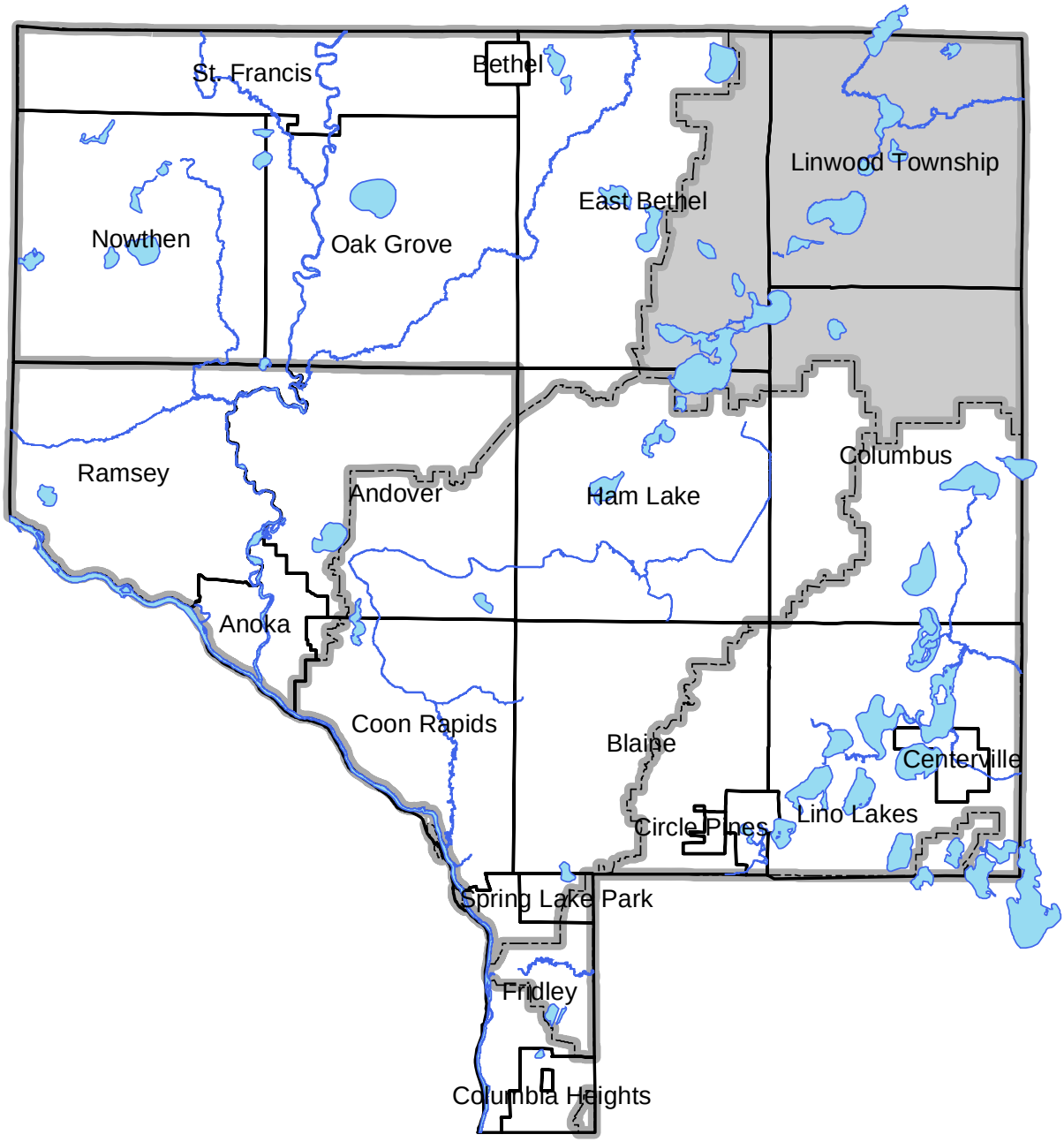
Excerpt from the
2011 Anoka Water Almanac

Chapter 2: Sunrise River Watershed



Prepared by the Anoka Conservation District

CHAPTER 2:
SUNRISE RIVER WATERSHED

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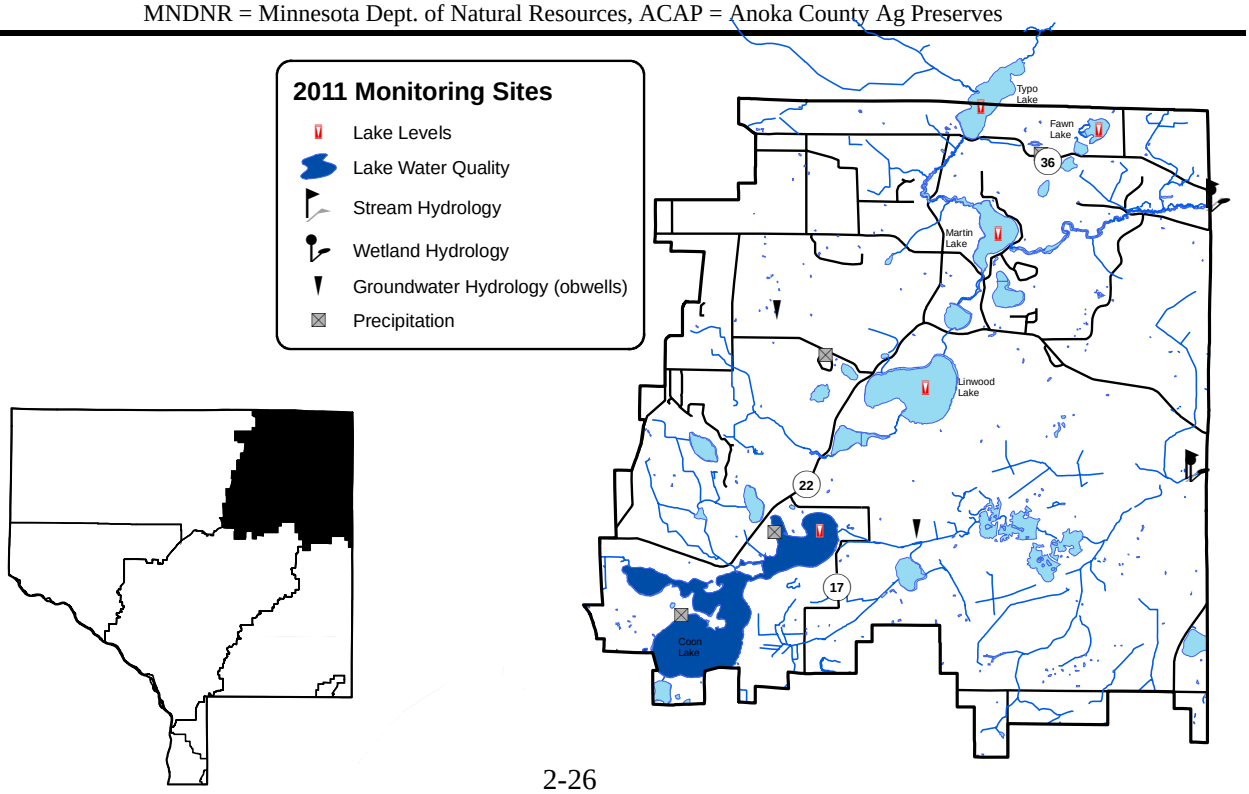
ACD = Anoka Conservation District, SRWMO = Sunrise River Watershed Management Organization,
MNDNR = Minnesota Dept. of Natural Resources, ACAP = Anoka County Ag Preserves



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).

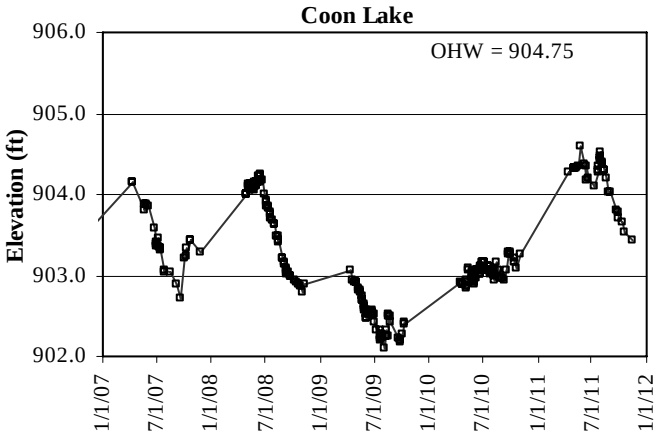
Purpose: To understand lake hydrology, including the impact of climate or other water budget changes. These data are useful for regulatory, building/development, and lake management decisions.

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

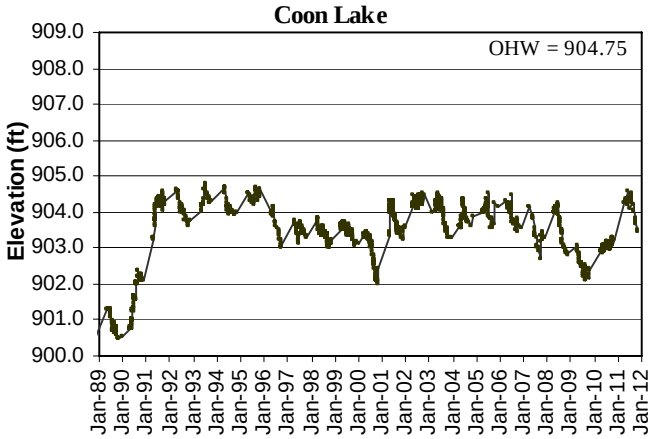
Results: Lake levels were measured by volunteers 23 to 58 times throughout 2011, depending upon the lake. All lakes had sharply increasing water levels in spring and early summer 2011 when extremely high rainfall totals occurred. Generally, water levels in the lakes peaked around May 23. Fawn Lake, which more closely follows groundwater levels than the other lakes, peaked about a month later. Coon Lake had second peaks around August 2, nearly as high as the first. At their peaks, lake levels were up to nearly a foot greater than seen in recent years. Coon Lake was within 0.52 feet of a record high, while Linwood was within 0.3 feet. Other lakes did not approach record highs. After these peaks, all lake levels fell continuously during late summer and fall when very little precipitation fell and drought approached.

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.

