

Bassett Creek Watershed Management Commission



2017 Annual Report

Crystal • Golden Valley • Medicine Lake • Minneapolis
Minnetonka • New Hope • Plymouth • Robbinsdale • St. Louis Park



May 2018

Bassett Creek Watershed Management Commission

2017 Annual Report

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Cover photo: Wirth Lake, Minneapolis

Bassett Creek Watershed Management Commission

Executive Summary: 2017 Annual Report



2017 Activities & Achievements

The BCWMC worked on the following activities in 2017 in order to fulfill its mission:
Stewardship of Water Resources to Protect and Enhance Our Communities.

Major Projects (Capital Improvement Program)

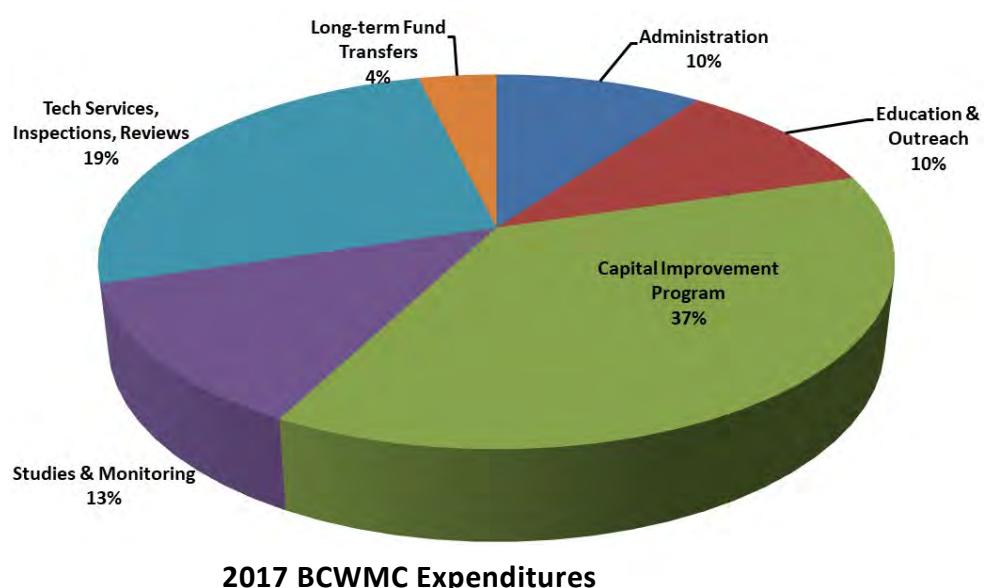
The BCWMC continued to implement its capital improvements program. Information on all BCWMC projects (completed, on-going, and proposed) can be found at www.bassettcreekwmo.org.



- **COMPLETED PROJECTS:** 1) Northwood Lake Improvement Project in New Hope that includes a 160,000-gallon underground tank that captures storm water runoff for use in irrigation, rain gardens and a storm water pond. The project was partially funded with city contributions, a Clean Water Fund grant and a Clean Water Partnership Grant. 2) Honeywell Pond Expansion Project in Golden Valley that improves the pollution removal capacity of the pond and uses a pumping station to pump storm water from the pond to ballfields for irrigation. 3) Phase 1 of the Main Stem Restoration Project 10th Ave. to Duluth St. in Golden Valley included stream bank shaping, placement of field stone rock and 12-inch bio-logs, repair of storm sewer outlets and native vegetation planted along the streambanks. Phase 2 which includes maintenance of the new vegetation will continue through 2018.
- **UNDERWAY:** Project design was completed and construction began on the Plymouth Creek Restoration Project in Plymouth. The project includes repairing eroding streambanks and establishing vegetation along Plymouth Creek in Plymouth Creek Park and downstream of Fernbrook Ave. This project received grant funds from Hennepin County and a Clean Water Fund Grant.
- **UNDERWAY:** Project designs were completed for the Main Stem Erosion Repair Project in Minneapolis near the Fruen Mill and downstream of Cedar Ave. Construction is planned for 2018. This project received Environmental Response Funds from Hennepin County.
- **UNDERWAY:** The feasibility study was completed and project designs began for the Bassett Creek Park Pond Phase I Dredging Project: Winnetka Pond in Crystal. Construction is slated for late 2018/early 2019.

Budget

In FY 2017, the BCWMC spent approximately \$699,400 on activities and programs and \$416,600 on capital projects. BCWMC income included \$500,000 from member cities, \$781,398 in grants, \$19,400 in reimbursements, and \$73,700 in development review fees. Another \$1.304 million was collected through a Hennepin County tax levy on watershed residents for the capital projects. For an itemization or more information on the BCWMC's 2017 expenditures, see the Year End Financial Report in Appendix A or the financial audit online.



Bassett Creek Watershed Management Commission Executive Summary: 2017 Annual Report

Water Monitoring Activities

The Bassett Creek Watershed Management Commission (BCWMC) is governed by a board composed of representatives from each of the nine member cities: Crystal, Golden Valley, Medicine Lake, Minneapolis, Minnetonka, New Hope, Plymouth, St. Louis Park and Robbinsdale. Representatives are appointed by their cities and serve three-year terms.

The BCWMC assessed the health of its lakes and streams through various monitoring activities including:

- Assessed the health of Lost, Sweeney, and Twin Lakes by collecting data on water quality, plankton, and aquatic plants (Appendix B)
- Participated in Metropolitan Council Environmental Services' Citizen-Assisted Monitoring Program (CAMP) for seven lakes
- Performed continuous stream monitoring on Bassett Creek at the Watershed Outlet Monitoring program coordinated by the Metropolitan Council Environmental Services

Find information about all the major BCWMC lakes & streams at:
www.bassetcreekwmo.org



Education & Outreach Activities

- Continued partnering with Metro Blooms on the Harrison Neighborhood Project to engage residents, train youth, and install water quality practices in Minneapolis' Near North neighborhood. Received \$100,000 grant from the Met Council in 2016 and \$134,500 Clean Water fund grant in 2017.
- Participated with the West Metro Water Alliance, a consortium of watershed organizations and other partners that collaborate on education programming including programs in 4th grade classrooms, and development and promotion of the "Pledge to Plant" campaign.
- Provided watershed education to the public at the Plymouth Yard/Garden Expo, the Golden Valley Arts and Music Festival, and the Westwood Nature Center restoration event.
- Provided watershed map, salt dispenser cups, and dog waste bag dispensers at watershed education events.
- Provided financial support to Metro Watershed Partners for their "Clean Water MN" media campaign, and the Children's Water Festival.
- Provided funding for Commissioner education for conference registrations.
- Provided funding for the Hennepin County's River Watch - a program for high school students to collect benthic invertebrates to determine stream health.
- Hosted "Parking Lot and Sidewalk Winter Maintenance Workshop" for twenty-one city staff, private applicators, and parks district staff. Most participants took an exam to become certified in level one "smart salting."
- Designed, had fabricated and Installed Bassett Creek signs at four creek crossings in Golden Valley.



