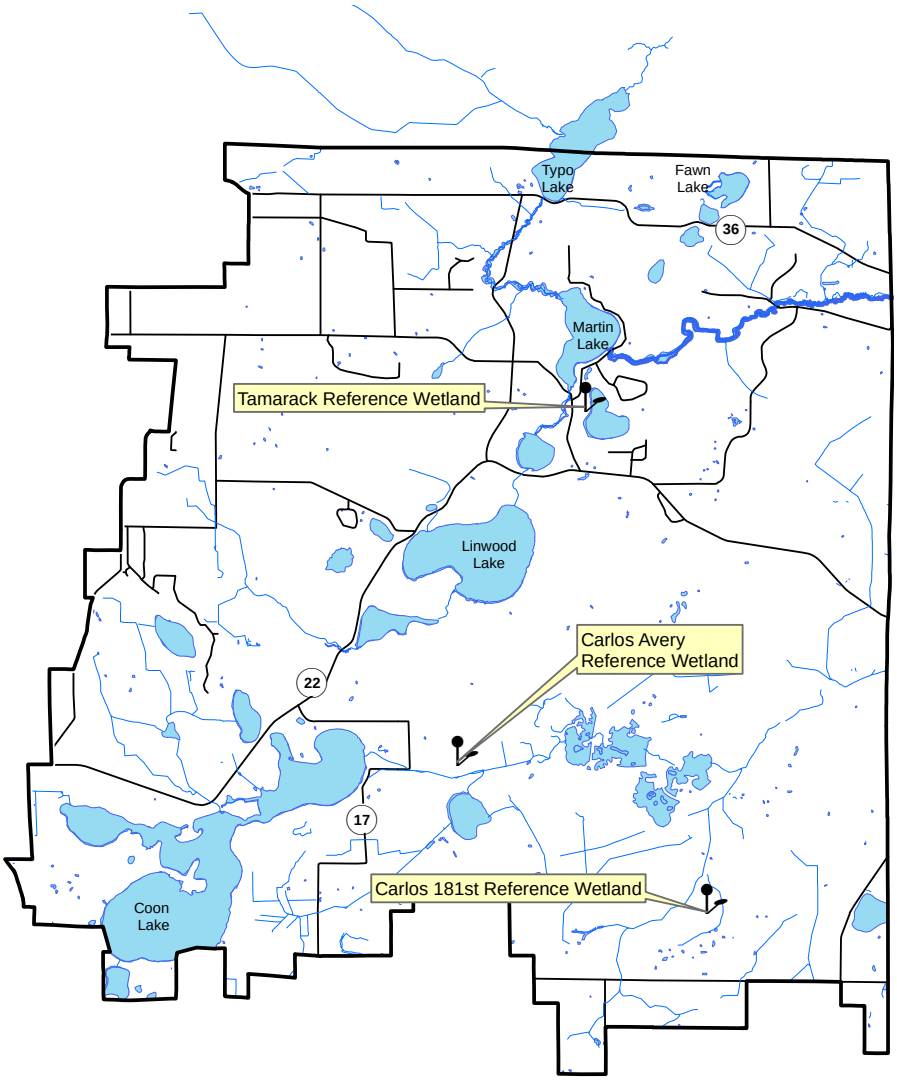
Locations: Carlos Avery Reference Wetland, Carlos Avery Wildlife Management Area, City of Columbus

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

Tamarack Reference Wetland, Linwood Township

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

Sunrise Watershed Wetland Hydrology Monitoring Sites

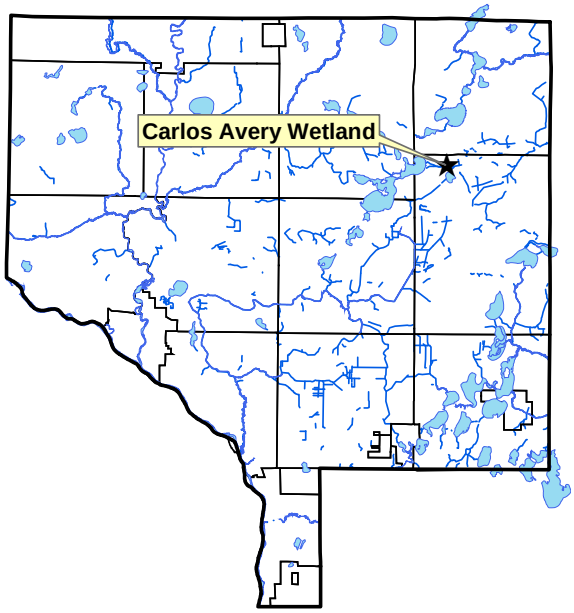


Wetland Hydrology Monitoring

CARLOS AVERY REFERENCE WETLAND

Carlos Avery Wildlife Management Area, City of Columbus

Site Information



Monitored Since: 1997

Wetland Type: 3

Wetland Size: >300 acres

Isolated Basin? No

Connected to a Ditch? Yes

Soils at Well Location:

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

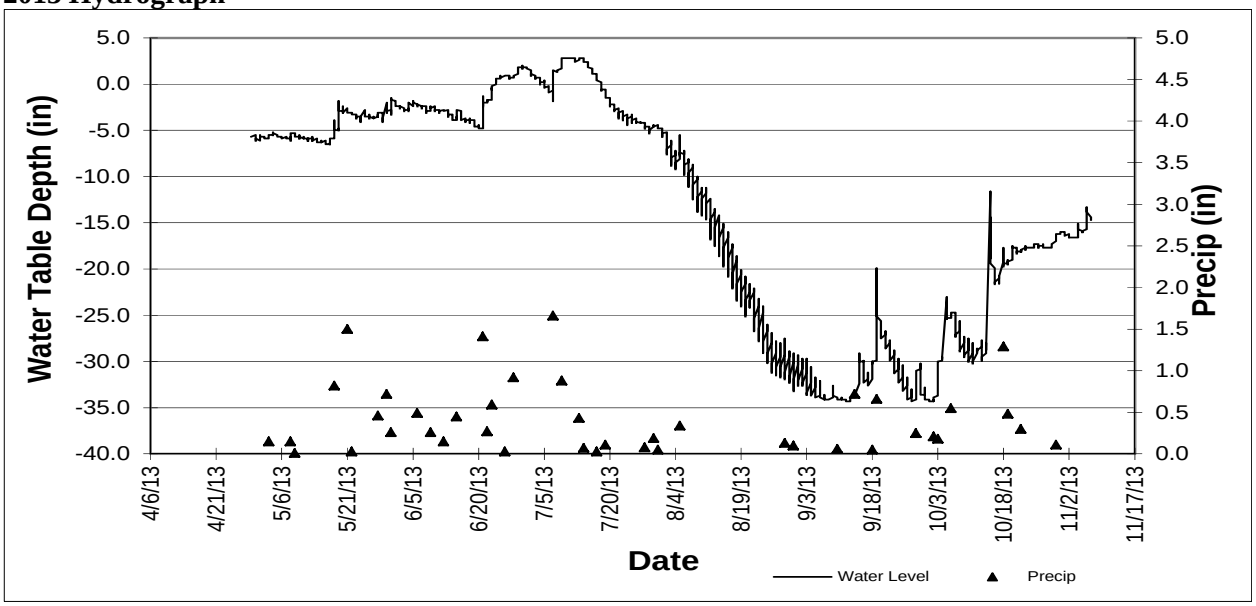
Surrounding Soils: Lino loamy fine sand

Vegetation at Well Location:

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

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

2013 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.

CARLOS 181ST REFERENCE WETLAND

Carlos Avery Wildlife Management Area, City of Columbus

Site Information

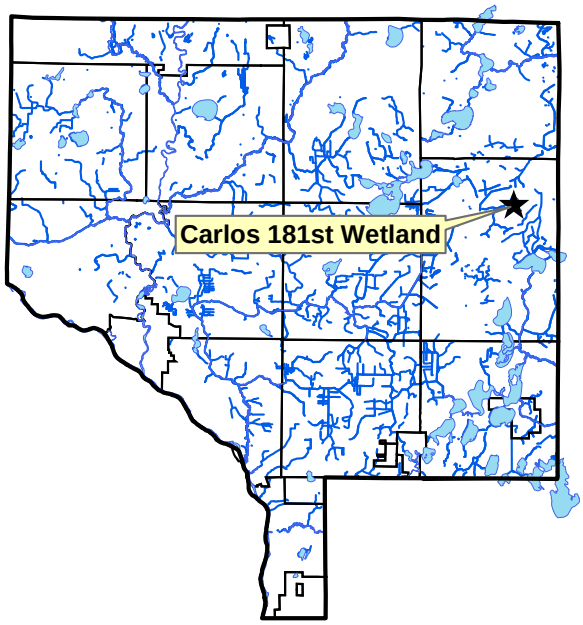
Monitored Since: 2006

Wetland Type: 2-3

Wetland Size: 3.9 acres (approx)

Isolated Basin? Yes

Connected to a Ditch? Roadside swale only



Soils at Well Location:

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

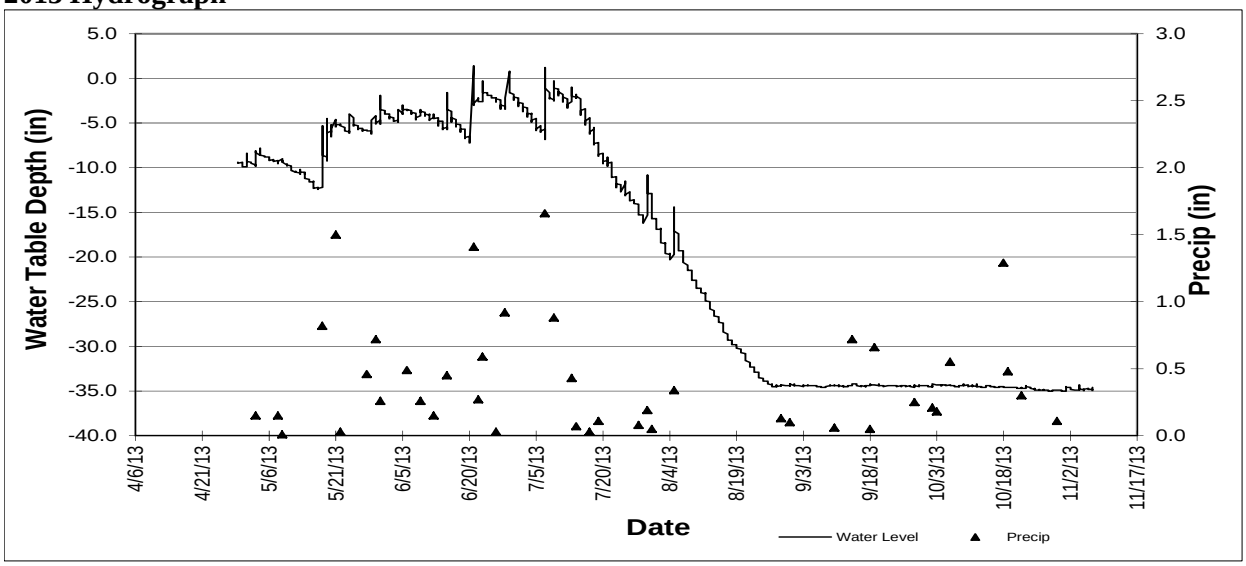
Surrounding Soils: Soderville fine sand

Vegetation at Well Location:

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

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

2013 Hydrograph



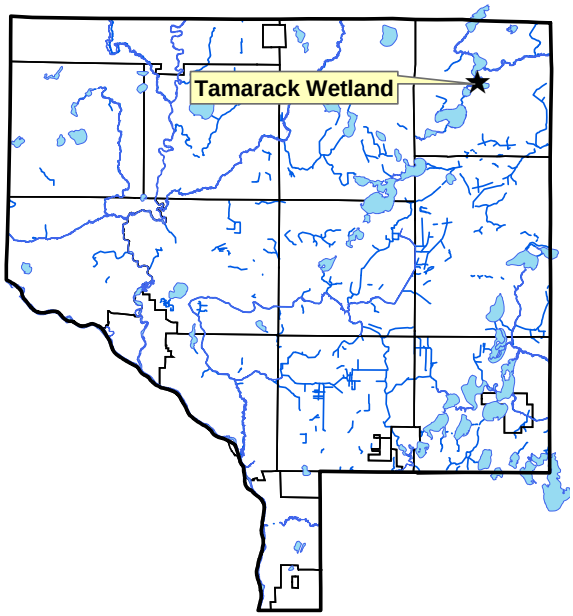
Well depths were 40 inches, so a reading of –40 indicates water levels were at an unknown depth greater than or equal to 40 inches.

Wetland Hydrology Monitoring

TAMARACK REFERENCE WETLAND

Martin-Island-Linwood Regional Park, Linwood Township

Site Information



Monitored Since: 1999

Wetland Type: 6

Wetland Size: 1.9 acres (approx)

Isolated Basin? Yes

Connected to a Ditch? No

Soils at Well Location:

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

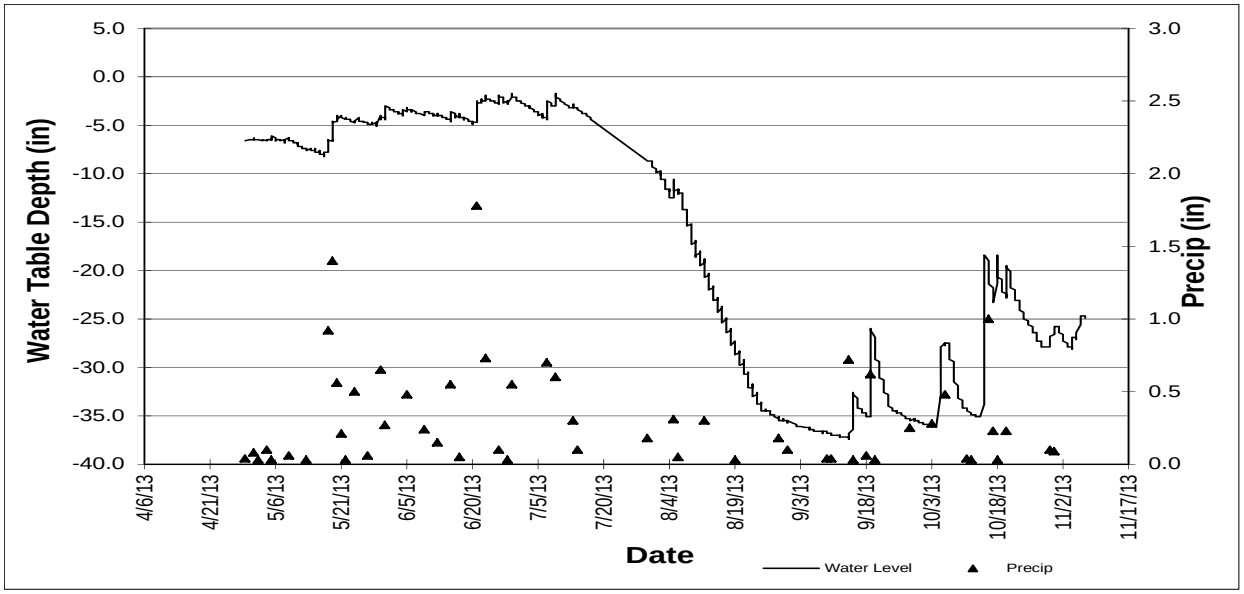
Surrounding Soils: Sartell fine sand

Vegetation at Well Location:

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

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

2013 Hydrograph



Well depth was 35 inches, so a reading of –35 indicates water levels were at an unknown depth greater than or equal to 35 inches.