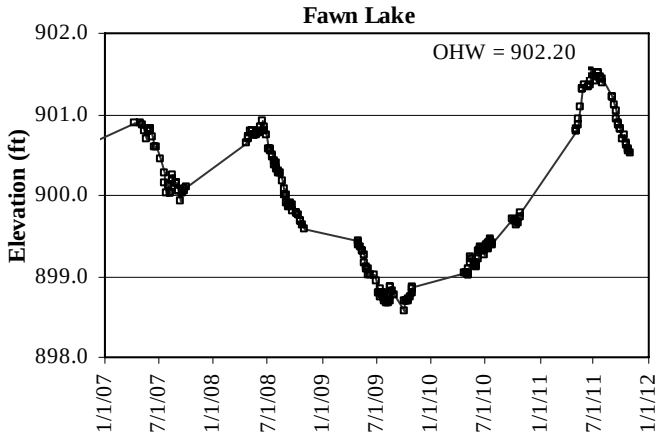
Coon Lake Levels 2007-2011



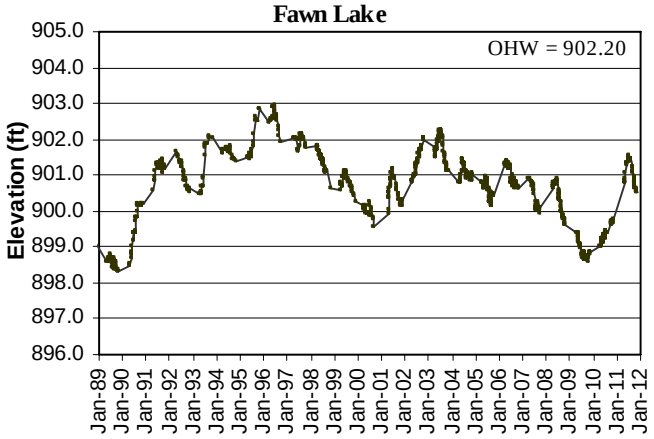
Coon Lake Levels 1990-2011



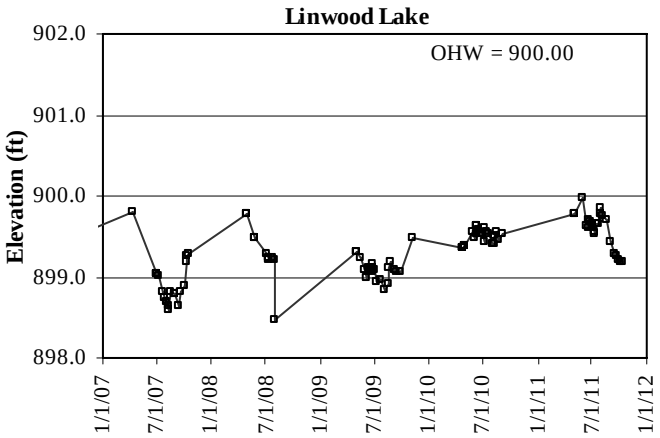
Fawn Lake Levels 2007-2011



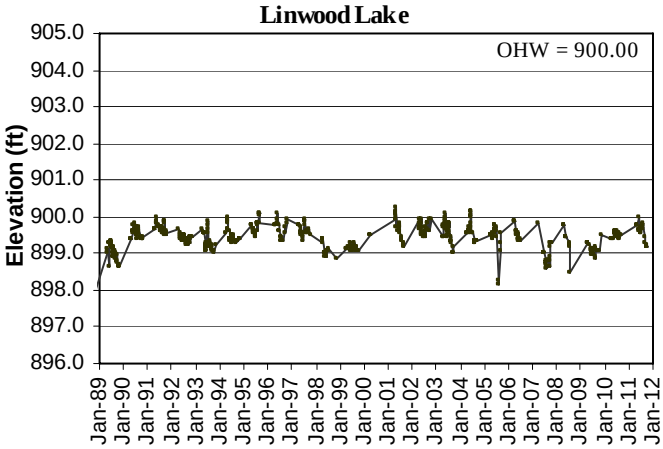
Fawn Lake Levels 1990-2011



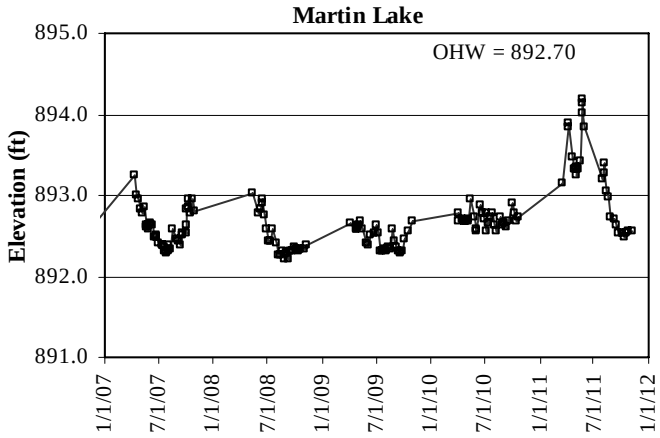
Linwood Lake Levels 2007-2011



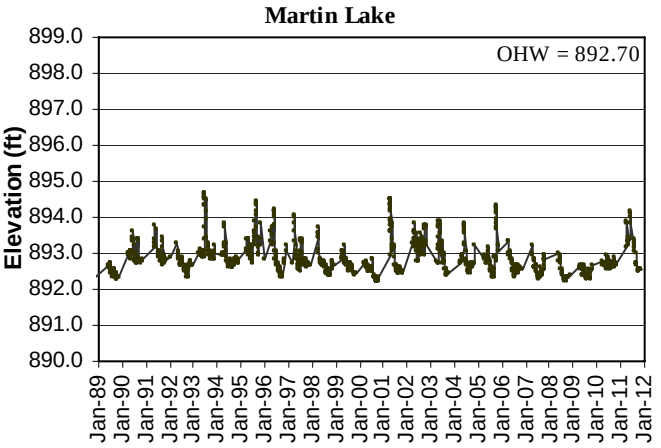
Linwood Lake Levels 1990-2011



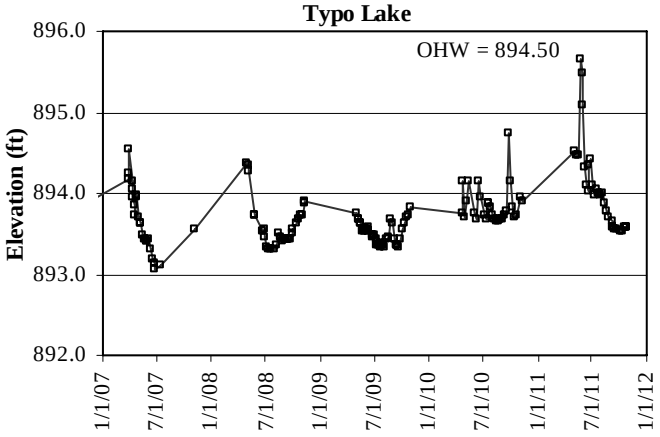
Martin Lake Levels 2007-2011



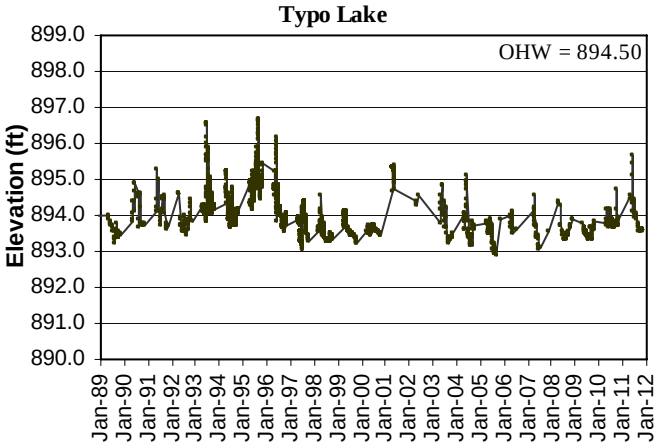
Martin Lake Levels 1990-2011



Typo Lake Levels 2007-2011



Typo Lake Levels 1990-2011



Lake Water Quality (volunteer)

Description: The SRWMO wishes to establish volunteers who on all major recreational lakes who will monitor water quality in years when professional monitoring is not occurring. Volunteers collect a more limited suite of data than professionals, usually just Secchi transparency. However this is fundamentally the most important data. The volunteers are coordinated through the MN Pollution Control Agency's Citizen Lake Monitoring Program (CLMP).

The SRWMO wished to establish volunteers and lakes where none currently exist. This included Typo, Linwood, and Fawn Lakes.

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. To ensure fundamental data is collected in years that professional monitoring

Locations: Typo Lake

Linwood Lake

Fawn Lake

Results: The Anoka Conservation District solicited and secured volunteers to monitor water quality on the three lakes where none already existed. ACD signed them up for the CLMP program. The MN Pollution Control Agency then provided these volunteers with the necessary equipment. Volunteers submit their data to the MPCA, and it is available to the public on their website.

Volunteers monitoring lake water quality in the SRWMO include:

Typo Lake	Chris Anderson
Linwood Lake	Vern Cardwell
Martin Lake	Frank Kvidera
Coon Lake	Doug Tierney, John Harvey, Arlan Mercil, and Goldie Johnson
Fawn Lake	Dorothy Damon

Lake Water Quality (professional)

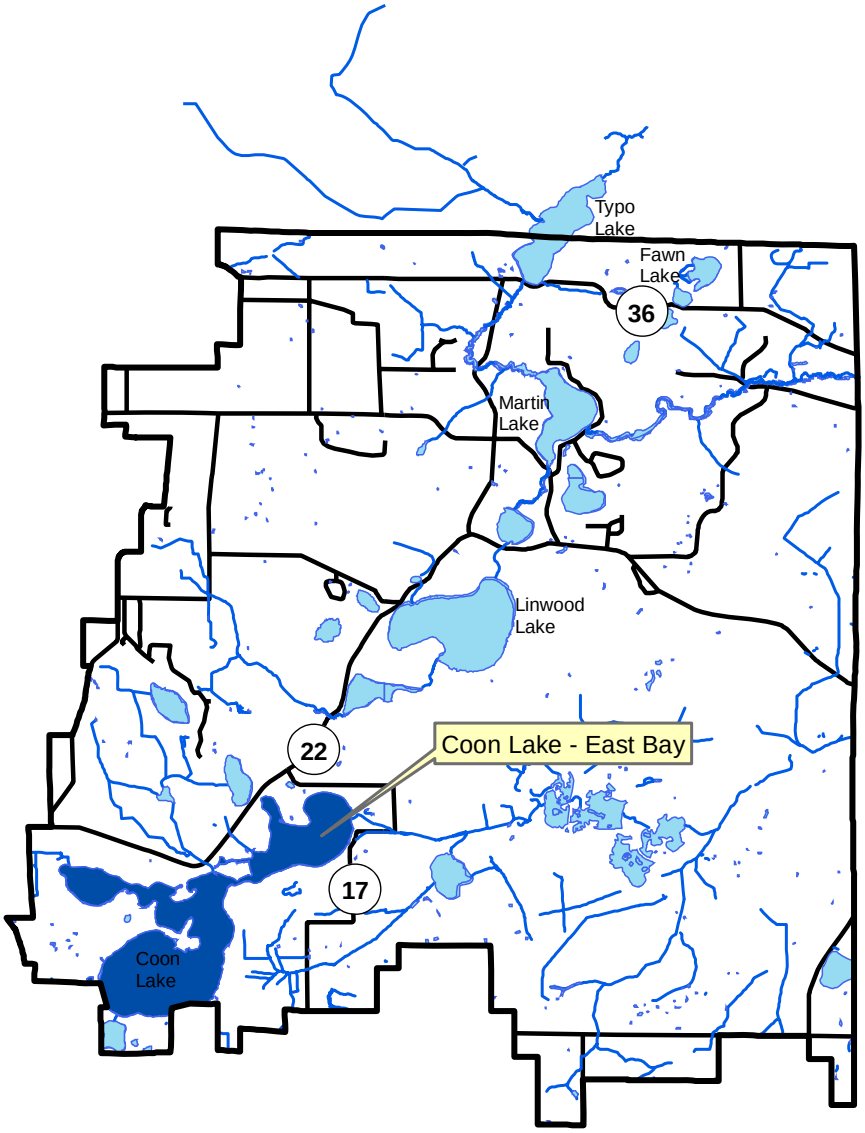
Description: May through September every-other-week monitoring of the following parameters: total phosphorus, chlorophyll-a, secchi transparency, dissolved oxygen, turbidity, temperature, conductivity, pH, and salinity.

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

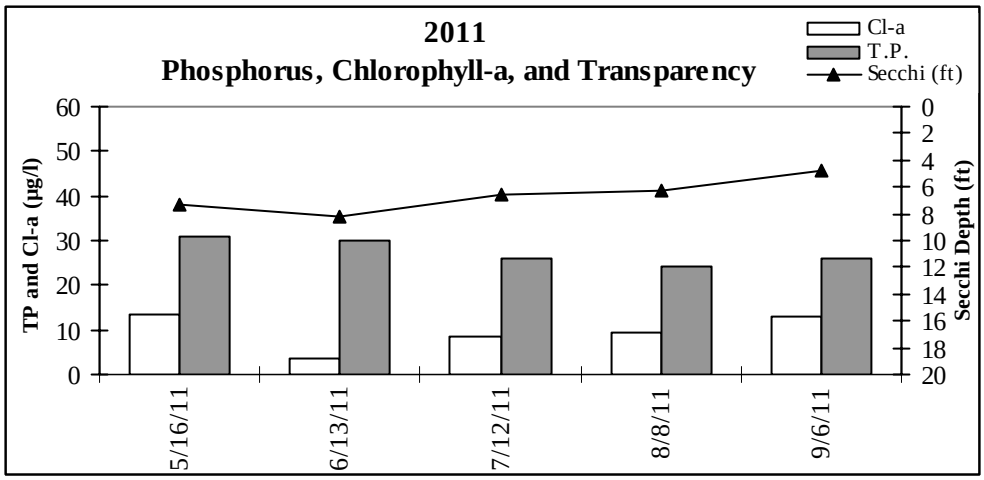
Coon Lake is located in east central Anoka County and is the county's largest lake. Coon Lake has a surface area of 1498 acres and a maximum depth of 27 feet (9 m). Public access is available at three locations with boat ramps, including one park with a swimming beach. The lake is used extensively by 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 separate information for the East Bay (aka northeast or north bay) in 2011 and West Bay (aka southwest or south bay) of Coon Lake in 2011. The 2010-11 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; data from other years do not lend themselves well to direct comparisons because monitoring regimes were likely different.

2011 Results – East Bay

In 2011 the East Bay was monitored once every four weeks. It had slightly better than average water quality for this region of the state (NCHF Ecoregion), receiving a B grade. Average values of important water quality parameters included 27 ug/L for total phosphorus, 9.6 ug/L chlorophyll-a, and Secchi transparency of 6.6 feet. Chlorophyll-a levels were the lowest of all monitored years. Phosphorus and transparency were similar to previous 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 until August and September, when there was a slight algae impairment.

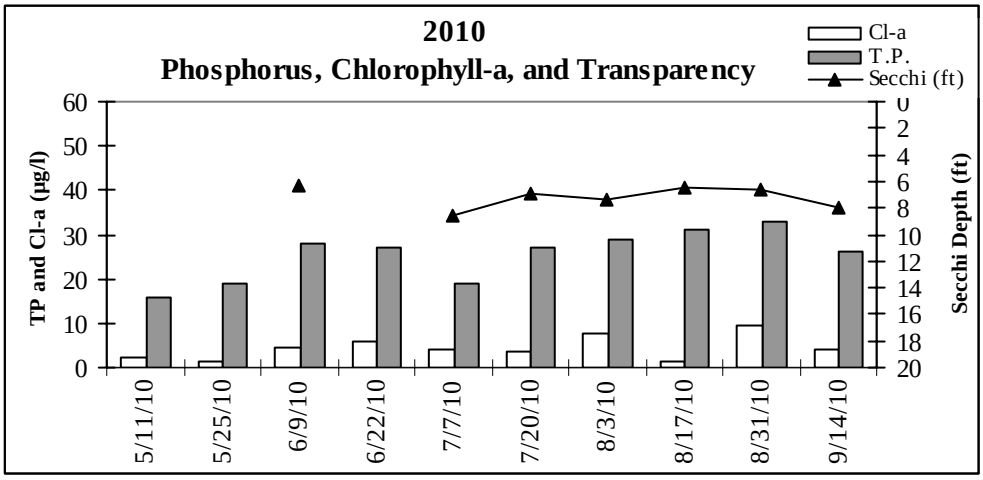
2011 Water Quality Results – East Bay



2010 Results – West Bay

In 2010 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 26.0 µg/L and chlorophyll- averaged 4.4 µg/L. Secchi transparency could not be measured on three occasions because it exceeded basin's depth.