I. Annual Activity Report

This annual report covers the Bassett Creek Watershed Management Commission's (BCWMC) activities for fiscal year 2017 (February 1, 2017—January 31, 2018). The BCWMC Annual Report was prepared to meet the Annual Reporting Requirements as set forth in Minnesota Rules Chapter 8410.0150, subparts 1, 2, and 3.

A. 2017 Commissioners

Municipality / Term Expiration	Commissioners	Alternates
Crystal February 1, 2018	Guy Mueller, Vice Chair	Tim Wodarski
Golden Valley February 1, 2018	Stacy Hoschka, Treasurer	Jane McDonald Black
Medicine Lake February 1, 2018	Clint Carlson	Gary Holter
Minneapolis February 1, 2019	Michael Welch	Lisa Goddard (until March 2017)
Minnetonka February 1, 2019	Michael Fruen	Jacob Millner (until November 2017) Bill Monk (starting November 2017)
New Hope February 1, 2019	John Elder	Pat Crough
Plymouth February 1, 2020	Jim Prom	John Byrnes
Robbinsdale February 1, 2020	Mike Scanlan, Secretary	Wayne Sicora
St. Louis Park February 1, 2020	Jim de Lambert, Chair	Patrick Noon

B. BCWMC Staff and Consultants

Administrator	Engineer	Attorney
Laura Jester Keystone Waters LLC 16145 Hillcrest Lane Eden Prairie, MN 55346 952-270-1990 laura.jester@keystonewaters.com	Karen Chandler, P.E. Jim Herbert, P.E. Len Kremer, P.E. Barr Engineering Co. 4300 MarketPointe Dr. Minneapolis, MN 55435 952-832-2600 kchandler@barr.com jherbert@barr.com lkremer@barr.com	Troy Gilchrist Kennedy & Graven 470 U.S. Bank Plaza 200 South Sixth Street Minneapolis, MN 55402 612-337-9214 TGilchrist@Kennedy-Graven.com

Bassett Creek Recording Administrator

Dawn Pape
Lawn Chair Gardener
5901 Birchwood St.
Shoreview, MN 55126
dawn@lawnchairgardener.com

Deputy Treasurer

Susan Virnig
City of Golden Valley
7800 Golden Valley Road
Golden Valley, MN 55427
763-593-8010
svirnig@goldenvalleymn.gov

C. Watershed Management Plan, Mission Statement, Goals

The [2015 Bassett Creek Watershed Management Plan](#) was adopted in September 2015. The annual implementation program (Table 5-4), Capital Improvement Program (Table 5-3), monitoring program (Appendix A of the Plan), and education and outreach program (Appendix B of the Plan) are being implemented and progress is being documented and evaluated.

The mission statement of the BCWMC is *the stewardship of water resources to protect and enhance our communities.*

The BCWMC's goals, as stated in its *2015 Watershed Management Plan*, fall under the categories of water quality, flood control, erosion and sediment control, stream restoration, wetland management, groundwater, public ditches, and public involvement and information. The list of nineteen goals can be found in Section 4 of the Watershed Management Plan.

In July 2017, the BCWMC adopted a minor plan amendment to update Table 5-3, the Capital Improvement Program with the following changes:

- Added the Mt. Olivet Stream Restoration Project (ML-20) in the City of Plymouth to reduce erosion, total suspended solids, and phosphorous loading to Medicine Lake.
- Added the Jevne Park Stormwater Pond Project (ML-21) in the City of Medicine Lake to increase the capacity of an existing pond and wetlands located in Jevne Park to collect and store stormwater runoff during heavy rainfall to improve the water quality of Medicine Lake.

- Added the Westwood Lake Water Quality Improvement Project (WST-2) in the City of St. Louis Park to be constructed to decrease and improve the quality of stormwater runoff in conjunction with the reconstruction of the Westwood Hills Nature Center building and parking lot.
- Added the Parkers Lake Drainage Improvement Project (PL-7) to the CIP in the City of Plymouth will reduce erosion, total suspended solids, and phosphorous loading to Parkers Lake.
- Revised and added to Project BC-2/BC-8, the Sandburg Rd and Louisiana Avenue Water Quality Improvement and Flood Reduction Project to the Medicine Lake Road and Winnetka Avenue Long Term Flood Mitigation Plan Implementation Project (BC-2,3,8,10) in the cities of Golden Valley, Crystal, and New Hope. This new project will address much of the same flooding concerns as the previous project and will implement parts of the recently completed Medicine Lake Road and Winnetka Avenue Long Term Flood Mitigation Plan.
- Removed the Wirth Park Area Water Quality Improvement Project (BC-3) from the CIP. This project in the City of Golden Valley was slated to treat untreated stormwater runoff to reduce phosphorus and sediment pollution. This project was removed from the CIP because much of this area will be treated by practices to be installed by the Metropolitan Council through the construction of the Bottineau Blue Line Light Rail Project.

The Plan was also updated in 2017 to:

- Revise the water quality requirements for linear projects
- Update floodplain elevations resulting from the completed XP-SWMM hydrologic model
- Revise the fee structure for BCWMC development/redevelopment projects

D. 2017 Activities

The BCWMC conducted the following activities in 2017. Work associated with review of development proposals is listed in Section E. Work related to water quality monitoring is addressed in Section F.

1. Capital Improvements Program (CIP)

The BCWMC continued to implement its capital improvements program. The complete 10-year CIP can be found in Table 5-3 in Section 5.0 of the 2015 Watershed Management Plan. Information, photos, related documents (including final documents of completed projects), and progress on projects can be found at: <http://www.bassettcreekmo.org/projects>. In 2017, progress on CIP projects included:

- COMPLETED: Northwood Lake Improvement Project in New Hope that includes a 160,000-gallon underground tank that captures storm water runoff for use in irrigation, plus rain gardens and a storm water pond. The project was partially funded with city contributions, a Clean Water Fund grant and a Clean Water Partnership Grant.
- COMPLETED: Honeywell Pond Expansion Project in Golden Valley that improves the pollution removal capacity of the pond and uses a pumping station to pump storm water from the pond to ballfields for irrigation.
- COMPLETED: Phase1 of the Main Stem Restoration Project 10th Ave. to Duluth St. in Golden Valley included stream bank shaping, placement of field stone rock and 12-inch bio-logs, repair of storm sewer outlets and native vegetation planted along the streambanks. Phase 2 which includes maintenance of the new vegetation will continue through 2018.