Water Quality Grant Fund

Description: The Sunrise River Watershed Management Organization (SRWMO) offers cost share grants encourage projects that will benefit lake and stream water quality. These projects include lakeshore restorations, rain gardens, erosion correction, and others. These grants, administered by the ACD, offer 50-70% cost sharing of the materials needed for a project. The landowner is responsible for the remaining materials expenses, all labor, and any aesthetic components of the project. The ACD assists interested landowners with design, materials acquisition, installation, and maintenance.

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

Locations: Throughout the watershed.

Results: In 2012 one lakeshore restoration project at Linwood Lake was awarded a grant from this fund. Additionally, $4,300 was transferred out of this fund at the discretion of the SRWMO Board and directed to the Martin and Typo Lakes Carp Barriers project.

SRWMO Cost Share Fund Summary

2005 SRWMO Contribution	+	$1,000.00
2006 SRWMO Contribution	+	$1,000.00
2006 Expense - Coon Lake, Rogers Property Project	-	$ 570.57
2007 – no expenses or contributions		$ 0.00
2008 SRWMO Contribution	+	$2,000.00
2008 Expense - Martin Lake, Moos Property Project	-	$1,091.26
2009 SRWMO Contribution	+	$2,000.00
2010 SRWMO Contribution	+	$1,840.00
2011 SRWMO Contribution	+	$2,000.00
2012 SRWMO Contribution	+	$2,000.00
2012 Expense – Linwood Lake, Gustafson Property Project	-	$ 29.43
2012 Expense – Transfer to Martin-Typo Lakes Carp Barriers	-	$4,300.00
2013 – no expenses or contributions		$ 0.00
Fund Balance		**$5,848.74**

Coon Lake Area Stormwater Retrofit Analysis

Description: A Stormwater Retrofit Analysis is a systematic approach of identifying opportunities for improved stormwater treatment within a subwatershed of a high priority waterbody. Once stormwater retrofit options are identified, they are modeled to determine pollutant removal benefits. Costs for each potential project are estimated. Finally, the cost effectiveness of each project is calculated and projects are ranked accordingly. The final report serves as a guide for installing water quality projects in a cost effective manner.

Purpose: To improve Coon Lake water quality.

Results: The Anoka Conservation District (ACD) was contracted to complete a Stormwater Retrofit Analysis of the Coon Lake subwatershed. ACD performed watershed-wide field reconnaissance and completed GIS analysis. Potential projects have been assembled in a comprehensive list. Report preparation is in progress and will be delivered by March of 2014. Findings will be presented to WMO and lake groups.

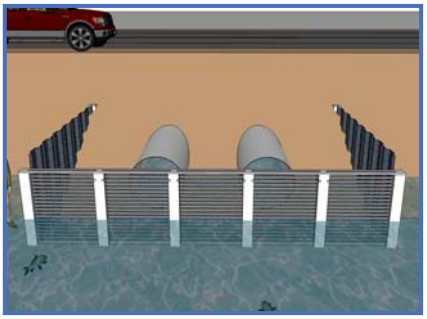
Carp Barriers Installation

Description: In 2013 the SRWMO provided $15,000 toward the installation of carp barriers in the Martin and Typo Lake system. This project will improve water quality in Martin and Typo Lakes by controlling carp with strategically placed barriers and increased commercial harvests. Both lakes fail to meet state water quality standards due to excessive phosphorus which fuels algae blooms. As a result, the lakes are often strongly green or brown and the game fishery is depressed. Carp are a major cause of poor water quality in these lakes, diminishing their value for swimming, boating, and fishing.

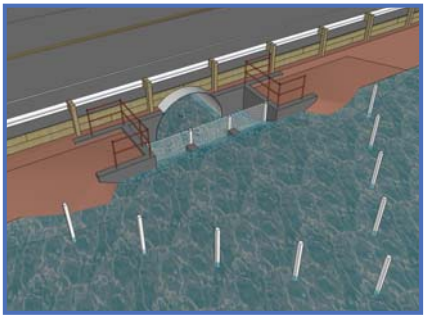
Barriers are an effective strategy for carp control because Typo and Martin Lake each provide something important for carp, and moving between the lakes is important to their success. Martin Lake is deeper, and good for overwintering. Typo Lake and Typo Creek are shallow and good for spawning. Stopping migrations between the lakes with barriers will reduce overwintering survival and spawning success. Even more, barriers will allow successful commercial carp harvests.

Purpose: To improve water quality.