2010 Water Quality Results –West Bay



Comparison of the Bays

The East and West Bays of Coon Lake have noticeably different water quality. In 2010 both bays were monitored simultaneously. 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). A direct comparison of average Secchi transparency is not possible because transparency exceeded the lake depth on three occasions in the West Bay and a reading could not be obtained. It is noteworthy, however, that the poorest Secchi transparency in the West Bay was greater than the average in the East Bay.

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

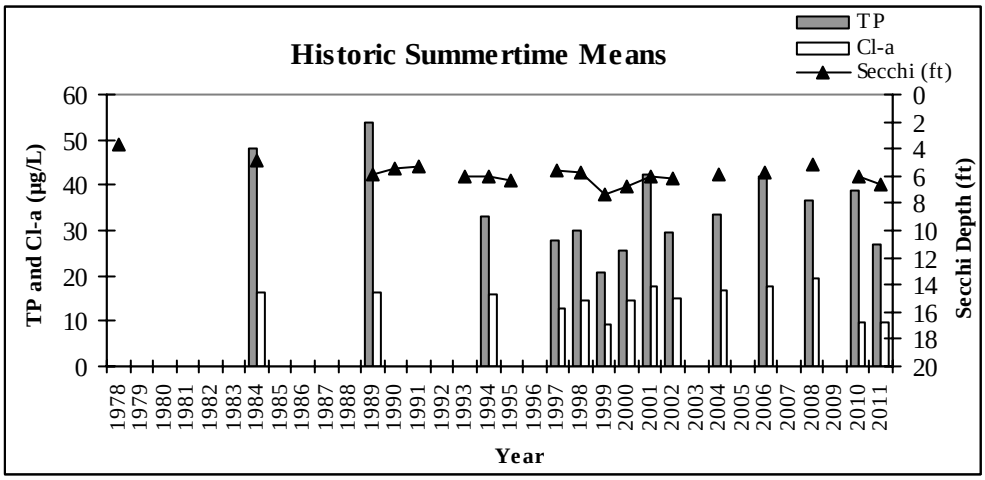
In the East Bay nineteen years of water quality data have been collected since 1978. During the most recent 11 years that were monitored (since 1996), the data collected included total phosphorus, chlorophyll-a, and Secchi transparency. For most of the other eight years (all pre-1997) only Secchi transparency data is available. This provides an adequate dataset for a trend analysis, however given that most of the data is from the last 20 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. This is our preferred approach because it examines all three parameters simultaneously. This analysis indicated no trend ($F_{2,11}$=1.0, p=0.4).

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 ($F_{1,17}$=8.9, p=0.008). However, this trend is driven by unusually poor transparency in 1978 of 1.11 m. We examined the data from that year and found that no transparency readings were collected in May, when water is often clearest. This would have driven the average transparency down. Therefore, we feel it is appropriate to exclude the 1978 data. When this is done, the trend is no longer statistically significant ($F_{1,16}$=2.35, p=0.14).

It is noteworthy that a water quality improvement seems to have occurred between 1989 and 1994 (see graph below). The reason for such a change, if real, is unknown. Because there are only two years of phosphorus and chlorophyll-a data before 1994 it is difficult to determine if water quality was chronically poorer prior to 1994 or if the available monitoring data is not representative of typical conditions.

Historic Water Quality - East Bay

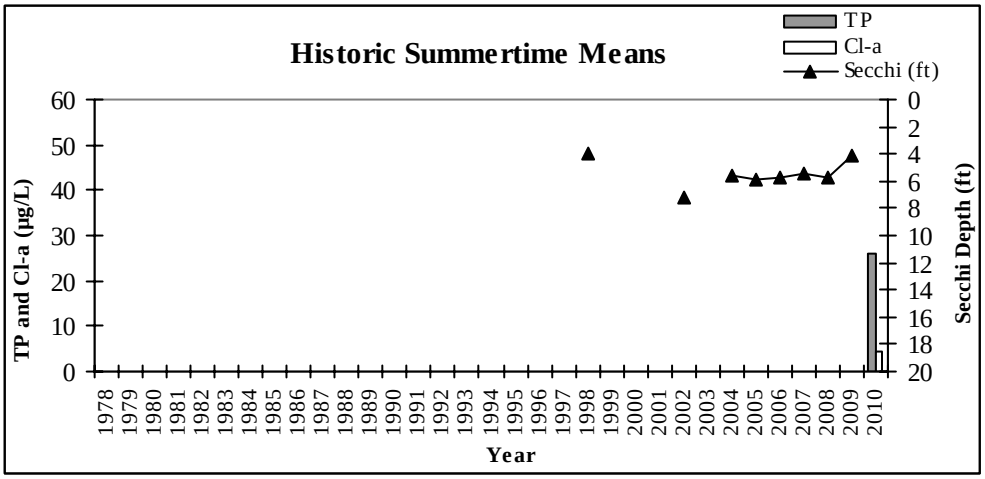


West Bay Trend Analysis

Nine years of data are available for the West Bay including only one year with phosphorus and chlorophyll-a data, so a powerful trend analysis is not possible. We can analyze just Secchi transparency data, but this also has a weakness: 2010 must be excluded because a full suite of Secchi measurements is not available due to clarity exceeding the lake depth occasionally. Despite these limitations, we examined the Secchi data for any trends.

A one-way ANOVA was performed with Secchi transparency from 1998 to 2009 as the response variable. No water quality trend exists ($F_{1,6}$=0.0036, p=0.95). Looking at the data superficially (see graph below), small variations among years is seen but no trend is apparent.

Historic Water Quality - West Bay



Discussion

While Coon Lake is not listed as "impaired" by the MN Pollution Control Agency, the East Bay is close to the state water quality standard of 40 µg/L of phosphorus or greater. In 2006 phosphorus averaged 42 µg/L, was 37

µg/L in 2008, and in 2010 was 39 µg/L. In 2011 phosphorus was lower (averaged 27 ug/L). Voluntary 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. In recent years the City of East Bethel has begun the process of installing municipal sewer and water in their Highway 65 district. An eventual extension of that system to Coon Lake has been discussed but there is no assurance this will happen. That might be most beneficial in the Hiawatha Beach and Interlachen 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 has 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, yet it continues to expand. CLP can cause a spike in phosphorus levels in early summer. CLID started treatment of CLP in 2009. In 2010 the East Bay was accepted into a five year pilot program for treatment of CLP.

2011 Coon Lake East Bay Water Quality Data

Coon Lake East Bay 2011		Date	5/16/2011	6/13/2011	7/12/2011	8/8/2011	9/6/2011			
		Time	13:40	13:30	14:45	14:55	13:00			
	Units	R.L.*	Results	Results	Results	Results	Results	Average	Min	Max
pH		0.1	8.49	8.370	8.440	8.550	8.330	8.436	8.330	8.550
Conductivity	mS/cm	0.0	0.205	0	0	0	0	0	0	0
Turbidity	FNRU	1.00	5	3.00	7.00	6.00	9.00	6.00	3.00	9.00
D.O.	mg/L	0.0		995%	839%	814%	735%	846%	735%	995%
D.O.	%	1.00		1.1	1.1	1.0	0.8	1.0	0.8	1.1
Temp.	°C	0.10	13.2	20.4	27.8	27.2	22.0	22.1	13.2	27.8
Temp.	°F	0.1	55.76	68.72	82.04	80.96	71.60	71.82	55.76	82.04
Salinity	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl-a	ug/L	1.0	13.6	3.5	8.7	9.6	12.8	9.6	3.5	13.6
T.P.	mg/L	0	0.031	0.030	0.026	0.024	0.026	0.027	0.024	0.031
T.P.	ug/L	5	31	30	26	24	26	27	24	31
Secchi	ft	0.1	7.3	8.2	6.6	6.2	4.8	6.6	4.8	8.2
Secchi	m	0.1	2.2	2.5	2.0	1.9	1.5	2.0	1.5	2.5
Physical			1.0	2.0	1.0	3.0	3.0	2.0	1.0	3.0
Recreational			1.0	2.0	2.0	2.0	3.0	2.0	1.0	3.0

*Reporting Limit

2010 Coon Lake West Bay Water Quality Data

Coon Lake West Bay 2010		Date	5/11/2010	5/25/2010	6/9/2010	6/22/2010	7/7/2010	7/20/2010	8/3/2010	8/17/2010	8/31/2010	9/14/2010			
		Time	14:30	11:15	10:40	10:10	12:35	10:50	10:40	10:25	11:00	10:45			
	Units	R.L.*	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Average	Min	Max
pH		0.1	7.64	8.38	7.67	8.28	8.14	7.75	7.89	7.68	7.57	7.90	7.89	7.57	8.38
Conductivity	mS/cm	0.01	0.202	0.191	0.169	0.160	0.152	0.155	0.169	0.162	0.169	0.167	0.17	0.15	0.20
Turbidity	FNRU	1.0	1	3	3	3	4	9	7	8	9	6	5.30	1.00	9.00
D.O.	mg/L	0.01	10.52	9.65	8.39	10.72	9.15	7.61	8.81	9.45	8.89	NA	9.24	7.61	10.72
D.O.	%	1.0	90%	108%	89%	118%	107%	85%	100%	97%	96%	NA	0.99	0.85	1.18
Temp.	°C	0.10	10.7	23.6	21.0	23.7	27.3	25.2	26.9	22.1	24.8	18.4	22.4	10.7	27.3
Temp.	°F	0.10	51.3	74.5	69.8	74.7	81.1	77.4	80.4	71.8	76.6	65.1	72.3	51.3	81.1
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	ug/L	1.0	2.2	1.5	4.6	5.7	3.9	3.8	7.5	1.5	9.3	4.0	4.40	1.50	9.30
T.P.	mg/L	0.005	0.016	0.019	0.028	0.027	0.019	0.027	0.029	0.031	0.033	0.026	0.03	0.02	0.033
T.P.	ug/L	5	16	19	28	27	19	27	29	31	33	26	25.50	16.00	33.0
Secchi	ft	0.1	>9.8	>9.6	6.3	>9.8	8.6	6.9	7.4	6.4	6.6	8.0	NA	6.30	>9.8
Secchi	m	0.1	>3.0	>2.9	1.9	>3.0	2.6	2.1	2.3	2.0	2.0	2.4	NA	1.92	>3.0
Physical			1	2	2	2	2	3	3	3	2	2	2.2	1	3
Recreational			1	2	2	2	2	2.5	3	3	2	2	2.2	1	3

*Reporting Limit

Stream Hydrology

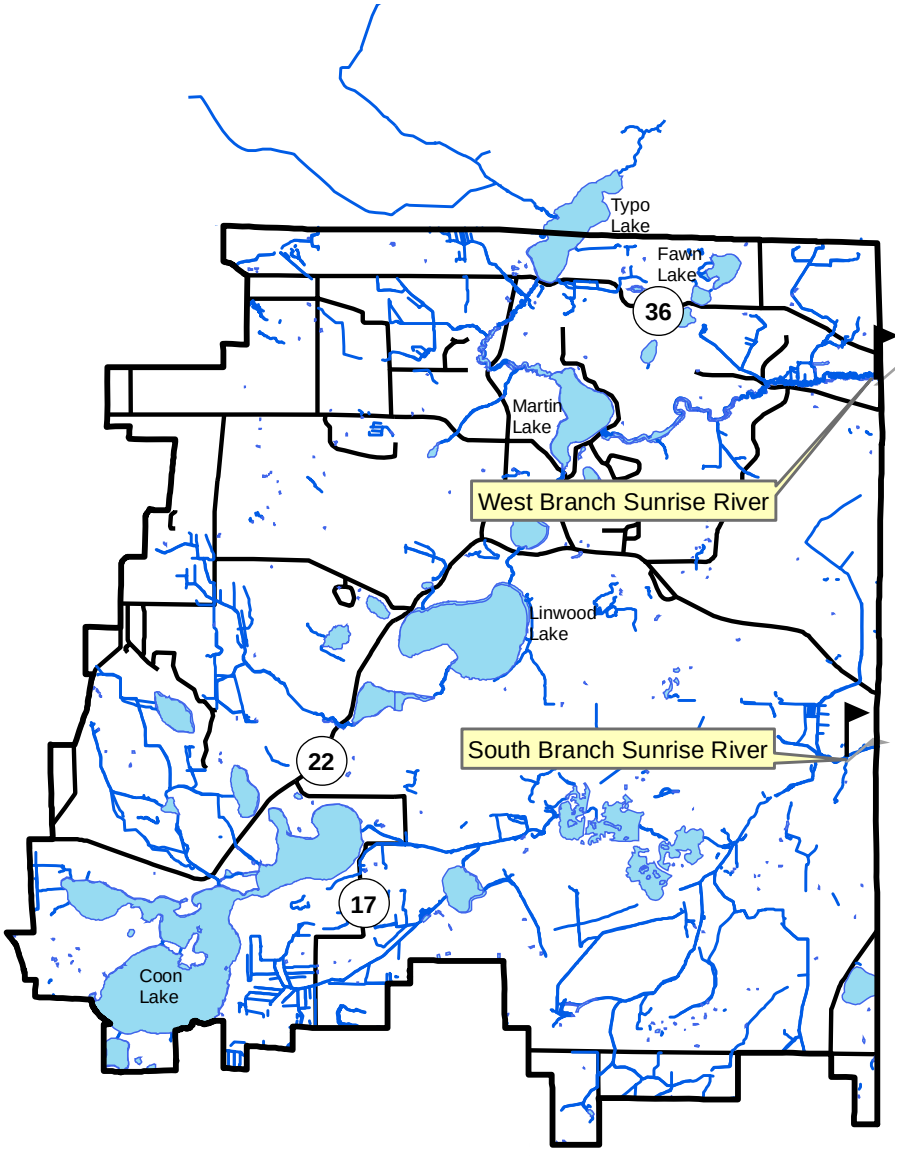
Description: Continuous water level monitoring in streams.