- UNDERWAY: Project design was completed and construction began on the Plymouth Creek Restoration Project in Plymouth. The project includes repairing eroding streambanks and establishing vegetation along Plymouth Creek in Plymouth Creek Park and downstream of Fernbrook Ave. This project received grant funds from Hennepin County and a Clean Water Fund Grant.
- UNDERWAY: Project designs were completed for the Main Stem Erosion Repair Project in Minneapolis near the Fruen Mill and downstream of Cedar Ave. Construction is planned for 2018. This project received Environmental Response Funds from Hennepin County.
- UNDERWAY: The feasibility study was completed and project designs began for the Bassett Creek Park Pond Phase I Dredging Project: Winnetka Pond in Crystal. Construction is slated for late 2018/early 2019.
- UNDERWAY: Feasibility studies were started for the Bryn Mawr Meadows Water Quality Project in Minneapolis, the Westwood Lake Improvement Project in St. Louis Park, and the DeCola Ponds B & C Improvement Project in Golden Valley.
- ON HOLD: Four Seasons Mall Area Water Quality Project in Plymouth: Although project plans were approved in 2013, this project was delayed due to significant concerns from local residents. Alternatives were evaluated in 2014 and 2015. In February 2017, the BCWMC entered an agreement with a private redeveloper of the Four Seasons Mall site to provide funding for storm water treatment measures that go above and beyond the required storm water management requirements. 90% design plans were approved in August 2017 but no further action has been taken.

2. Grant Administration

- Submitted final project report for MPCA Clean Water Partnership Grant for the Northwood Lake Improvement Project in New Hope. (2015 Grant)
- Submitted final project report for DNR Flood Damage Reduction Grant for XP-SWMM Phase II Project. (2015 Grant)
- Submitted project reports for BWSR Clean Water Fund Grant for the Northwood Lake Improvement Project in New Hope. (2015 Grant)
- Submitted grant reports for Met Council Stormwater Grant for Harrison Neighborhood Project.
- Received Clean Water Fund grant for Community Engagement for Harrison Neighborhood Project, developed work plan and executed agreement.
- Received Clean Water Fund grant for Plymouth Creek Restoration Project, developed work plan and executed agreement.

3. Annual Report

The BCWMC prepared the 2016 Annual Report as set forth in the Minnesota Rules Chapter 8410.0150. The report was submitted to the Board of Water and Soil Resources and is available online at the Bassett Creek Watershed Management Commission website at <http://www.bassettcreekwmo.org/document/annual-report-budget>.

4. Citizen Participation

The BCWMC encourages citizen participation, including providing an opportunity at each monthly BCWMC meeting for the Commission to hear citizen-input about agenda and non-agenda items. The BCWMC posts its meeting calendar, upcoming meeting agendas, meeting materials, and previous meeting minutes on its website (www.bassettcreekwmo.org) to provide citizens an opportunity to attend BCWMC and BCWMC Committee meetings and to monitor BCWMC actions. The BCWMC notified the public and the member cities and held a public hearing on May 18, 2017 regarding a proposed minor plan amendment to update its CIP. The BCWMC held another public hearing on September 21, 2017, regarding the 2018 proposed CIP project: Bassett Creek Park Pond Dredging Project Phase I: Winnetka Pond Dredging (BCP-2). (See Section H below for further information on public involvement and education.)

5. BCWMC Website and Social Media

The BCWMC regularly maintained and updated its website which features easily accessed data and information on the priority lakes and streams and BCWMC Capital Improvement Projects, along with a meeting and event calendar, interactive maps, and a document library. A “latest news” section and “featured project” on the homepage are updated regularly. The BCWMC contracts with HDR, Inc. to host the website and provide technical assistance, as needed. (Appendix D includes website analytics.)

In 2017, the BCWMC contracted with the Lawn Chair Gardener to post weekly information on the BCWMC Facebook page. The BCWMC is working on increasing the number of followers to further disseminate its news, educational messages, and information.

6. Water Quantity

The BCWMC continued its lake- and stream-gauging program. The lake-gauging program consisted of collecting lake-level readings at Medicine Lake, Sweeney Lake, Parkers Lake, Westwood Lake, Crane Lake (Ridgedale Pond), Northwood Lake and the Theodore Wirth Park storage area (upstream of the Highway 55 control structure). Lake levels were measured twice per month between April and September, and once per month outside this period.

The stream-gauging program consisted of periodically surveying stages or inspecting the creek during periods of high flow. The BCWMC also participated with the Metropolitan Council on the watershed outlet monitoring program (WOMP) designed to continuously monitor flow and water quality.

7. Watershed Inspections

As of the 2014 fiscal year, the BCWMC no longer performs monthly erosion control inspections of construction sites within the watershed. The watershed inspection program includes BCMWC inspection of sites or sending communications to developers, only at the request of the member cities or the Commission. No inspections were requested or performed in 2017.

8. Flood Control Project Inspections

On October 16, 2017, the BCWMC performed its annual Flood Control Project inspections. The conditions of the flood control features were inspected and erosion, settlement, sedimentation, and structural issues were recorded, compiled into a report, and reported to the Commission at its December 21, 2017 meeting. The BCWMC distributed its findings and recommendations to the Minnesota Department of Natural Resources, the Army Corps of Engineers, and staff at the BCWMC member cities.

9. XP-SWMM Phase II Project & FEMA Modeling Project

At their April 16, 2015 meeting, the BCWMC approved the XP-SWMM Phase 2 work, to be phased over BCWMC fiscal years 2015 and 2016. The BCWMC continued to develop the XP-SWMM Phase 2 model during 2016. The work involved updating the watershed-wide XP-SWMM model developed in 2012 by further subdividing the watershed divides, incorporating upstream storage in ponds and wetlands, including the associated storm sewer data, using new soils data, incorporating Atlas 14 precipitation data, adjusting vertical datum's, performing flow monitoring, calibrating the model, and preparing a report. The preliminary results of the BCWMC XP-SWMM Phase 2 modeling were presented to the BCWMC Commissioners in January 2017 and the final report and the resulting updated floodplain elevations were approved in May 2017. The 2015 Watershed Management Plan was updated to reflect the new floodplain elevations and a [fact sheet](#) was developed about the modeling project and updated floodplain elevations.

The XP-SWMM Phase 2 modeling project was partially funded by a Flood Damage Reduction Grant from the MN Department of Natural Resources (MnDNR).

In 2017, the MnDNR approached the BCWMC about updating the Federal Emergency Management Agency (FEMA) hydrologic and hydraulic modeling and creating the supporting GIS files for the Bassett Creek watershed with federal grant funds that would be administered through the MnDNR. Early in 2018, the BCWMC entered an agreement with the MnDNR to perform this work, building on the newly completed XP-SWMM model. This project will continue through June 2019. The work scope is available [here](#).