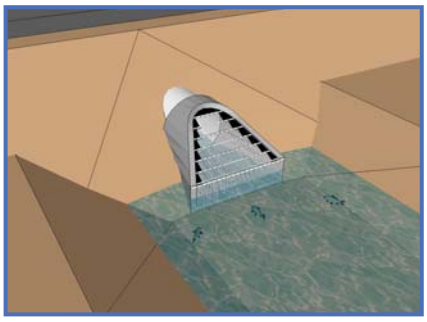
Results: Construction bidding occurred in late 2013. Bids exceeded the allowed budget. The project was placed on hold while an existing state grant was returned and a new grant was pursued. A new grant for more funds was secured in December 2013. The funds provided by the SRWMO have been held and will be used for the upcoming project construction.



Concept- Typo Lake outlet and North Inlet of Martin Lake. Horizontal screens which are removable. Top of the screens serve as an emergency overflow. A maintenance catwalk and railing (not shown) will be included.



Concept - Martin Lake outlet
Two sets of pivoting bars allow passage of debris but prevent carp from jumping from the creek into the lake. Diversion posts in the lake prevent larger debris from becoming entangled in the weir.



Concept—South Inlet of Martin Lake
Vertical swinging bars on the downstream end of culverts allow passage of debris but prevent carp from swimming upstream.

Lakeshore Landscaping Education

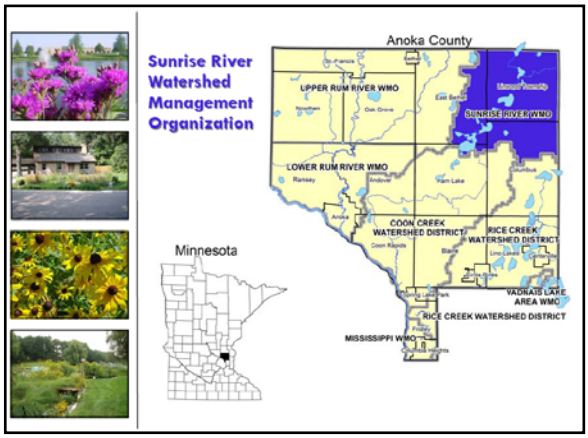
Description: One goal of the Sunrise River WMO is to encourage and facilitate lakeshore restorations with native plants. These projects, usually accomplished by homeowners with assistance from agencies like the SRWMO, are beneficial to overall lake health. By planting native plants at the shoreline runoff into the lake is filtered, and fish and wildlife habitat is substantially improved. To move toward its goal, the SRWMO does regular education and marketing of lakeshore restorations to homeowners.

Purpose: To improve lake water quality and lake health.

Results: Lakeshore Landscaping & Raingarden Display Board – ACD constructed a 3-panel self-standing display board comprised of information on both rain gardens and lakeshore landscaping. The display was presented by board members at Linwood Family Fun Day, East Bethel Booster Days, Columbus Arbor Day, and Lake Association meetings.

Postcard about grant availability – A postcard was designed by ACD illustrating the availability of cost share grants for water quality improvement projects in the SRWMO. These postcards were issued to SRWMO board members to be distributed at community events.

Lakeshore Restoration Brochures – ACD provided the SRWMO with brochures on lakeshore restoration to be distributed at their community event displays.



Blue Thumb membership – Blue Thumb is a consortium of Minnesota agencies, plant nurseries, landscapers, and others who share resources in their efforts to promote the use of native plants to improve water quality through shoreline stabilizations, rain gardens, and native plant gardens. Resources that are shared amongst Blue Thumb members include pre-fab marketing materials, displays, how-to manuals, and others. The ACD enrolled the SRWMO in Blue Thumb and performed all necessary administration to maintain the membership and renew it in 2013.

Blue Thumb
PLANTING FOR CLEAN WATER®

The ACD manages the SRWMO's Blue Thumb membership by submitting annual membership applications and tracking SRWMO contributions. Maintaining a Blue Thumb membership requires an annual contribution of either $1,500 cash or 30 hours of efforts. The SRWMO chooses to meet this requirement by incorporating Blue Thumb into a variety of tasks that are already planned and benefit from Blue Thumb (including those listed above). In 2013 the SRWMO exceeded the 30 hour commitment with the following work:

- Postcard with information on grant availability
- Presentations at Linwood Family Fun Day, East Bethel Booster Days, and Columbus Arbor Day
- Grant applications for potential projects.
- Martin Lake rain garden maintenance.

Annual Education Publication

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

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

Results: In 2013 the SRWMO contracted with the ACD to write the annual newsletter and provide it to member communities for distribution in their newsletters. Topics for annual newsletter were discussed by the SRWMO Board, and the Sunrise River WRAP was chosen. The article was also to include the new SRWMO website address and general organizational information.

Limited space in city newsletters was recognized as an issue. A full length (below) and summarized version of an article were created. It was provided to member cities for their city newsletters in July.

SRWMO 2013 newsletter article, which was published in member city newsletters:

Sunrise River, Local Lakes WRAP Nears Completion

An effort is underway to protect and improve water quality in the entire Sunrise River watershed. The watershed of 381 square miles includes northeast Anoka County and parts of Chisago, Isanti, Washington, and Pine Counties. It is known for abundant lakes and wild, meandering streams. Unfortunately, it also has some water quality problems. This is concerning for its own sake but also because it drains to the St. Croix River. In Anoka County the following water bodies fail to meet state water quality standards and are deemed "impaired:"

Linwood Lake is one impaired waterbody covered by management plans under development.