Purpose: To provide understanding of stream hydrology, including the impact of climate, land use or discharge changes. These data are also needed for calculation of pollutant loads and use of computer models for developing management strategies. In the Sunrise River Watershed, the monitoring sites are the outlets of the Sunrise River Watershed Management Organization's jurisdictional area, thereby allowing estimation of flows and pollutant loads leaving the jurisdiction.

Locations: South Branch Sunrise River at Hornsby St NE

West Branch Sunrise River at Co Rd 77

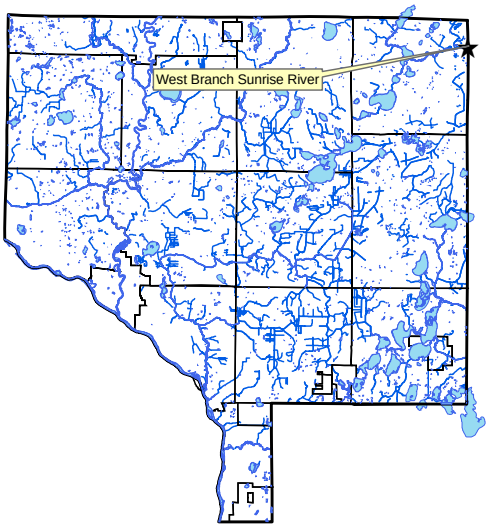
Sunrise Watershed Stream Hydrology Monitoring Sites



Stream Hydrology Monitoring

WEST BRANCH OF SUNRISE RIVER

At Co Rd 77, Linwood Township



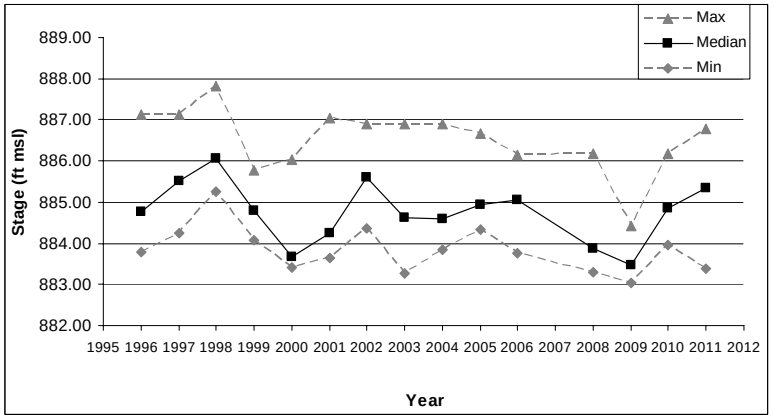
Notes

This monitoring site is the bottom of this watershed in Anoka County, at the Chisago County border. Upstream, this river drains through Linwood, Island, Martin, and Typo Lakes. The Sunrise River Watershed Management Organization monitors this site because it is at the bottom of their jurisdictional area. They have done water quality monitoring at this site and created a rating curve to estimate flow volumes from the water level measurements. In 2008 and 2009 this site was also monitored to collect data for a computer model of the entire Sunrise River watershed being done by the US Army Corps of Engineers, Chisago County, and other partners.

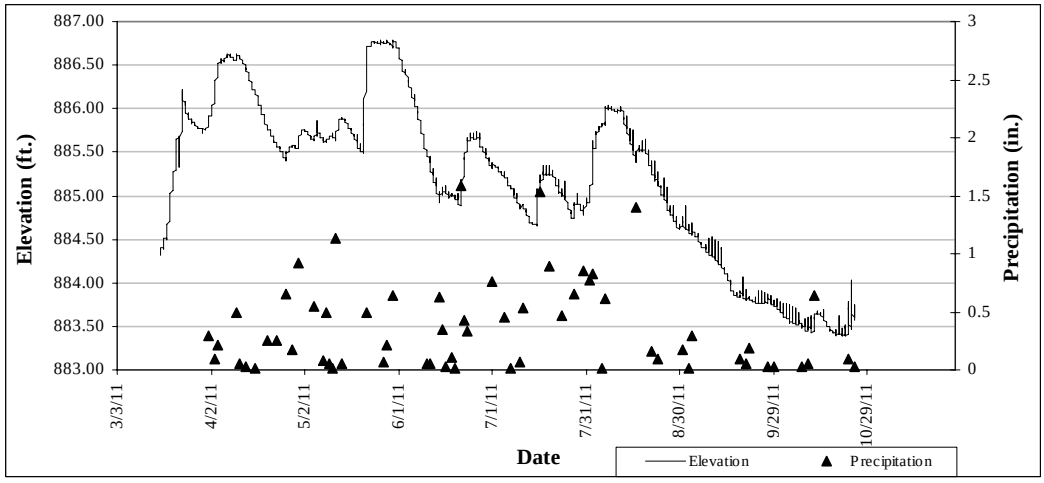
The rating curve to calculate flows (cfs) from stage data is:
Discharge (cfs) = $2.9171(\text{stage}-883.5)^3 - 7.9298(\text{stage}-883.5)^2 + 10.131(\text{stage}-883.5) + 10.18$ $R^2=0.94$

This rating curve was first prepared in 2002. Five additional flow-stage measurements were taken in 2008-09 to keep the equation updated.

Summary of All Monitored Years



2011 Hydrograph



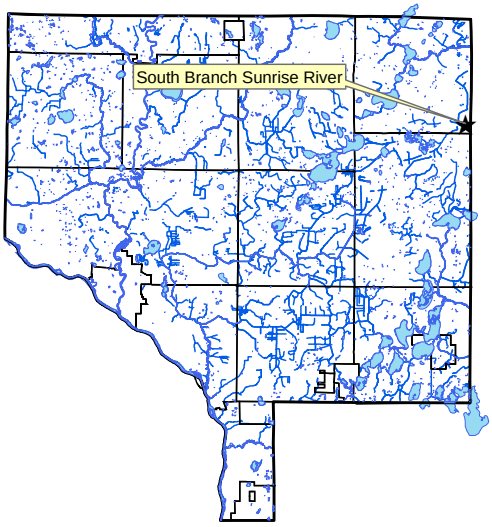
Stream Hydrology Monitoring

SOUTH BRANCH OF SUNRISE RIVER

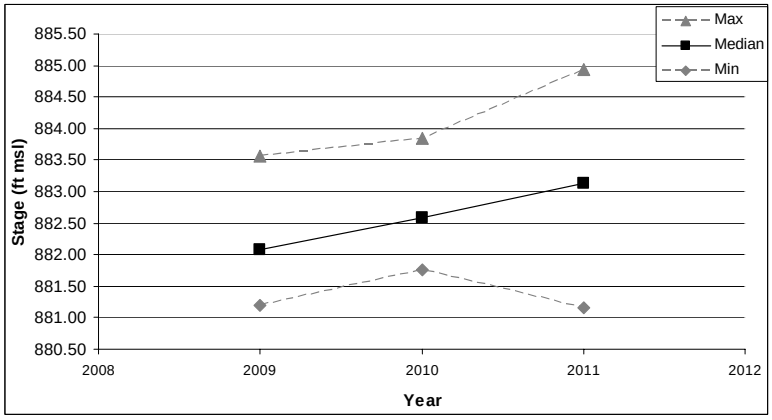
At Hornsby St, Linwood Township

Notes

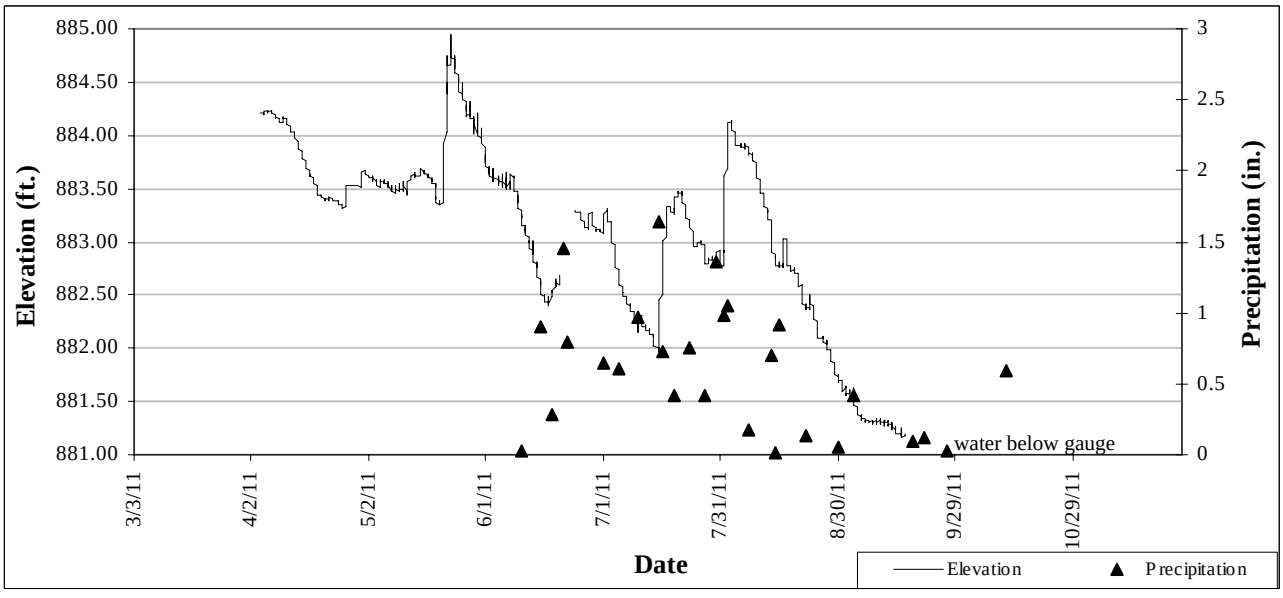
This monitoring site is the bottom of this watershed in Anoka County, at the closest accessible point to the Anoka-Chisago County boundary. Upstream, this river drains from Coon Lake and through the Carlos Avery Wildlife Management Area. The Sunrise River Watershed Management Organization monitors this site because it is at the bottom of their jurisdictional area. This site was first monitored in 2009 to collect data for a computer model of the entire Sunrise River watershed being done by the US Army Corps of Engineers, Chisago County, and other partners. Water quality monitoring has not yet occurred at this site, nor has a rating curve been created to estimate flow volumes from the water level measurements.



Summary of All Monitored Years



2011 Hydrograph



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.

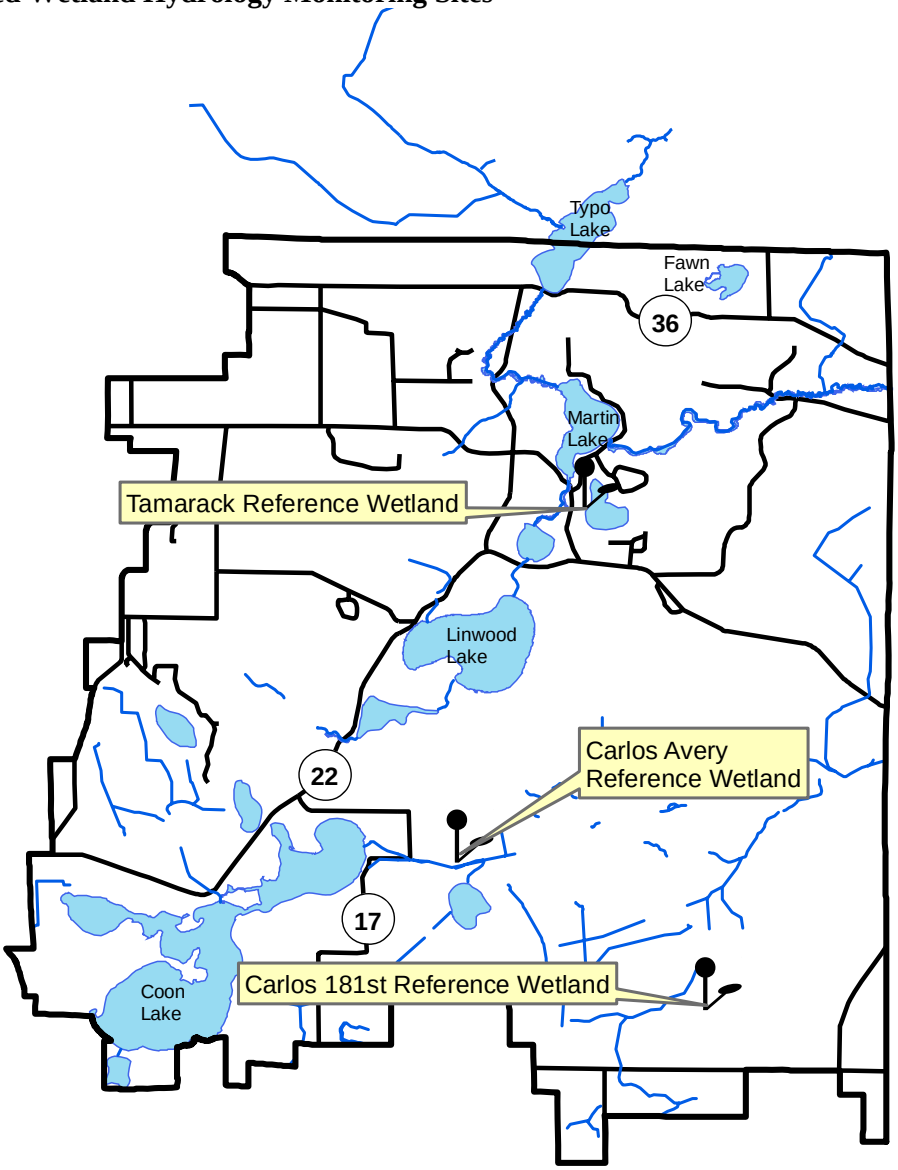
Locations: Carlos Avery Reference Wetland, Carlos Avery Wildlife Management Area, City of Columbus