10. Development Proposals

The BCWMC reviewed 44 development proposals in the watershed for conformance BCWMC policies. As a comparison, the BCWMC reviewed 44, 38, 35, 41, 37, and 32 development proposals respectively in 2016, 2015, 2014, 2013, 2012 and 2011. See Section E: Project Reviews.

11. Review of Municipal Plans and Adjacent WMO Plans/Plan Amendments

In 2017, the BCWMC did not receive any municipal plans nor adjacent WMO plans/plan amendments for review. The BCWMC received and commented on proposed revised stormwater ordinances for the City of Crystal.

12. Aquatic Plant Management and Aquatic Invasive Species

Starting in June 2016 and culminating in June 2017, the BCWMC convened an Aquatic Plant Management/Aquatic Invasive Species (APM/AIS) Committee to determine an appropriate role for the Commission in these issues. The committee included representatives from lake groups, Three Rivers Park District, Minneapolis Park and Rec Board, MnDNR, Hennepin County, Met Council, member cities, and BCWMC Commissioners and staff. [Recommendations of the committee](#) were approved in the fall of 2017 and several were carried out in 2017 including implementing a spot treatment of curly-leaf pondweed in Medicine Lake, and developing an [AIS Rapid Response Plan](#) for key AIS in priority lakes.

13. Technical Advisory Committee

Technical Advisory Committee meetings are open to the public and the meeting times and dates are posted on the BCWMC's website. The BCWMC directed its Technical Advisory Committee (TAC) to meet four times in 2017 to review and work on the following items:

- Develop the 2019 – 2023 Capital Improvement Program list
- Recommend revisions to BCWMC performance standards for linear projects
- Recommend revisions to the BCWMC fee structure for development/redevelopment reviews
- Consider requests for use of Channel Maintenance Funds
- Review XP-SWMM Phase 2 report, discuss communication needs regarding changes to floodplain elevations, recommend timing and process for annual model updates
- Recommend BCWMC involvement in FEMA hydrologic and hydraulic modeling project

14. Impaired Waters and Total Maximum Daily Loads (TMDL) Studies

The following water bodies in the Bassett Creek Watershed are listed in the Minnesota Pollution Control Agency's (MPCA) Draft 2014 "*Inventory of Impaired Waters*". The inventory includes listings of (1) impaired waters that require the development of a TMDL study, (2) impaired waters that have an approved TMDL study, but are not yet meeting water quality standards, and (3) impaired waters from natural causes that do not require a TMDL study. The inventory is available at the MPCA's Impaired Waters website: <http://www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html>.

Water Body (Lake/River ID #)	Pollutant or Stressor (Year of Listing)
Bassett Creek from Medicine Lake to Mississippi River (07010206-538)	Fish bioassessments (2004) Fecal coliform (2008) Chloride (2010)
Plymouth Creek from Headwaters to Medicine Lake (07010206-526)	E. coli (2014) Chloride (2014) ²
North Branch Bassett Creek from Northwood Lake to Bassett Creek (07010206-526)	E. coli (2014)
Sweeney Lake (27-0035-01)	Nutrient/Eutrophication Biological indicators (2004) Chloride (2014) ²
Wirth Lake (27-0037-00)	Nutrient/Eutrophication Biological indicators (2002) ³ Mercury in fish tissue (1998) ¹ Chloride (2014) ²
Medicine Lake (27-0104-00)	Nutrient/Eutrophication Biological indicators (2004) Mercury in fish tissue (2004) ¹
Parkers Lake (27-0107-00)	Mercury in fish tissue (1998) Chloride (2014) ²
Spring Lake (27-0654-00)	Chloride (2014) ²

Water Body (Lake/River ID #)	Pollutant or Stressor (Year of Listing)
Northwood Lake (27-0627-00)	Nutrient/Eutrophication Biological indicators (2004)

¹ The MPCA completed a statewide mercury TMDL that was approved 2007

² MPCA proposed several new impairment listings for chloride in September, 2013. Following responses to comments, these listings remained on the 2014 Proposed Impaired Waters List (updated 4/15/2014).

³ See discussion below for delisting of Wirth Lake for this impairment in 2014

- **Bassett Creek Fish Bioassessment Listing**—In the Final EPA-Approved MPCA 2004 CWA 303(d) *List of Impaired Waters*, the Main Stem of Bassett Creek, from Medicine Lake to the Mississippi River, was listed as impaired for fish (biota). In response to this listing, the MPCA completed fish sampling of the creek in 2008. The MPCA is currently reviewing the existing biota standards/listing criteria. The TMDL will be completed as part of the future watershed-wide TMDL (see “Watershed-wide TMDL”).
- **Bassett Creek Fecal Coliform Listing and E. coli listings for Plymouth Creek and North Branch, Bassett Creek**—In the 2008 Final TMDL List Inventory of all Impaired Waters, Bassett Creek, from Medicine Lake to the Mississippi River, was listed as impaired for fecal coliform. In response to this listing, the BCWMC and the MPCA cooperated in collecting and analyzing E. coli samples of Bassett Creek between July 2008 and June 2010. The samples confirmed the presence of E. coli bacteria. The Bassett Creek watershed is included in the Upper Mississippi River Bacteria TMDL project. Additional data for the Upper Mississippi River E. coli TMDL was collected in 2010 and 2011, and identification of the likely sources of bacteria pollution began in 2011 and continued in 2013. Stakeholder meetings also continued in 2013. The TMDL report incorporated the draft 2014 impaired waters listings for E. coli in Plymouth Creek and North Branch, Bassett Creek, and was approved in 2014. The BCWMC provided a comment letter on the TMDL study in May, 2014, reviewed the TMDL Implementation Plan in 2015, and attended the June 25, 2015 TAC meeting to discuss the plan with MPCA staff. The final TMDL Implementation Plan was approved by the MPCA in February, 2016. The Upper Mississippi River E. coli TMDL project website maintained by the MPCA is at <https://www.pca.state.mn.us/water/tmdl/upper-mississippi-river-bacteria-tmdl-project>.
- **Sweeney Lake TMDL Study**—In the Final EPA-Approved MPCA 2004 CWA 303(d) *List of Impaired Waters*, Sweeney Lake was listed as impaired due to excess nutrients (phosphorus). The TMDL was approved on August 10, 2011.
- **Wirth Lake TMDL Study**—In the Final EPA-Approved MPCA 2004 CWA 303(d) *List of Impaired Waters*, Wirth Lake was listed as impaired due to excess nutrients (phosphorus in amounts greater than the state’s goal of 40 micrograms per liter). The Wirth Lake TMDL and implementation plan were approved October 25, 2010. The implementation plan identified one project—modifying the Wirth Lake outlet structure to prevent flow from Bassett Creek to Wirth Lake during flood periods—to achieve the annual load reductions prescribed in the TMDL. The Wirth Lake Outlet Modification Project is estimated to reduce phosphorus loading to the lake by an average of 55 pounds per year. The project was substantially completed in November 2012. A detailed comparison of the lake water quality during the past ten years with MPCA’s eutrophication standards revealed that Wirth Lake was no longer impaired for excess nutrients. A request for re-categorization was submitted to MPCA in October, 2013. In December, 2013 the BCWMC submitted a technical memorandum to MPCA requesting delisting of Wirth Lake for nutrient/eutrophication biological indicators. The memo provided a detailed water quality evaluation for MPCA consideration during the formal comment period for development of the

draft 2014 impaired waters list. MPCA responded to the delisting request by removing Wirth Lake from the Impaired Waters list in July, 2014.