- *West Branch of the Sunrise River, which flows through Martin Lake (pH, turbidity, fish, macroinvertebrates)*
- *South Branch of the Sunrise River, which flows through the Carlos Avery WMA (dissolved oxygen)*
- *Linwood, Martin, and Typo Lakes Lake (nutrients)*
- *Various others (mercury in fish tissue, addressed by other state efforts)*

Work underway is in two parts:

First, a Total Maximum Daily Load (TMDL) study is nearly complete. This technical document is required by the Federal Clean Water Act and specifies the amount by which pollutants need to be reduced to meet water quality standards.

It applies to the impaired waters listed above, except Martin and Typo Lakes which already have a separate TMDL. A public comment period will be open later this year.

Secondly, a Watershed Restoration and Protection Plan (WRAP) is being drafted. It builds from the TMDL by prescribing work needed to improve water quality, including locations and approaches. It looks at both improving impaired waters and protecting good water quality where it exists. Projects identified are eligible for greater State funding, but must be locally led.

Locally, the Sunrise River Watershed Management Organization (SRWMO) is central to managing these water bodies. The SRWMO is a joint powers organization covering Linwood Township and parts of Columbus, East Bethel, and Ham Lake. To learn more visit www.SRWMO.org.

More about these projects in the Sunrise River Watershed can be found on the MN Pollution Control website. Specific questions can be directed to Jamie Schurbon at the Anoka Conservation District – jamie.schurbon@anokaswcd.org or 763-434-2030 ext. 12.

SRWMO Website

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

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

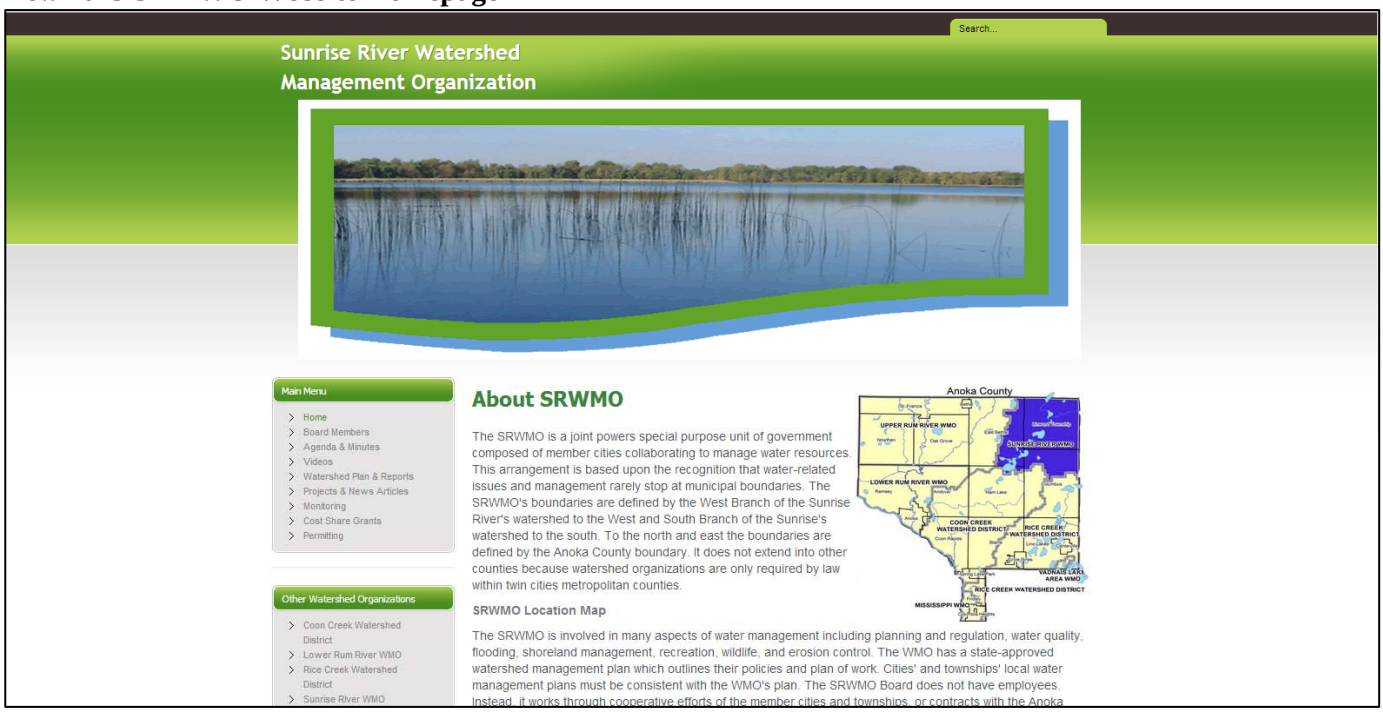
Location: www.SRWMO.org

Results: In 2013 the upgraded, redesigned, and re-launched the SRWMO website. These updates were necessary because the old website platform was incompatible with certain tablet computers and smartphones. Additionally, the old website was hosted with in the ACD website, while the new website is completely independent, offering the WMO future management choices.