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



CARLOS AVERY REFERENCE WETLAND

Carlos Avery Wildlife Management Area, City of Columbus

Site Information

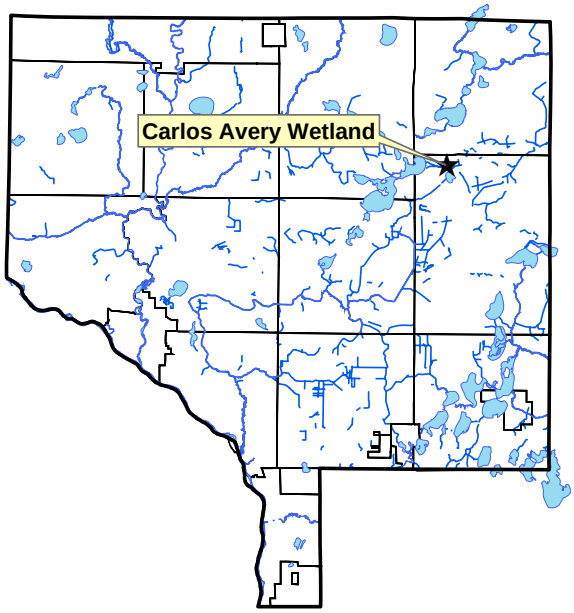
Monitored Since: 1997

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

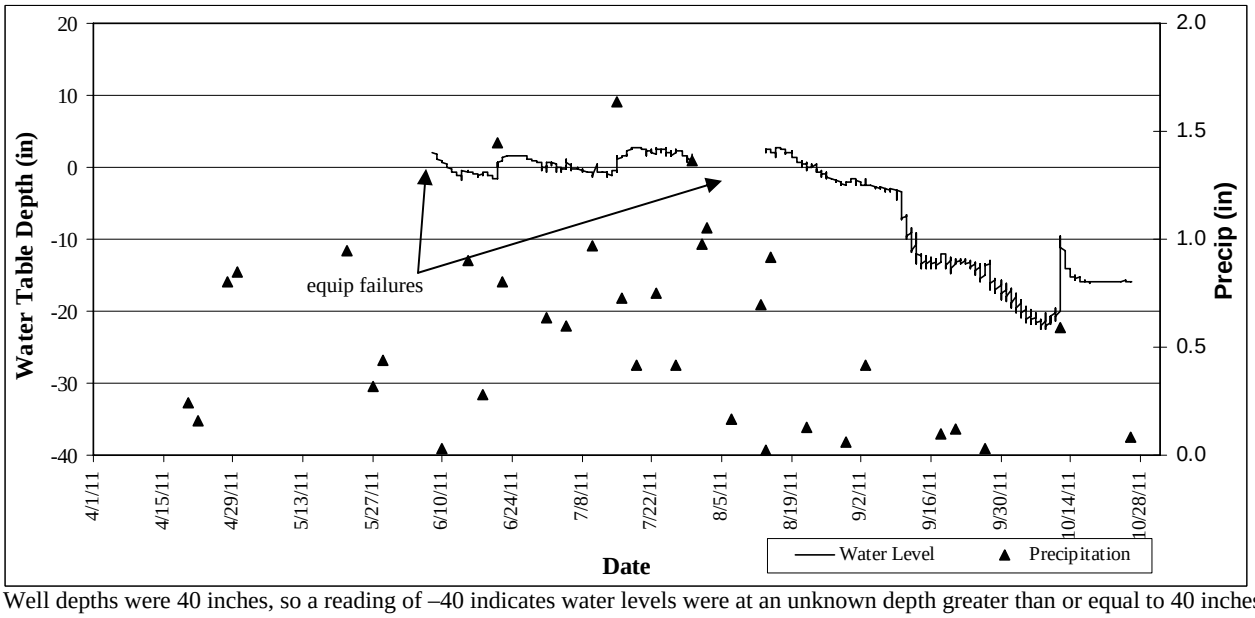
Surrounding Soils: Lino loamy fine sand

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.

2011 Hydrograph



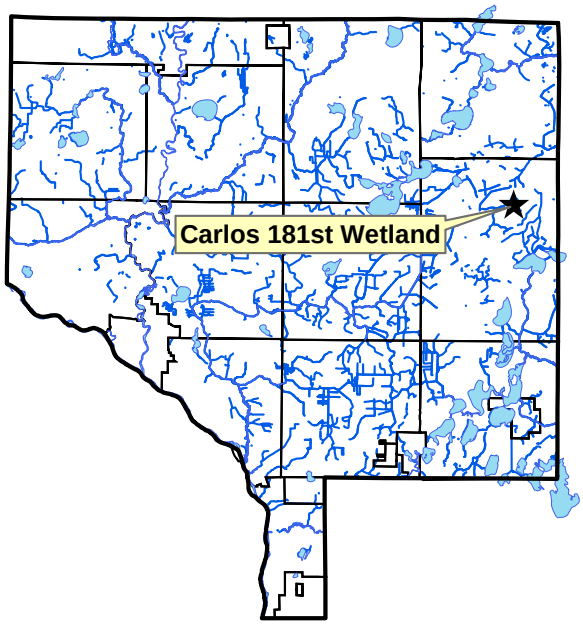
Well depths were 40 inches, so a reading of –40 indicates water levels were at an unknown depth greater than or equal to 40 inches.

Wetland Hydrology Monitoring

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	-

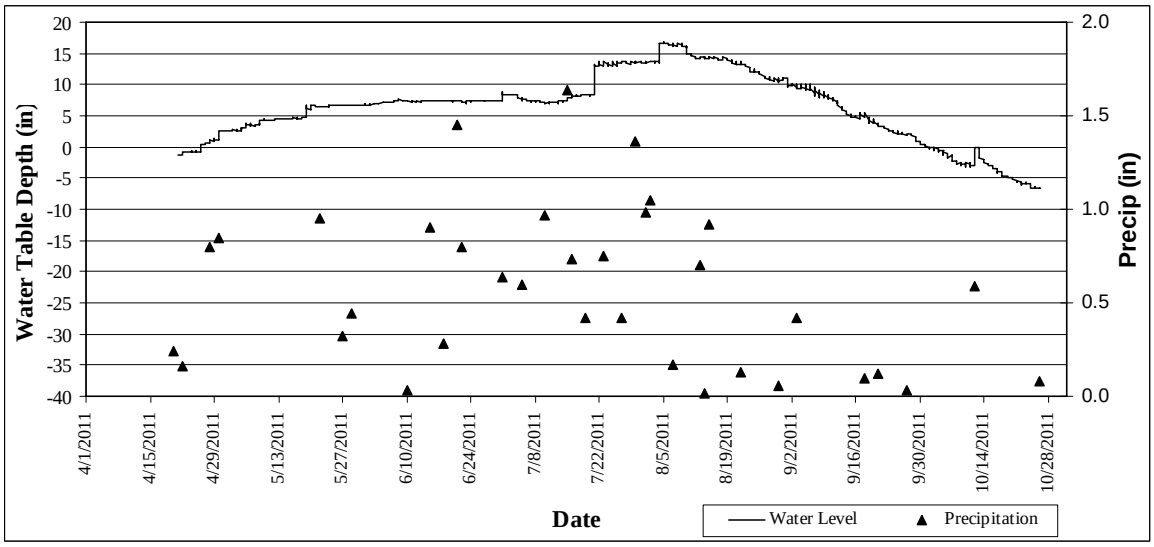
Surrounding Soils: Soderville fine sand

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.

2011 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

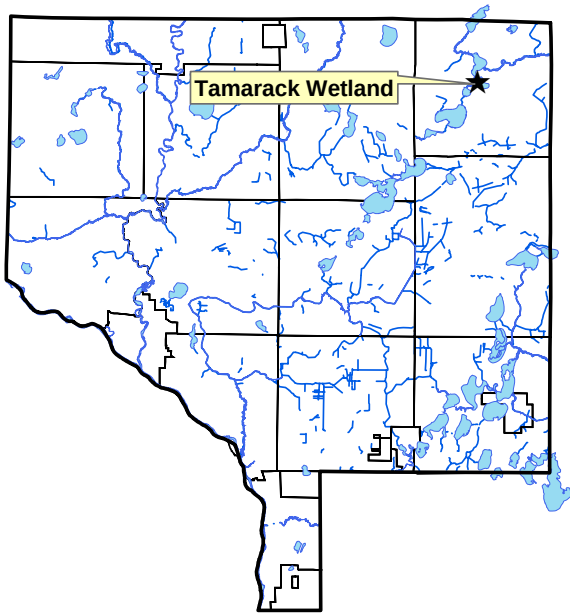
Monitored Since: 1999

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	-

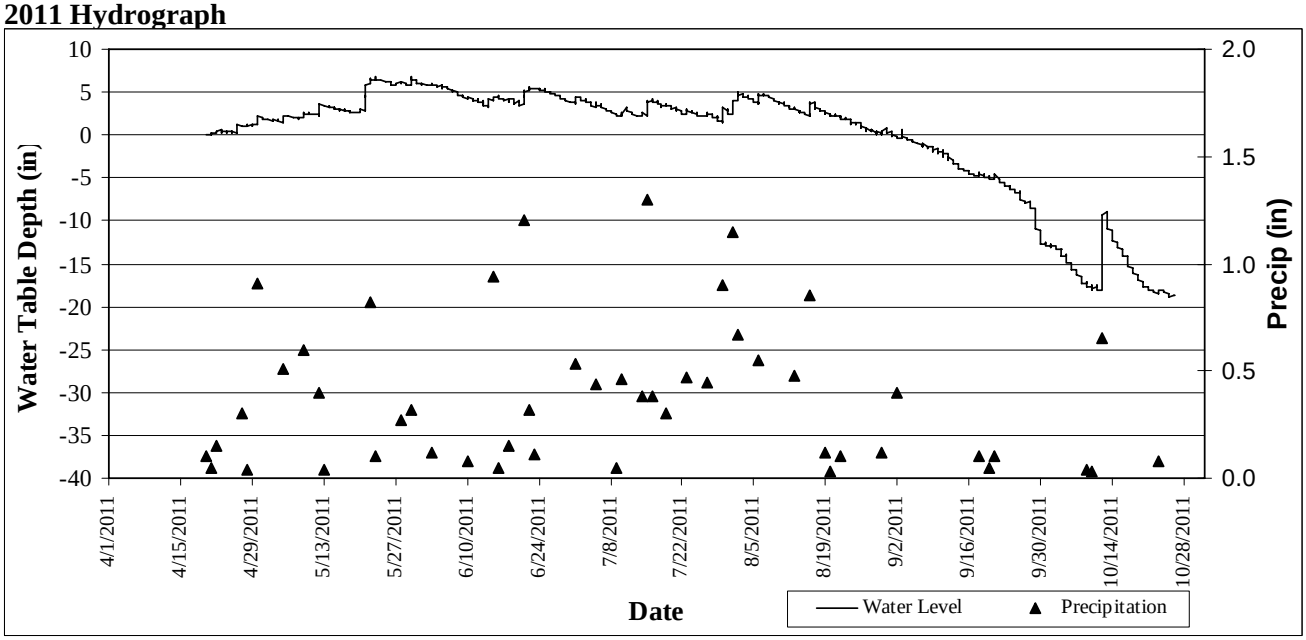
Surrounding Soils: Sartell fine sand

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.

2011 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.

SRWMO Phosphorus Export Estimation

Description: Three methods were used to estimate phosphorus export from the SRWMO jurisdictional area.

Purpose: The purpose of this analysis is to estimate phosphorus export from the Sunrise River WMO jurisdictional area, and thereby quantify the 20% phosphorus reduction goal the organization has set. For each water quality improvement project that is implemented in the SRWMO the phosphorus reduction achieved by that project can be estimated. In this way the SRWMO can track progress toward the 20% phosphorus reduction goal.

Locations: South Branch Sunrise River at Hornsby St NE

West Branch Sunrise River at Co Rd 77

Results: Anoka Conservation District staff compared three estimates of phosphorus export from the SRWMO to arrive at a single number. The three estimates are from FLUX, the Martin Lake TMDL, and the St. Croix River TMDL. FLUX, was done by the Anoka Conservation District for this project while the other two estimates were available from unrelated work by others and help to ensure accuracy. Each method of estimation has inherent strengths and weaknesses, and professional judgment exercised across all the three methods leads to a reasonable estimate.