- **Medicine Lake TMDL Study**—In the *Final EPA-Approved MPCA 2004 CWA 303(d) List of Impaired Waters*, Medicine Lake was listed as impaired due to excess nutrients (phosphorus). The TMDL and implementation plan were approved on February 8, 2011.
- **Watershed-wide TMDL** —In 2011, the MPCA indicated that funding for a watershed-wide TMDL for the Bassett Creek watershed would be available in 2020 or later. The watershed-wide TMDL would cover the current Bassett Creek and Northwood Lake impairments, along with any future listings between now and 2020.
- **Twin Cities Metro Area (TCMA) Chloride Project** —In the *2014 Draft TMDL List Inventory of all Impaired Waters*, MPCA proposed several new impairment listings for chloride in September, 2013. Following responses to comments from BCWMC, five listings (tabulated above) remained on the 2014 Proposed Impaired Waters List (updated 4/15/2014). Based on the available monitoring data for chloride, three BCWMC water bodies—Northeast drainage to Medicine Lake, the Rockford Road drainage to Medicine Lake and Medicine Lake, were placed in a category of high risk waters, which can be viewed as a watch list for future changes. The MPCA recently finalized the TCMA Chloride Management Plan that is intended to balance the public safety needs for deicing with attainment of the chronic and acute water quality standards for chloride. The BCWMC provided comments on the draft TMDL Report and Chloride Management Plan in August 2015. The management plan will include a performance-based approach for meeting chloride TMDLs and is also intended to protect water bodies with water quality that is currently better than the standard. A winter maintenance assessment tool has recently been developed to support TMDL implementation efforts. The Chloride TMDL and road salt/water quality project website maintained by the MPCA is at <https://www.pca.state.mn.us/water/road-salt-and-water-quality>.
- **TMDL Implementation Reporting** Although the BCWMC is not a MS4, the Wirth Lake, Medicine Lake, and Sweeney Lake TMDLs assigned the BCWMC a role in the implementation of the TMDLs. For example, the Medicine Lake TMDL calls for the BCWMC to serve as the “convener of action for the categorical TMDL, but not as a responsible entity.” The BCWMC’s interpretation of this role is that the BCWMC should track implementation of the TMDLs, which would likely include the following tasks:
 - Reporting on TMDL implementation activities to the MPCA. TMDL progress reports will be due one year after the MPCA issues the new MS4 permit. However, the new MS4 permit was not issued in 2012, so the BCWMC did not develop the implementation reports. The new MS4 permit became effective on August 1, 2013, which means the TMDL progress reports will be due each year after that, in June.
 - Estimating and reporting progress towards achieving the assigned wasteload allocations. The BCWMC’s watershed P8 model, originally completed in 2013 and updated annually, is an essential tool for estimating reductions in phosphorus loading.
 - Monitoring lake water quality on an annual basis. See Section G “2017 Water Quality Monitoring Data and Studies” regarding monitoring of these lakes in 2017.
 - Tracking implementation of projects and quantifying progress towards meeting the TMDL allocations for the MS4s in the impaired watersheds.

E. BCWMC Project Reviews

The following table, *Proposed projects reviewed by BCWMC in fiscal year 2017* includes development proposals, Wetland Conservation Act, and other plans that were submitted to the BCWMC for review. The list does not include review of capital improvement projects and preliminary review of the Blue Line and Southwest LRT projects.

Proposed Projects Reviewed by BCWMC in FY 2017¹

Application Form	Project Name	Date Submitted	City	Type
2016-24	Luther Support Center	6/24/2016	GV	Commercial
2016-32	CSAH 24 Reconstruction Project	1/27/2017	PLY	Street / Public Agency
2016-38	Northwood North Infrastructure Improvements	1/3/2017	NH	Street / Public Agency
2016-39	French Regional Park Pavement	1/13/2017	PLY	Street / Public Agency
2017-01	Agora	1/27/2017	PLY	Commercial/ Industrial
2017-02	Golden Valley 2017 PMP	2/15/2017	GV	Street/ Hwy/ Trails/ Utility/ Municipal
2017-03	CenterPoint Energy MBLIC Replacement	2/17/2017	GV	Street/ Hwy/ Trails/ Utility/ Municipal
2017-04	Dakota Growers Pasta Rail Expansion	3/27/2017	NH	Commercial/ Industrial/ Institutional
2017-05	Daikin Addition & Parking Lot	3/17/2017	PLY	Commercial/ Industrial/ Institutional
2017-06	Ridgedale Center Out Parcel Development Phase 3	3/20/2017	MTKA	Commercial/ Industrial/ Institutional
2017-07	212 James Ave N	3/28/2017	MPLS	Commercial/ Industrial/ Institutional
2017-08	Northwood Mill Area Place Replacement	4/3/2017	NH	Street/ Hwy/ Trails/ Utility/ Municipal
2017-09	BNSF Bridge 1.7 (LS 202)	4/17/2017	MPLS	Street/ Hwy/ Trails/ Utility/ Municipal
2017-10	Neill Elementary Deferred Maintenance	4/18/2017	CRY	Commercial/ Industrial/ Institutional
2017-11	GV/MPLS Interceptor Rehab	4/19/2017	Multiple Cities	Street/ Hwy/ Trails/ Utility/ Municipal
2017-12	10th Avenue North Culvert Replacement	4/20/2017	GV	Street/ Hwy/ Trails/ Utility/ Municipal
2017-13	Dakota Supply Group Parking	5/3/2017	PLY	Commercial/ Industrial/ Institutional
2017-14	Room and Board LD Repaving	5/8/2017	GV	Commercial/ Industrial/ Institutional
2017-15	Banner Eng. Outlet A Addition	5/12/2017	PLY	Commercial/ Industrial/ Institutional
2017-16	Pilgrim Lane Elementary Playfield	5/15/2017	PLY	Commercial/ Industrial/ Institutional
2017-17	Home2 Suites Hotel	5/18/2017	PLY	Commercial/ Industrial/ Institutional
2017-18	Armstrong HS Building Exterior	5/22/2017	PLY	Commercial/ Industrial/ Institutional
2017-19	CSAH 66 Culvert Replacement	5/24/2017	GV	Street/ Hwy/ Trails/ Utility/ Municipal

¹Projects in **bold** were presented for BCWMC review and comment at a BCWMC meeting.