Regular website updates also occurred throughout the year. The SRWMO website contains information about both the SRWMO and about natural resources in the area.
Information about the SRWMO includes:

- a directory of board members,
- meeting minutes and agendas,
- the watershed management plan and information about- plan updates,
- descriptions of work that the organization is directing,
- highlighted projects.

New 2013 SRMWO Website Homepage



Grant Searches and Applications

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

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

Results: At the direction of the SRWMO Board, in 2013 ACD staff prepared one grant request in cooperation with the SRWMO – a BWSR Clean Water Fund Request for installation of Coon Lake Area Stormwater Retrofits. Work included:

- Preparing and submitting the project budget and application.
- Securing letters of support from the SRWMO, Coon Lake Improvement Association, Coon Lake Improvement District, and Coon Lake Beach Community Center.
- Securing cash in-kind matching dollars totaling $5,000 from the three Coon Lake civic groups.

The total grant request was $42,987. The outcome will be known in January 2014.

SRWMO 2012 Annual Report to BWSR and State Auditor

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

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

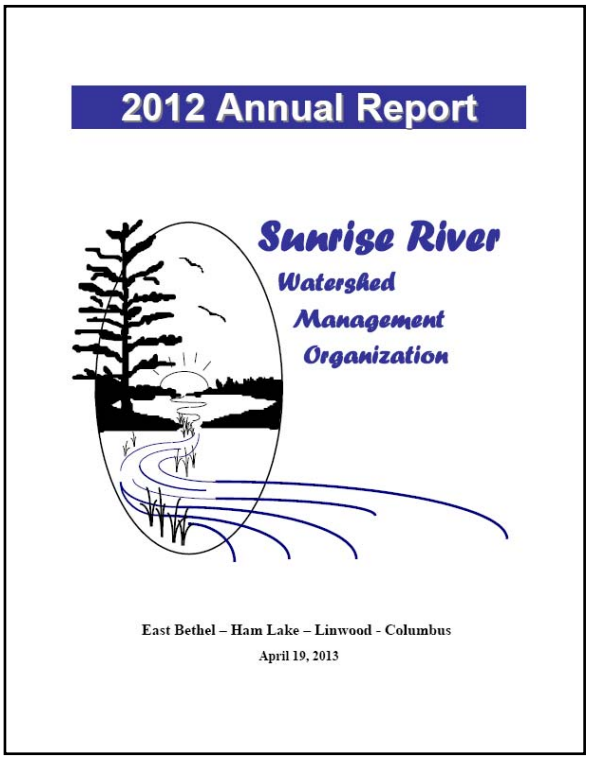
Purpose: To document progress toward implementing the SRWMO Watershed Management Plan and to provide transparency of government operations.

Locations: Watershed-wide

Results: Anoka Conservation District (ACD) assisted the SRWMO with preparation of a 2012 Sunrise River WMO Annual Report. ACD drafted the report and a cover letter. After SRWMO Board review the final draft was forwarded to BWSR on April 25, 2013. A sufficient number of copies of the report were sent to each member community to ensure that each city council person and town board member would receive a copy. The report is available to the public on the SRWMO website.

ACD simultaneously performed annual reporting to the State Auditor through their SAFES website. This report consists of a 10-worksheet Excel file.

Cover



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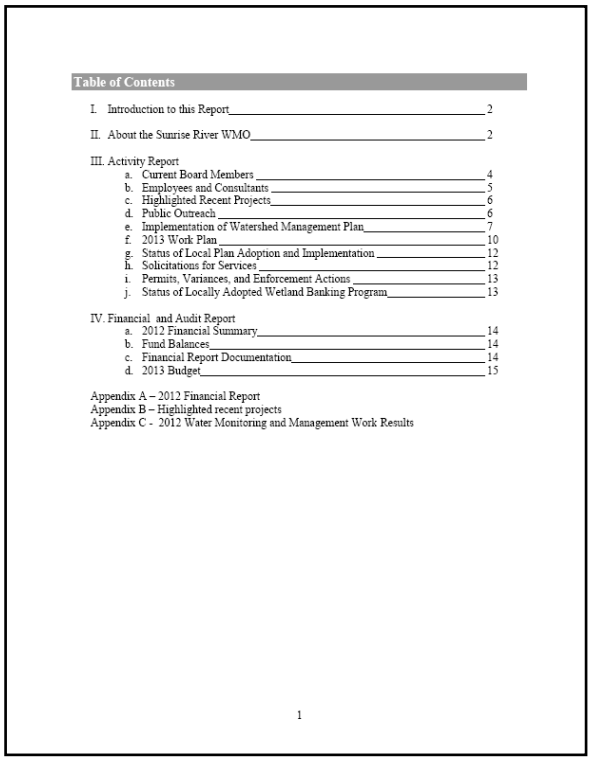
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1

On-call Administrative Services

Description: The Anoka Conservation District Water Resource Specialist provides limited, on-call administrative assistance to the SRWMO. Tasks are limited to those defined in a contractual agrenement.

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

Results: In 2013 a total of 15.5 hours of administrative assistance have occurred as of December 19. Additional hours creating, presenting, and editing the 2015 budget are anticipated and will likely bring the total to the 20.5 hours allowed annually.