FLUX Methodology

FLUX is a statistical model that combines continuous flow data with water quality grab samples to estimate continuous phosphorus discharge. This data exists for the West Branch of the Sunrise River at County Road 77. Neither continuous flow nor water quality data is available for the South Branch of the Sunrise River where it exits the SRWMO, so the analysis could not be performed for that area.

The FLUX analysis was done by a flow weighted concentration method. Data used was from 2001, 2003, and 2006, and included 685 days with continuous flow data and 24 water samples. The data were stratified by splitting the flows at the mean to reduce variation in the data. This stratification resulted in 8 samples greater than mean flows and 16 samples less than mean flows.

FLUX estimated a total loading of 4,068 lbs of phosphorus per year for the open water season. Because no sampling data is available from the winter season, the most conservative option is to apply open water season loading rates to winter months. This is conservative because winter loading is often much less than other seasons because there is little runoff. This approach results in an estimate of 2,431 lbs during the unmonitored winter season, or a year round total of 6,499 lbs. The actual total is likely somewhere between the open water estimate of 4,068 lbs and the year round estimate of 6,499 lbs.

It should be stressed that the FLUX estimate excludes the South Branch of the Sunrise River because the necessary data did not exist. The South Branch is a smaller and much less developed portion of the SRWMO, but nevertheless the FLUX estimate is an underestimate of total phosphorus export from the SRWMO.

Martin Lake TMDL Methods

The Martin Lake Total Maximum Daily Load Study estimated phosphorus loading to Martin Lake. The West Branch of the Sunrise River flows through Martin Lake. Martin Lake is 3 miles upstream of the SRWMO jurisdictional boundary, and the area between these points is lightly developed with no tributaries or other large, additional phosphorus sources. Therefore, the estimate of phosphorus loading to Martin Lake is informative

when considering export from the SRWMO. The TMDL was completed by the Minnesota Pollution Control Agency using the model BATHTUB in 2011.

Lake St. Croix TMDL

The Lake St. Croix TMDL was also completed by the Minnesota Pollution Control Agency. This TMDL partitioned the watershed. A phosphorus export for just the Anoka County portion of the St. Croix River Watershed, which happens to be the same as the SRMWO's jurisdicational area, is provided. This study found that Anoka Co parts of St. Croix watershed have loading of 4,931 lbs/yr and need to reduce it by 1,607 lbs/yr (32.6%) in order to meet St. Croix River water quality goals.

Comparison of Phosphorus Estimates

A comparison among the three methods, and their strengths and weaknesses, is provided in the table below. The FLUX and Lake St. Croix TMDL estimates are in general agreement, while the Martin Lake TMDL estimate is substantially higher an applies to an undesirably small geographic area. It would be inappropriate to simply use the FLUX estimate, because it applies to only the April-October portion of each year. The Lake St. Croix TMDL estimate (4,931 lbs) is 21% greater than the FLUX estimate for the open water season (4,068 lbs). It's reasonable to think that adding 21% to the FLUX estimate would account for winter loading and loading through the South Branch.

Therefore, we recommend that the SRWMO use 4,931 lbs/yr from the Lake St. Croix TMDL as the phosphorus export estimate for their jurisdictional area.

The SRWMO's goal of 20% phosphorus reduction = 986 lbs

Comparison of three phosphorus export estimation methods for the SRWMO.

Method	P export estimate	Description	Strengths	Weaknesses
Martin Lake TMDL study	**7,149 lbs/yr**	• Bathtub modeling for Martin Lake and upstream monitoring sites.	• Based on actual monitoring data in Martin Lake and upstream.	• Estimate is for the outlet of Martin Lake. Excludes the lower 3 miles of the river, though this largely undeveloped area. • Estimate excludes the S Branch of Sunrise River, though this mostly drains the undeveloped Carlos Avery Wildlife Mgmt Area.
Lake St. Croix TMDL study	**4,931 lbs/yr**	• Combination of land uses, each land use's literature values for phosphorus export, and monitoring data.	• Includes both the W and S Branches of the Sunrise River (none of the other methods do).	• Based mostly on literature values of phosphorus export from various land use types, less so on monitoring data from the site of interest.
FLUX	**4,068 lbs** for the open water season (April-Oct)	• Statistical analysis of continuous hydrology and water quality sample data.	• Estimate is calculated from water quality and hydrology data for the Sunrise River at Co Rd 77, our site of greatest interest, in 2001, 2003, and 2006.	• Estimate is for only April-Oct, excludes winter season. • Estimate excludes the S Branch of Sunrise River, though this mostly drains the undeveloped Carlos Avery Wildlife Mgmt Area.

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: None of the projects installed in 2011 used SRMWO cost share grants.

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
Fund Balance		**$8,178.17**

Water Quality Improvement Projects

Description: Projects on either public or private property that will improve water quality, such as repairing streambank erosion, restoring native shoreline vegetation, or rain gardens. These projects are partnerships between the landowner, the Anoka Conservation District, state agencies, lake associations, or others.

Purpose: To improve water quality in lakes streams and rivers by correcting erosion problems and providing buffers or other structures that filter runoff before it reaches the water bodies.

Results: Projects installed in 2011 in the SRWMO include:

- **Martin Lake rain gardens.** Three residential, curb-cut rain gardens were installed. These rain gardens intercept stormwater that was previously begin directed into the lake without any treatment. Collectively, these projects will reduce phosphorus entering Martin Lake by 1.8 lbs/yr and suspended solids by 596 lbs/year. These projects were the 3rd, 4th, and 5th most cost effective projects identified in the Stormwater Retrofit Assessment completed in August 2011.
  These projects were a collaboration between the SRWMO, Anoka Conservation District, landowners, Linwood Township, landowners, and the Minnesota Conservation Corps. Partial project dollars were provided by the Clean Water Fund (from the Clean Water, Land, and Legacy Amendment).
- **Coon Lake - East Front Blvd stormwater retrofit.** This project treats stormwater before it enters Coon Lake. The project involved installation of sediment capture devices in a drainageway. Before this project, stormwater runoff from a residential area entered the lake by this route without any treatment. This project was a collaboration between the Coon Lake Improvement Association, Mr. Doug Tierney, and the City of East Bethel.
- **Braido – native plant gardens.** The Braido ecological restoration project focused on restoring the ecological integrity of a 5.1 acre residential property. Practices implemented include the installation of a rain garden, native prairie plantings, and removal of invasive woodland species. The benefits associated with this ecological restoration include water quality improvement and increased biodiversity from the native prairie plantings. The restoration of the woodland community consisted of removing invasive species and replacing them with native species that will provide food and habitat for wildlife.

Projects anticipated soon in the SRWMO include:

- **Carp barriers at Martin and Typo Lakes**. In 2012 and 2013 carp barriers will be installed at four sites around Martin and Typo Lakes. Additionally, commercial carp harvests will be conducted with the aid of radio tracking the schooling fish in wintertime. This project aims to improve water quality in these lakes by reducing the carp population.

  Carp are a high percentage of the fish biomass in these waterbodies. They strongly degrade habitat and water quality throughout their feeding and spawning behaviors. Carp control will improve water clarity, increase plants, improve the game fishery, and enhance wildlife opportunities. 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 is shallow and good for spawning. Stopping migrations between the lakes will reduce overwintering survival and spawning success. The barriers alone will achieve this over time, but we will accelerate results with carp harvests.

This project is a collaboration between the SRWMO, Anoka Conservation District, Martin Lakers Association, MN DNR, and Linwood Township. Major funding is provided by the SRWMO, Martin Lakers Association, and the Outdoor Heritage Fund (from the Clean Water, Land, and Legacy Amendment).

- **Martin Lake Stormwater Retrofits –** In 2012 the SRWMO and Anoka Conservation District will install other stormwater retrofits identified as cost effective in the 2011 Martin Lake Stormwater Assessment.
- **Coon Lake Stormwater Retrofit** - In 2012-13 a stormwater assessment will be conducted to identify and rank the most cost effective stormwater retrofits that will benefit Coon Lake water quality. In 2014-15 the SRWMO plans funding to install the best of these projects.

Martin Lake Stormwater Retrofits

Description: The stormwater retrofits are projects that treat stormwater runoff before it reaches Martin Lake, thereby reducing phosphorus and other pollutants in the lake. In early 2011 a Stormwater Assessment was completed for Martin Lake. That study identified 15 stormwater retrofits and ranked them by cost effectiveness (amount of pollution reduced per dollar spent). Later in 2011, installation of cost effective projects began. These were three residential curb-cut rain gardens.

Purpose: To improve Martin Lake water quality.

Results: In fall 2011 three residential, curb-cut rain gardens were installed in the yards of willing homeowners. All of these rain gardens were located at the end of a long run of curb, and just up-gradient of a catch basin that would direct the water into the lake. A cut in the curb was created, directing the water into the excavated rain garden basin. In the rain garden, storm water soaks into the ground through the engineered soils. Standing water is present for no more than 48 hours after storms, and often much less. If the garden fills to the curb elevation during heavy rains, water will simply pass by the rain garden and go to the catch basin.

These projects were the 3rd, 4th, and 5th most cost effective projects identified in the Stormwater Retrofit Assessment completed earlier in 2011. They will prevent an estimated 1.8 pounds of phosphorus from entering Martin Lake each year, as well as 596 pounds of solids. Phosphorus is the nutrient that fuels algae blooms that are a common problem in Martin Lake. This project and others like it are important steps toward helping Martin Lake meet state water quality standards.

These projects were a collaboration between the SRWMO, Anoka Conservation District, landowners, Linwood Township, and the Minnesota Conservation Corps. Partial project dollars were provided by the Clean Water Fund (from the Clean Water, Land and Legacy Amendment).

Project financial summary:

Funding sources:

$15,127	Clean Water Fund (LRP)
$5,500	MCC grant for labor
$7,000	SRWMO
$27,627	Total cost including ACD project promo and mgmt

The SRWMO committed $10,000 to this project. The funds were used as follows:

$3,037.57	Installation
$3,962.43	ACD reimbursement for promotion, administration, and construction oversight.
$3,000	Funds returned to the SRWMO
$10,000	Total

The Anoka Conservation District contributed an additional $3,457.57 of in-kind efforts to this project which included project promotion, administration, and construction oversight.

Project promotion, administration, and construction oversight tasks included:

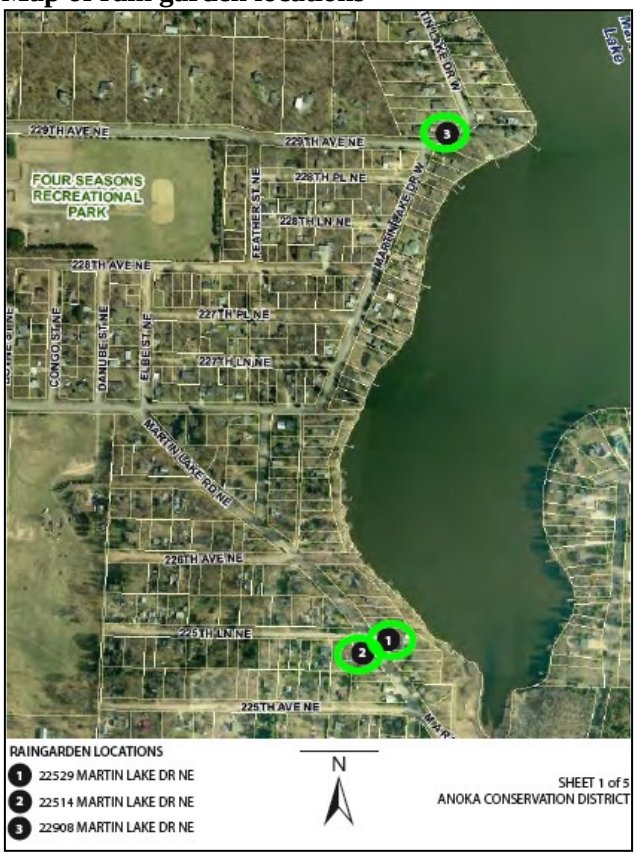
Promotion

-Contact high priority property owners via mailing
-Follow-up with visit to property
-Provide informational meeting for interested property owners
-Coordinate signature of intent forms

Rain Garden Installation

-Develop base maps prior to design work
-Develop online survey for property owners to provide input on design
-Coordinate design process
-Conduct bid process for installation contractor
-Develop and coordinate contracts between contractors and property owners
-Coordinate installation process between contractor and Minnesota Conservation Corps crew
-Construction oversight throughout project
-Verification of proper project installation through on-site surveys and measurements

Map of rain garden locations



22514 Martin Lake Dr.

22529 Martin Lake Dr.

22908 Martin Lake Dr.

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 is doing regular education and marketing of lakeshore restorations to homeowners.

Purpose: To improve lake water quality and lake health.

Results: In 2011 the SRWMO contracted the Anoka Conservation District (ACD) to accomplish four lakeshore landscaping education tasks, including:

Join Blue Thumb – 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 2012.

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. In 2011 the SRWMO exceeded the 30 hour commitment with the following work:

- Membership administration
- Presentation at Linwood Lake Association annual meeting
- Braido native plant gardens
- Mailing to Fawn Lake residents including lakeshore landscaping mailing
- Placing a link to the Blue Thumb website on the SRWMO website
- Promoting, organizing, and installing the Martin Lake rain gardens.