Application Form	Project Name	Date Submitted	City	Type
2017-20	Ridgedale Regional Service Center	5/24/2017	MTKA	Commercial/ Industrial/ Institutional
2017-21	Creekside Woods I & II	5/24/2017	PLY	Single-family Subdivision
2017-22	Glory of Christ Lutheran Church Addition	5/25/2017	PLY	Commercial/ Industrial/ Institutional
2017-23	Prescription Landscape Parking Lot	6/2/2017	CRY	Commercial/ Industrial/ Institutional
2017-24	Wagner Spray Tech Phase 3	6/6/2017	PLY	Commercial/ Industrial/ Institutional
2017-25	1820 Major Drive North Landscape	6/20/2017	GV	Single-family Home
2017-26	Plymouth Commons Apartments	6/21/2017	PLY	Multi-residential
2017-27	Northwood East Ballfield Imp	7/25/2017	NH	Street/ Hwy/ Trails/ Utility/ Municipal
2017-28	Morrie's Parking Lot Expansion	8/4/2017	PLY	Commercial/ Industrial/ Institutional
2017-29	Good Samaritan Assisted Living	8/25/2017	NH	Multi-residential
2017-30	Shelard Village Site Improvements	9/6/2017	SLP	Multi-residential
2017-31	4700 Nathan Lane North Parking Stalls	9/12/2017	PLY	Commercial/ Industrial/ Institutional
2017-32	Theodore Wirth Trail Construction	9/15/2017	GV	Street/ Hwy/ Trails/ Utility/ Municipal
2017-33	Metro Transit C Line BRT	9/27/2017	MPLS	Street/ Hwy/ Trails/ Utility/ Municipal
2017-34	Westwood Hills Park - St. Louis Park WCA	10/10/2017	SLP	Wetland
2017-35	Golden Valley Road Senior Living	10/27/2017	GV	Multi-residential
2017-36	Tenant Co. Headquarters	10/27/2017	GV	Commercial/ Industrial/ Institutional
2017-37	Mpls Impound Lot Facility Improvements	10/27/2017	MPLS	Street/ Hwy/ Trails/ Utility/ Municipal
2017-38	TMS Johnson Parking Lot Addition	11/7/2017	NH	Commercial/ Industrial/ Institutional
2017-39	Quail Ridge Drainage Improvement	11/14/2017	PLY	Street/ Hwy/ Trails/ Utility/ Municipal
2017-40	Request for Diversion of Surface Water Runoff for GV 2018 PMP Project	1/2/2018	GV	Street/ Hwy/ Trails/ Utility/ Municipal

¹Projects in **bold** were presented for BCWMC review and comment at a BCWMC meeting.

F. Water Quality Monitoring Data and Studies

The following water quality monitoring and water quality studies were performed in 2016:

- **Sweeney Lake Aeration Study** – In 2017, the BCWMC began a study of the effects of the Sweeney Lake aeration system on lake water quality. In 2017, the work included additional in-lake monitoring, sediment testing, and data analysis. In 2018, the study will be completed, including modeling and overall assessment.
- **Schaper Pond Effectiveness Monitoring** – In late 2015, the City of Golden Valley installed a floating water baffle in Schaper Pond to improve the pond's phosphorus removal and reduce the phosphorus loading to Sweeney Lake (BCWMC CIP project SL-3). In 2017, the BCWMC monitored the inflows and outflow from Schaper Pond to understand the impact of the baffle installation on Schaper Pond's ability to remove pollutants. The data analysis will be completed in 2018.
- **Chloride Source Assessment** – In 2017, the BCWMC performed a watershed-wide chloride source assessment, which included collecting watershed-wide spring snowmelt grab samples at 18 locations, analysis of WOMP continuous conductivity monitoring, and a GIS hotspot mapping analysis based on the extent of land uses that contribute inordinately higher amounts of road salt runoff.
- **Citizens Assisted Lake Monitoring Program (CAMP)** — The BCWMC participated with the Metropolitan Council Environmental Services (MCES) in its citizen-assisted lake-monitoring program (CAMP). In 2017, citizen volunteers monitored the following lakes: Twin Lake and Sweeney Lake in Golden Valley, Northwood Lake in New Hope, two sites on Medicine Lake in Medicine Lake and Plymouth, Parkers Lake and Lost Lake in Plymouth, and Westwood Lake in St. Louis Park. Reports that include CAMP monitoring results can be found on the Met Council website at: <https://metro council.org/Wastewater-Water/Services/Water-Quality-Management/Lake-Monitoring-Analysis.aspx?source=child>
- **Detailed stream monitoring at Bassett Creek WOMP station**—Stream monitoring was performed in cooperation with the Metropolitan Council Environmental Services (MCES) as part of the stream monitoring and watershed outlet monitoring program (WOMP). The BCWMC contracts with Wenck & Associates to perform monitoring activities at this station. <http://www.metro council.org/Wastewater-Water/Services/Water-Quality-Management/Stream-Monitoring-Assessment.aspx?source=child>
- **Routine Lake Monitoring**—In 2017, the BCWMC monitored the water quality of Sweeney and Twin Lakes in Golden Valley and Lost Lake in Plymouth. Water samples were collected from the deepest location in each lake on six occasions from April through September 2017 and analyzed in the laboratory for total phosphorus, soluble reactive phosphorus, total nitrogen, chlorophyll *a*, and chlorides. Dissolved oxygen, temperature, specific conductance, pH, oxidation reduction potential (ORP), Secchi disc transparency (Secchi depth), and turbidity were measured in the field. On five occasions from June through September, water samples were collected and analyzed for phytoplankton (algae) and zooplankton (microscopic crustaceans). An aquatic plant survey was also performed on two occasions, in June and August.

Reports for each lake are included in Appendix B and are available on the BCWMC website.

- **Monitoring by Partners** – In 2017, Medicine Lake in Plymouth and Wirth Lake in Golden Valley were monitored by the City of Plymouth/Three Rivers Park District and the Minneapolis Park and Rec Board, respectively.
- **River Watch Program**—The BCWMC continues to support the Hennepin County Environmental Services' River Watch Program. The program began in 1995 and uses student volunteers to conduct biological monitoring as a means of monitoring water quality. The grading scale used in River Watch takes into account three major biotic indices used routinely in biological monitoring programs including the Family Biotic Index, EPT (Ephemeroptera, Plecoptera, and Trichoptera), and the number of families.