The following tasks were accomplished:

- 2014 budget preparation and related questions from cities.
- Annual reporting reminders to member cities and receive those reports.
- Prepared and submitted Blue Thumb member agreement.
- Meeting packet preparation and portions of meeting attendance not related to projects.
- Provide material for RFP for professional services.
- Meeting with E. Bethel council member about stormwater retrofit ideas.
- Provided Linwood & Met Council with evidence that the townshiop may adopt the WMO plan as their local water plan. This had been a reason Met Council had denied Linwood's comp plan. Fielded various other questions from Met Council about the WMO's requirements for Linwood Township.
- Occasional inquiries from contractors and developers about any SRWMO permitting requirements.
- Assist with compiling agendas and meeting packets.

Financial Summary

ACD accounting is organized by program and not by customer. This allows us to track all of the labor, materials and overhead expenses for a program. We do not, however, know specifically which expenses are attributed to monitoring which sites. To enable reporting of expenses for monitoring conducted in a specific watershed, we divide the total program cost by the number of sites monitored to determine an annual cost per site. We then multiply the cost per site by the number of sites monitored for a customer.

Sunrise River Watershed Financial Summary

Sunrise River Watershed	Volunteer Precip	Ref Wet	Ob Well	Lake Lvl	Lake WQ	SRWMO Admin	SRWMO On-Call Admin	WMO Annual Rpts to State	WMO Grant Search	SRWMO Outreach/Promo	WMO Website Maint	WMO Website Migration	Martin/Typo Carp Bariers	Sunrise River WRAPP	Moore Lake SRA	Coon Lake SRA	Projects	Total
Revenues																		
SRWMO	0	1680	0	1000	0	0	1500	1025	1000	1500	405	800	0	0	0	10416	0	19326
State	0	0	261	0	0	0	0	0	0	0	0	0	8540	0	0	0	0	8801
Anoka Conservation District	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anoka Co. General Services	0	0	353	0	0	0	0	0	2230	0	0	51	1193	33	0	0	0	3861
County Ag Preserves	0	0	0	0	1028	0	0	0	0	0	0	0	0	0	0	0	48	1076
Regional/Local	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Service Fees	0	0	0	0	358	0	0	0	0	0	0	0	0	2590	0	0	404	3353
BWSR Cons Delivery	0	0	0	0	0	511	0	0	0	498	0	0	0	0	0	902	0	1910
BWSR Cost Share TA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441	441
Local Water Planning	236	0	65	7	594	0	0	0	0	0	0	0	0	0	0	0	0	902
TOTAL	236	1680	679	1007	1980	511	1500	1025	3230	1998	405	851	9734	2623	0	11318	893	39670
Expenses-																		
Capital Outlay/Equip	1	16	8	13	24	5	12	4	71	28	5	9	80	39	0	211	14	541
Personnel Salaries/Benefits	197	1014	569	857	1372	446	889	502	2571	1679	316	451	7222	2185	0	8853	740	29863
Overhead	21	67	45	58	92	27	92	47	156	106	28	29	706	152	0	746	53	2425
Employee Training	1	4	2	5	8	5	3	0	14	4	1	1	24	14	0	22	3	109
Vehicle/Mileage	3	17	9	16	24	10	12	6	44	25	5	6	105	39	0	122	12	455
Rent	12	46	29	38	62	18	54	29	110	78	18	21	422	99	0	478	36	1549
Program Participants	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Supplies	0	1	0	0	350	0	0	0	0	39	0	312	1000	0	0	0	1	1703
McKay Expenses	1	19	17	19	49	0	42	0	264	39	13	22	175	95	0	885	36	1676
TOTAL	236	1183	679	1007	1980	511	1104	590	3230	1998	385	851	9734	2623	0	11318	893	38321
NET	0	497	0	0	0	0	396	435	0	0	20	0	0	0	0	0	0	1349

Recommendations

- **Participate the Sunrise River Watershed Restoration and Protection Project (WRAPP)** which is led by Chisago SWCD and MPCA. It will result in TMDLs for the Sunrise River and Linwood Lake. The next SRWMO plan will likely be strongly encouraged to implement the WRAPP.
- **Install stormwater retrofits around Coon Lake.** A stormwater assessment is being completed. It identifies and ranks stormwater retrofit projects that will benefit lake water quality. A state grant has been secured.
- **Install the Martin and Typo Lake carp barriers.**
- **Continue efforts to secure grants.** A number of water quality improvement projects are being identified. Outside funding will be necessary for installation of most of these. These projects should be highly competitive for those grants.
- **Bolster lakeshore landscaping education efforts.** The SRWMO Watershed Management Plan sets a goal of 3 lakeshore restorations per year. Few are occurring. Fresh approaches should be welcomed.
- **Increase the use of web videos as an effective education and reporting tool.**
- **Continue the SRWMO cost share grant program** to encourage water quality projects.
- **Encourage communities to report water quality projects to the SRWMO.** An overarching goal in the SRWMO Plan is to reduce phosphorus by 20% (986 lbs). State oversight agencies will evaluate efforts toward this goal. Both WMO and municipal project benefits should be counted.