Blue Thumb Link on SRWMO Website – The ACD added a link to the Blue Thumb website on the SRWMO website. On the Blue Thumb website residents can access a variety of tools including how-to manuals and a plant selection tool.

30-second Web Video – The SRWMO requested that the ACD create a short web video that would promote lakeshore restorations and also serve to improve awareness of the SRWMO. The work includes creating a script, securing video clips and photos, producing the video including audio, and posting it to the SRWMO website.

The two minute video was completed and posted to the SRWMO website in March 2012.

Brochure distribution at Fawn Lake - The SRWMO wished to make a special effort to promote lakeshore restorations at Fawn Lake. This lake's watershed is not much larger than the homes encircling the lake. Therefore, water quality in the lake largely hinges on these homeowners activities. Presently, Fawn Lake has the best water quality of all Anoka County Lakes.

A full-color, 11x17, tri-folded brochure about lakeshore restorations was delivered to all 66 homes on Fawn Lake. The brochure included many photos highlighting the attractiveness of these restorations, as well as how they help address some challenges of landscaping near the lake. It described methods, and technical and financial assistance available. The brochure was accompanied by a letter. Linwood Township staff handled distribution of the addressed envelopes. No phone or email responses to this mailing were received.

Aquatic Plant Education Campaign

Description: Mailings, workshops, signage, and articles to educate lakeshore homeowners about the benefits of native aquatic plants, threat of invasive species, and ecologically-sound and legal lakeshore management. Target neighborhoods are those surrounding Coon, Fawn, Linwood, and Martin Lakes.

Purpose: To educate lakeshore homeowners about the benefits of native aquatic plants, threat of invasive species, and ecologically-sound and legal lakeshore management.

Results: In 2011 the SRWMO contracted with the ACD to replace vandalized SRWMO signage at the Martin Lake boat landing. That signage asks boaters to take measures that prevent that spread of aquatic invasive species. This signage is designed to be a local voice that reinforces messages in DNR signage on this topic. These signs had been installed on the five major recreational lakes in 2007. While the signs at other locations are in good condition, the sign at Martin Lake was destroyed by vandals. The ACD replaced the sign at Martin Lake with another Aluminum sign.

New SRWMO Sign at the Martin Lake Public Boat Landing

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.

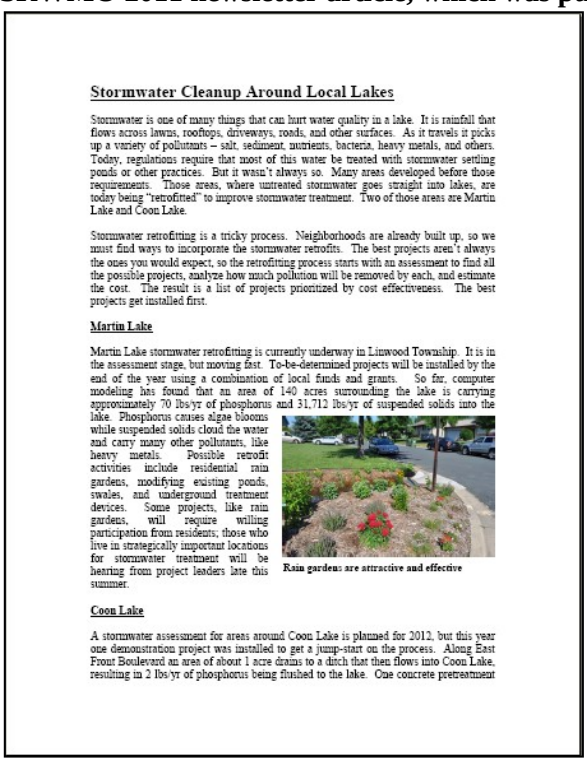
Purpose: To improve citizen awareness of the SRWMO, its programs, and accomplishments.

Results: In 2011 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 educational efforts were discussed at the February 24, 2011 SRWMO meeting. The article shall be written to cover the following:

- Recent and upcoming efforts to treat stormwater drainage to area lakes (i.e. stormwater retrofitting). These efforts include the Martin Lake stormwater assessment and upcoming projects, Coon Lake stormwater assessment, and East Front Blvd project.
- Ask residents to report any stormwater outfalls into area waterbodies that concern them, especially around Martin or Coon Lakes where assessments are ongoing or planned.
- Good housekeeping practices people can use in their yards to keep stormwater cleaner.
- SRWMO website address and other SRWMO organizational info.

The Anoka Conservation District drafted the newsletter article. It was provided to the SRWMO Board for review before distribution to the member communities. This was accomplished before the end of July so the cities will have ample time to run it in their newsletters sometime during the remainder of the year.

SRWMO 2011 newsletter article, which was published in member city newsletters



Stormwater Cleanup Around Local Lakes

Stormwater is one of many things that can hurt water quality in a lake. It is rainfall that flows across lawns, rooftops, driveways, roads, and other surfaces. As it travels it picks up a variety of pollutants – salt, sediment, nutrients, bacteria, heavy metals, and others. Today, regulations require that most of this water be treated with stormwater settling ponds or other practices. But it wasn't always so. Many areas developed before those requirements. Those areas, where untreated stormwater goes straight into lakes, are today being "retrofitted" to improve stormwater treatment. Two of those areas are Martin Lake and Coon Lake.

Stormwater retrofitting is a tricky process. Neighborhoods are already built up, so we must find ways to incorporate the stormwater retrofits. The best projects aren't always the ones you would expect, so the retrofitting process starts with an assessment to find all the possible projects, analyze how much pollution will be removed by each, and estimate the cost. The result is a list of projects prioritized by cost effectiveness. The best projects get installed first.

Martin Lake

Martin Lake stormwater retrofitting is currently underway in Linwood Township. It is in the assessment stage, but moving fast. To-be-determined projects will be installed by the end of the year using a combination of local funds and grants. So far, computer modeling has found that an area of 140 acres surrounding the lake is carrying approximately 70 lbs/yr of phosphorus and 31,712 lbs/yr of suspended solids into the lake. Phosphorus causes algae blooms while suspended solids cloud the water and carry many other pollutants, like heavy metals. Possible retrofit activities include residential rain gardens, modifying existing ponds, swales, and underground treatment devices. Some projects, like rain gardens, will require willing participation from residents; those who live in strategically important locations for stormwater treatment will be hearing from project leaders late this summer.

Rain gardens are attractive and effective

Coon Lake

A stormwater assessment for areas around Coon Lake is planned for 2012, but this year one demonstration project was installed to get a jump-start on the process. Along East Front Boulevard an area of about 1 acre drains to a ditch that then flows into Coon Lake, resulting in 2 lbs/yr of phosphorus being flushed to the lake. One concrete pretreatment structure was placed at the ditch inlet, and two concrete weirs were placed at culverts. Together, these capture sediment, street grime, and other pollutants, reducing phosphorus entering Coon Lake by 1.34 lbs/yr. Considering 1 lb of phosphorus can produce 500 lbs of algae, this one project may reduce algal growth in Coon Lake by 670 lbs/yr!

Help Make a Difference

Anyone who lives near a stormwater drain has waterfront property, at least in a sense. These curbside gutters drain to lakes, streams, and wetlands. Let's keep it clean. If you do live directly next to water, don't mow the yard to the water's edge. Instead, leave a strip of plants to catch pollutants and provide habitat.

Project Leaders

Stormwater retrofitting on these lakes is led by the Sunrise River Watershed Management Organization (SRWMO) with assistance from partners including the Anoka Conservation District, City of East Bethel, Linwood Township, Martin Lakers Association, and the Coon Lake Improvement Association.

Sunrise River WMO Contact Information and Meetings

Information about the SRWMO may be found on the website at http://www.anokanaturalresources.com/srwmo. The remaining 2011 SRWMO meetings are on August 4th and November 3rd; meetings are held at 6pm at East Bethel City Hall.

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. The website has been in operation since 2003.

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.AnokaNaturalResources.com/SRWMO

Results: 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.

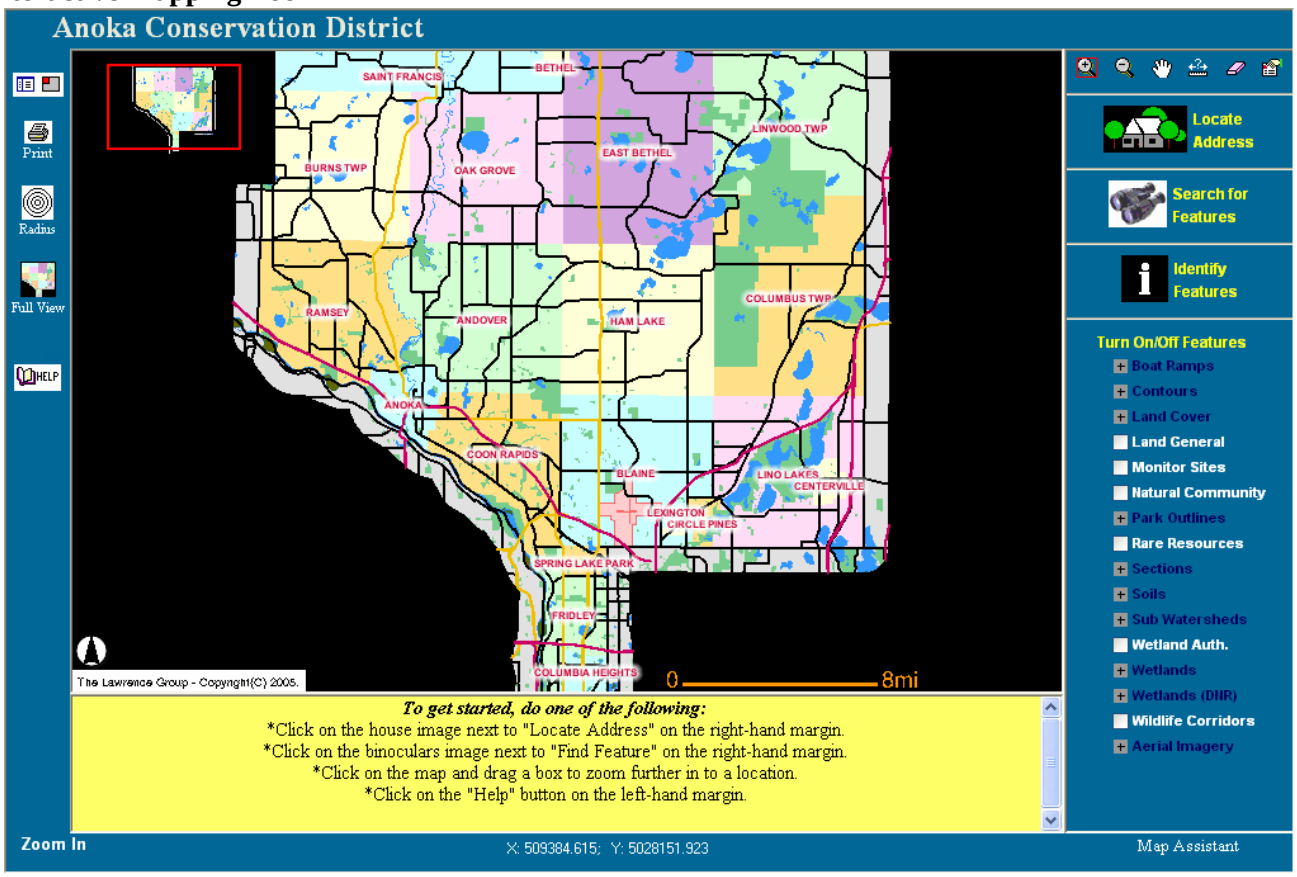
Other tools on the website include:

- 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

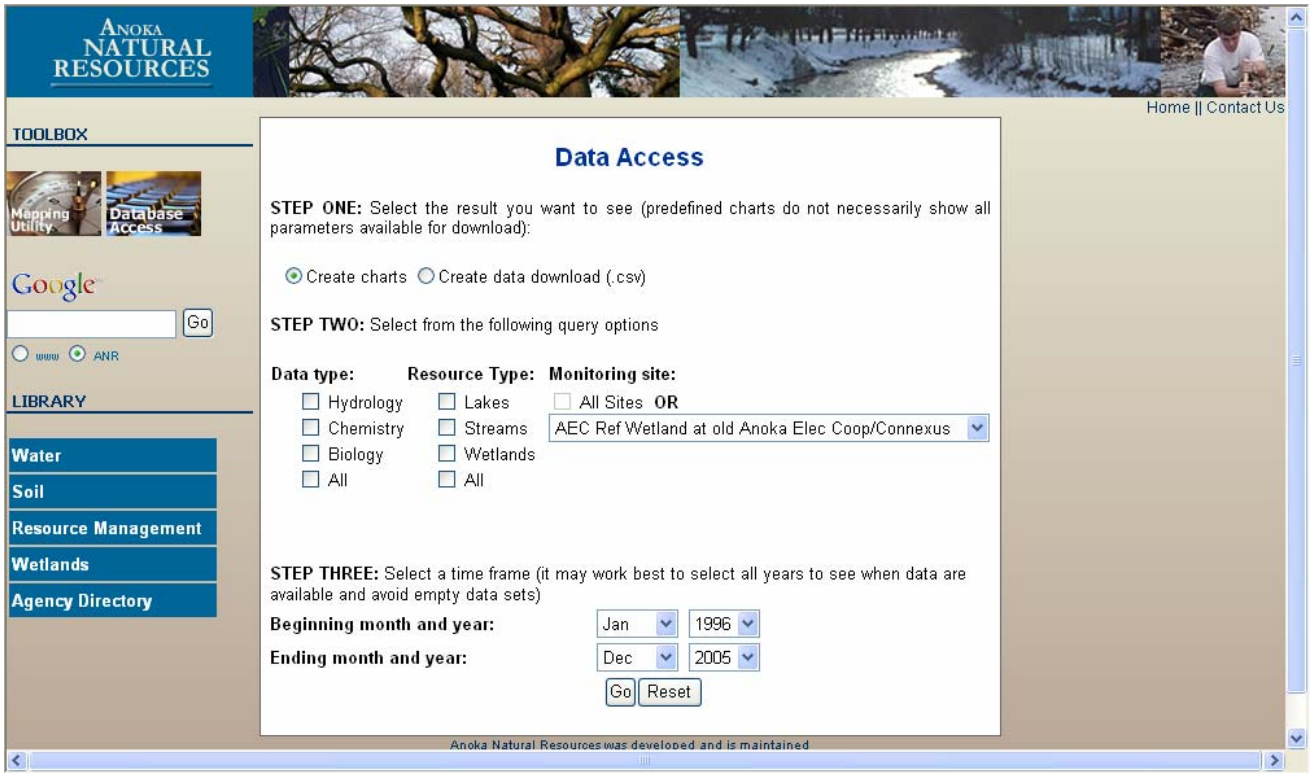
SRMWO Website Homepage

more on next page

Interactive Mapping Tool



Interactive Data Access Tool



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: In 2011 two grant applications were prepared for the Martin and Typo Lake Carp barriers, and one was funded. Fees paid to the ACD only covered preparation of only one of these grant applications. Because the carp barriers project is a partnership between the SRWMO and ACD, the ACD bore the cost of preparing the second application.