Students have been monitoring Bassett Creek since 1999. There were two River Watch sites in the Bassett Creek watershed in 2017. The *Hennepin County River Watch Report 2016* is available on the Hennepin County website at <http://www.hennepin.us/business/work-with-henn-co/riverwatch>.

G. Local Plan Adoption

The following table shows the status of the surface water management plan preparation for each municipality.

Municipality	Local Plan Status	Comments
Crystal	Completed	Local plan was approved by the BCWMC in January 2010. Resolution 10-02.
Golden Valley	Completed	Revised plan was approved by the BCWMC in September 2008. Resolution 08-06.
Medicine Lake	Completed	Local plan was approved by the BCWMC in January 2010. Resolution 10-05.
Minneapolis	Completed	Local plan was approved by the BCWMC in September 2006. Resolution 2006-04.
Minnetonka	Completed	Revised local plan was approved by the BCWMC in September 2008. Resolution 08-05.
New Hope	Completed	Revised plan was approved by the BCWMC in October 2008. Resolution 08-08.
Plymouth	Completed	Local plan conditionally approved by the BCWMC in February 1999. Resolution 99-3. Revised plan was approved by the BCWMC in November 2008. Resolution 08-09.
Robbinsdale	Completed	Local plan was approved by the BCWMC in October 1996; reconfirmed in April 1997. Resolution 97-5. Local plan was reviewed as part of the city's comprehensive plan review in 2008. Revised plan was submitted to the BCWMC for review in December 2009. Resolution 10-04.

St. Louis Park	Completed	Revised plan was approved by the BCWMC in September 2009. Resolution 09-06.
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H. Watershed Communication/Public Education

In accordance with Minnesota Rules, Chapter 8410.0100, Subpart 4, the BCWMC utilized the following information sources for providing information to the general public:

- **Improvements and Development Requirements**—The document *Requirements for Improvements and Development Proposals*, prepared by the BCWMC (updated in 2017), is posted for use and reference on the BCWMC's website at <http://www.bassettcreekwmo.org/developer>.
- **Website**—The BCWMC launched a new user-friendly website in 2016 and maintained the information including latest news, contact list, meeting calendar, meeting materials, watershed plan, data, and projects. In 2017, there were approximately 6,945 sessions with 22,849 page views. A copy of the website Usage Report from January 1, 2017, through December 31, 2017, 2017, is included in Appendix D.
- **BCWMC Meeting Packet**— Each month in 2017 the BCWMC posted electronic all meeting materials on its website, e-mailed the link to approximately 40 parties, and mailed paper copies of materials to those requesting them (approximately 11 people).
- **Publications**—The Commission published its public hearing notices in its official publication, *Finance and Commerce* as well as other publications including the Sun Post and Minneapolis neighborhood newsletters.
- **West Metro Water Alliance (WMWA)** – The BCWMC continued its participation in WMWA along with several watershed management and other water-related organizations in the west Metro area. Through WMWA, these organizations collaborated on educational campaigns including the Watershed PREP program aimed at educating 4th grade students about water resources and the impacts of stormwater. WMWA also continued to promote its “Pledge to Plant” campaign aimed at engaging residents and businesses in converting turf or hard surfaces to native plantings. <http://www.westmetrowateralliance.org/>.
- **Metro WaterShed Partners**—The BCWMC participated as a member of the Metro WaterShed Partners as a general supporter of the program and also as a supporter of the Metro Clean Water Minnesota Media Campaign. Metro Watershed Partners maintains a listserve and a website as forums for information sharing, holds monthly meetings for members to collaborate, and displays an exhibit at the State Fair to educate the public about watersheds. The Clean Water Minnesota Media Campaign is a stormwater education collaboration that develops and delivers stormwater educational materials to a broad audience through television, radio, and billboard campaigns as well as through its website www.cleanwatermn.org.

- **Participation in Community Events and Meetings** – In 2017, the BCWMC participated in the Plymouth Home Expo with an information booth and display. Water-related education materials and information was disseminated by watershed Commissioners during the two-day event. Also in 2017, the BCWMC participated in the Golden Valley Arts and Music Festival by manning an information booth and display where materials and maps were disseminated, and participated in the Westwood Nature Center restoration event with Great River Greening where Commissioners gave a brief overview of the BCWMC and provided other educational materials and information.
- **Harrison Neighborhood Project** – In 2017, the BCWMC continued its partnership and support of Metro Blooms' Harrison Neighborhood Project. The project aims to engage residents, train youth, and install water quality practices in Minneapolis' Near North neighborhood. The BCWMC received a \$100,000 grant from the Met Council for this project on behalf of Metro Blooms in 2016 and was awarded a Clean Water Fund grant from the MN Board of Water and Soil Resources in 2017.
- **Smart Salt Training for Parking Lots and Sidewalks** – In September 2017, the BCWMC hosted a "Parking Lot and Sidewalk Winter Maintenance Workshop" for twenty-one city staff, private applicators, and parks district staff. Most participants took an exam to become certified in level one "smart salting."
- **Creek Crossing Signs** – In 2017, the BCWMC designed, had fabricated and installed "Bassett Creek" signs at four creek crossings in Golden Valley, including Douglas Drive – a Hennepin County highway.
- **Additional Educational Activities and Organizations** – In addition to the above-mentioned programs, the BCWMC financially sponsored Metro Blooms and the Children's Water Festival, and reimbursed registration costs to Commissioners to attend the Road Salt Symposium, Clean Water Summit, and the Water Resources Conference.



I. Professional Services Proposal

The BCWMC last solicited letters of interest for legal and engineering/technical consulting services in December 2016. The BCWMC received one proposal from a legal firm and four proposals from engineering firms. The BCWMC did not take action changing its legal firm from Kennedy Graven nor its engineering consultant from Barr Engineering. As per MN State Statute, the BWCMC will solicit proposals again in 2018.

J. Assessment of Changes in Fund Balance

A discussion of the fund balance is included in the BCWMC's annual financial audit report. A copy of the annual audit report is available on the BCWMC website at:
<http://www.bassettcreekwmo.org/document/annual-report-budget>.

K. Wetland Conservation Act

1991 Wetland Conservation Act—The interim program of the 1991 Wetland Conservation Act was effective through December 31, 1993. On January 1, 1994, the permanent program of the 1991 Wetland Conservation Act became effective. Each municipality was required to designate the local government unit (LGU) responsible for administrating the interim program and the permanent program of the 1991 Wetland Conservation Act. The following table indicates the LGU for each municipality.