The grant awarded was from the DNR Conservation Partners Legacy Program which obtains its funding from the Outdoor Heritage Fund (from the Clean Water, Land, and Legacy Amendment). The grant award of $129,938 is sufficient to fund carp barrier at four locations around Martin and Typo Lakes, as well as perform a commercial harvest of carp aided by radio tagging the fish. The 15% required local match for the project is from the SRWMO ($35,000 in 2012-13) and Martin Lakers Association ($5,000 in 2012). Project installation will begin in 2012.

The second grant application was also for the carp barriers project. The application was to the Clean Water Fund from the Board of Water and Soil Resources (BWSR). This application was not awarded, perhaps because the project was already being funded by the DNR grant.

The SRWMO requested that the ACD be the applicant for the DNR grant. This was due to questions about whether the SRWMO's lack of a recent financial audit would make it ineligible for the grant. State rules regarding financial audits for WMO's are currently being changed, and the SRMWO is working with the BWSR to ensure they are meeting requirements.

SRWMO 2010 Annual Report to BWSR

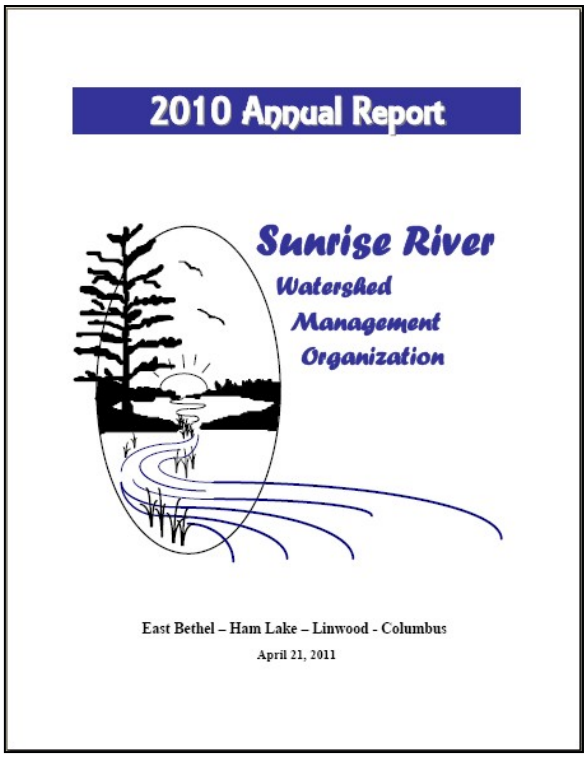
Description: The Sunrise River Watershed Management Organization (SRWMO) is required by law to submit an annual report to the Minnesota Board of Water and Soil Resources (BWSR), the state agency with oversight authorities. This report consists of an up-to-date listing of SRWMO Board members, activities 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).

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 2010 Sunrise River WMO Annual Report. ACD drafted the report and a cover letter. The draft was provided to the SRWMO Board on April 14, 2011. After SRWMO Board review, a final draft was delivered to the Chair on April 21, 2010 for his signature and forwarded to BWSR. On April 22, 2010 a sufficient number 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. A copy was also provided to each SRWMO Board member. The report is available to the public on the SRWMO website.

Cover



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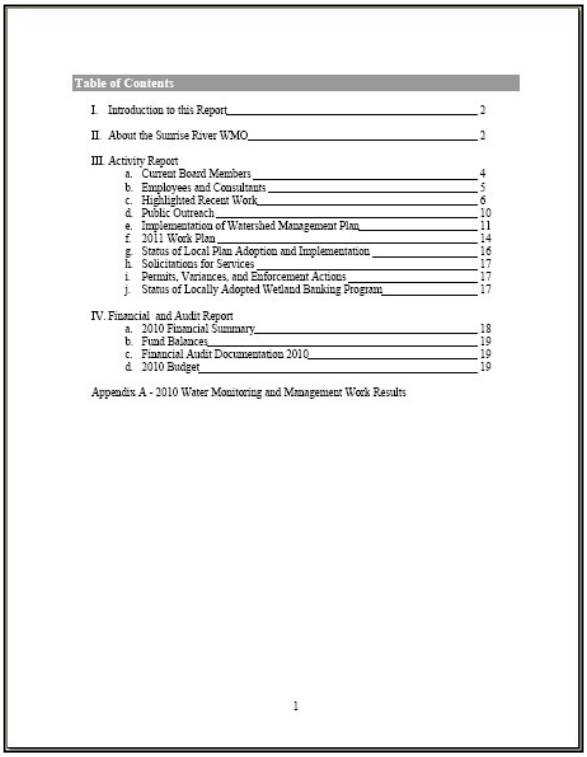
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Review Local Water Plans

Description: SRWMO member municipalities must update their Local Water Management Plans and ordinances within 2 years of the adoption of the new SRWMO Plan (MN Rules 8410.0130 and 84100160). All must be consistent with the SRWMO Plan. The SRWMO has approval authority over the Local Water Management Plans. Once a community submits their updated Local Water Management Plan to the WMO for review, the WMO has 60 days to provide comments. The Metropolitan Council has a simultaneous 45-day review period, and the WMO's review of the Plan must include a review of Metropolitan Council's comments. ACD assists the SRWMO by providing a technical review of Local Water Management Plans, as they are completed, and Metropolitan Council's comments on each.

ACD's assistance includes:

- Reviewing each of the four member municipalities' draft local water management plan, and any relevant ordinances, for consistency with the SRWMO Plan.
- Writing comments in the form of a letter to the municipality and presenting it to the SRWMO Board.
- Sending the comments to the municipality when authorized by the SRWMO Board.
- Do all of the above within the 60 day comment period allowed by law.

Purpose: To ensure consistency between municipal local water plans and the SRWMO Watershed Management Plan.

Results: All local water plans, except Ham Lake, have been approved. The following is the status of each city or township's local water plan, as of January 23, 2012:

Linwood Township – Linwood Township has adopted the SRWMO Watershed Management Plan by reference.

Ham Lake – The Ham Lake Local Water Plan was reviewed in January 2012. The staff recommendation is for approval, contingent upon inclusion of the SRWMO wetland standards. The SRMWO will take action at their Feb. 2, 2012 meeting.

East Bethel – The SRWMO received a draft local water plan in June 2010. Changes were requested. In May 2011 a final draft was received and approved.

Columbus – Approved at the February 2011 SRWMO meeting.

Deadline for all – June 3, 2012 is the deadline for all SRWMO cities and townships to revise local water plans and ordinances to be consistent with the SRWMO 3rd Generation Watershed Management Plan.

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 2011 a total of 43 hours of administrative assistance were performed. This was beyond the 22 hours that were pre-paid under contract because of unanticipated, non-routine tasks such as two rounds of amendments to the Watershed Management Plan, updates to the joint powers agreement, changes to insurance, creating a display or a local event, and others. Those hours in excess of 22 were charged at an hourly rate of $70 after approval by the SRWMO Board.

The following tasks were accomplished:

- Two rounds of watershed plan amendments.
- Edited the SRWMO joint powers agreement, and facilitated approvals and distribution.
- Coordinating financial arrangement changes East Bethel Finance Director.
- Coordinated annual reporting.
- Responded to 11 separate email inquiries/questions from Board members. This excludes simple emails and phone calls that took only moments to address.
- Appealed an MPCA decision that SRWMO carp barriers are ineligible for section 319 grant funding.
- Signed up the SRWMO for Blue Thumb reported in-kind contributions.
- Communications with BWSR and the Treasurer regarding SRWMO delinquent financial audits and audit requirements, and grant eligibility.
- Met with the SRWMO Treasurer, as requested, to discuss financial audit requirements.
- Reminders to some communities, at the SRWMO Board's direction, regarding delinquent local water plans and annual reports to the SRWMO.
- Reviewed draft minutes from one meeting. Due to the complex nature of some conversations, the recording secretary requested a technical review of the draft minutes.
- Portions of SRWMO meeting time that were dedicated to advising the board on administrative topics, including budgeting, JPA revisions, watershed plan revisions, soliciting bids for services, and financial arrangements.
- Recorded February 2011 meeting minutes when the recording secretary was absent.
- Phone calls from residents or developers. Most commonly, phone calls are from construction firms inquiring about permit requirements.
- Assembled meeting packets and recommended agenda items to the recording secretary.
- Assisted the Treasurer with insurance company questions and obtaining a quote.
- Assembled a display about the SRWMO and lakeshore landscaping for the SRWMO Board to use at Linwood Family Fun Day.
- Prepared materials for meetings (not including materials relating to tasks that were paid separately by the SRWMO).
- Communications related to returning $3,000 of SRWMO funding that was not needed for the Martin Lake rain gardens project.

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	WMO Asst	WMO Websites	Reference Wetland	Lake Level	Stream Level	Lake WQ	Martin Typo Lake TMDL	Martin Lake Fish Barriers	SRWMO Admin	SRWMO Grant Search	SRWMO P Export	WMO Videos	Lcoal Water Plan reviews	WMO annual rpt	Martin Lk Retro Assess	Martin Lake Retro Promo	Martin Lake Retro Install	Total
Revenues																		
SRWMO	140	770	1620	800	1090	400			2270	1000	1200	1363	1000	675	5000		7000	24328
State																	15127	15127
Anoka Conservation District	2260		9	140	585	1253	776	7639	795	427		908		51	8005	1829	1629	26306
County Ag Preserves																		
Regional/Local																	5640	5640
Other Service Fees																		
Local Water Planning																		
TOTAL	2400	770	1629	940	1675	1653	776	7639	3065	1427	1200	2271	1000	726	13005	1829	29396	71401
Expenses																		
Capital Outlay/Equip	6	2	4	1	9	2	3	12	7				4					50
Personnel Salaries/Benefits	2052	409	1418	822	1412	1076	662	6653	2676	1254	966	2049	286	628	11341	1609	8061	43376
Overhead	175	36	109	61	128	494	62	515	205	76	49	113	36	56	848	95	263	3323
Employee Training	7	2	8	5	7	3	1	23	13	3	11	19	1	1	21	4	46	176
Vehicle/Mileage	38	6	22	14	20	22	13	131	46	30	11	28	3	14	260	39	70	766
Rent	96	19	58	31	68	51	34	305	117	64	25	62	17	28	534	83	157	1748
Program Participants																		
Program Supplies	25		9	6	30	5											20798	20873
Equipment Maintenance																		
TOTAL	2400	475	1629	940	1675	1653	776	7639	3065	1427	1062	2271	347	726	13005	1829	29395	70312

Recommendations

- **Follow the guidance of the SRWMO's 10-year watershed management plan,** which as updated in February 2010.
- **Integrate theTypo and Martin Lake Total Maximum Daily Load (TMDL) Study and Implementation Plan into SRWMO efforts.** These reports are being completed by the MN Pollution Control Agency in 2012.
- **Actively follow development of St. Croix River and Sunrise River TMDLs**, and become involved as appropriate. The St. Croix TMDL is being completed in early 2012. The Sunrise River TMDL is began 2011 and will take several years.
- **Install rough fish barriers round Typo Lake and Martin Lake, and track response of the lakes.** Carp barriers will be installed around Martin and Typo Lakes in 2012-2013. Tracking the lakes' water quality and fishery response to these should be a priority.
- **Install high priority stormwater retrofits around Coon and Martin Lakes.** A stormwater assessment is complete for Martin Lake and will begin in 2012 for Coon Lake. They identify and rank stormwater retrofit projects that will benefit lake water quality. Installation should be a priority.
- **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. New efforts or incentives are planned for 2013, and new approaches should be welcomed.
- **Increase the use of web videos as an effective education and reporting tool.** Web videos are increasingly easy to do. They convey a lot of information quickly by combining visual and audio messages. They can be effective for public education, but also for highlighting successful projects or reporting.
- **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.