Municipality	Permanent Program (Effective 1/1/94)
Crystal	Crystal
Golden Valley	Golden Valley
Medicine Lake	BCWMC
Minneapolis	Minneapolis
Minnetonka	Minnetonka
New Hope	New Hope
Plymouth	Plymouth
Robbinsdale	BCWMC
St. Louis Park	BCWMC

BCWMC = Bassett Creek Watershed Management Commission

In 2017, the BCWMC submitted to BWSR its WCA annual reporting form covering all 2017 WCA-related activities within the municipalities for which BCWMC is the LGU. The other municipalities were responsible for submitting the annual reporting form to BWSR for their respective municipality.

Wetland Mitigation Policy—The BCWMC's wetland management policies specify a preference for wetland mitigation to be performed within the same subwatershed as the impacted wetland.

II. 2018 Projected Work Plan

A. Capital Improvements Program (CIP)—The BCWMC will continue to implement its capital improvements program. In 2018, this work will include:

1. **Capital Improvement Program and Prioritization**—The BCWMC will review and update its 5-year capital improvement program, will request a minor plan amendment to make changes to the CIP, and will work to improve the process of project prioritization.
2. **Progress on CIP projects:**
 - Continue vegetation management for Schaper Pond Diversion Project and monitor the effectiveness of the project - (SL-3) in Golden Valley.
 - Seek alternatives for the Lakeview Park Pond Project (ML-8) in Golden Valley.
 - Cancel agreements with the City of Plymouth and Rock Hill Management to implement storm water management features on the redevelopment site (Agora) as the redevelopment project will not proceed as planned. The BCWMC will seek other opportunities to implement a project in this area.
 - Establish and maintain vegetation along the Main Stem Bassett Creek Restoration Project in Golden Valley (CR2015) 10th Avenue to Duluth St.
 - Finalize construction and establish vegetation along the Honeywell Pond Expansion Project (BC-4) in Golden Valley.
 - Finalize construction of the Northwood Lake Water Quality Improvement Project (NL-1) in New Hope.
 - Assess the condition of Twin Lake and determine the possible need for a second dose of alum (Golden Valley) (TW-2)
 - Finalize construction of the Plymouth Creek Restoration Project (CR2017-P) in Plymouth from Annapolis Lane extending 2,500 feet upstream and begin construction in winter 2017-2018.
 - Begin construction of the Main Stem Channel Restoration Project (CR2017-M) in Minneapolis from Cedar Lake Road to Irving Ave.
 - Finalize construction plans and begin construction of the Bassett Creek Park Pond Dredging Project, Phase I (BCP-2) in Crystal.
 - Finalize the feasibility studies and order the Westwood Lake Improvement Project and the Medicine Lake Rd and Winnetka Ave Long Term Flood Mitigation Plan Project; DeCola Ponds B & C Improvement Project; finalize the feasibility study for water quality improvements in Bryn Mawr Meadows, Main Stem Watershed (BC-5).

3. Begin feasibility studies for the following BCWMC 2020 CIP projects:

- Stormwater Pond in Jevne Park to alleviate flooding/improve water quality (ML-21)
- Crane Lake Improvement Project via Ridgedale Drive (CL-3)

4. Grant Administration:

- Submit final reports and requests for payment for the BWSR Clean Water Fund Grant for the Northwood Lake Improvement Project (NL-1).
- Submit progress reports for the BWSR Clean Water Fund Grants for the Plymouth Creek Restoration Project and the Harrison Neighborhood Community Engagement Project.
- Submit interim reports to the MnDNR for the FEMA modeling project for improved floodplain modeling and mapping.
- Submit interim reports to Hennepin County for the Emergency Response Fund grant for the Main Stem Erosion Repair Project and the Opportunity Grant for the Plymouth Creek Restoration Project.
- Submit invoices and final report for the Hennepin County AIS Prevention Grant.

B. Watershed Management Plan—In 2018 the BCWMC will seek a minor plan amendment to revise its Capital Improvements Program. The BCWMC will also review local water management plans as they are submitted to the watershed.

C. Additional Monitoring, Studies, and Programs

1. **Water Quantity**—The BCWMC will perform its lake- and stream-gauging program. The lake-gauging program will encompass Medicine Lake, Sweeney Lake, Parkers Lake, Westwood Lake, Crane Lake (Ridgedale Pond), Northwood Lake, Bassett Creek Park Pond and Theodore Wirth Park Storage area upstream of the TH 55 control structure. Two readings per month will be taken during the period April 1 – September 30; one reading per month will be taken outside this period. The stream-gauging program will consist of periodically surveying stages or inspecting the creek during periods of high flow. The program also includes periodic surveys of benchmarks.
2. **Sweeney Lake Aeration Study** – The BCWMC will study present the results of the study of the effects of year-round aeration on Sweeney Lake to lake residents and the BCWMC.
3. **Schaper Pond Effectiveness Monitoring** – The BCWMC will finalize the study of the effectiveness of the Schaper Pond Diversion Project and will present results.
4. **Flood Control Project Inspection**—The BCWMC will perform its annual flood control project inspection program, as set forth in the Bassett Creek Flood Control Project Operations and Maintenance Manual.

5. **Municipal Plan Review**—The BCWMC will review of the member cities' local water management plans and plan amendments, and BCWMC review of adjacent WMO plans and plan amendments, as needed.
6. **Water Quality**— Proposed water quality tasks for 2018 include:

 - **Water Quality Monitoring:** The BCWMC will perform detailed water quality monitoring as laid out its Water Monitoring Program
http://www.bassettcreekwmo.org/application/files/7914/4676/6436/Appendix_A_Monitoring_Plan.pdf In 2018, the BCWMC will monitor Parkers Lake in Plymouth and Westwood Lake in St. Louis Park. The BCWMC will also begin its intensive stream monitoring program with a site on the North Branch of Bassett Creek.
 - **Citizens Assisted Monitoring Program (CAMP):** The BCWMC has entered into an agreement with the Metropolitan Council Environmental Services (MCES) to participate in this program in 2018. Volunteer citizens will monitor the following lakes in 2018: Twin Lake and Sweeney Lake in Golden Valley, two sites of Medicine Lake in the cities of Medicine Lake and Plymouth, Northwood Lake in New Hope, Westwood Lake in St. Louis Park, and Parkers Lake and Lost Lake in Plymouth.
 - **Watershed Outlet Monitoring Program (WOMP):** The BCWMC is the local sponsor of this monitoring site in cooperation and with funding support from the Metropolitan Council. The Metropolitan Council Environmental Services (MCES) will provide up to \$5,000 per year in financial support between January 1, 2018, and December 31, 2019, to the BCWMC for operating the station and maintaining the rating curve. The BCWMC entered into an agreement with a Wenck & Associates to ensure the monitoring equipment is in working order, conduct routine maintenance of the WOMP site and equipment, collect samples, make in-situ field measurements, and coordinate sample delivery to MCES in 2018. BCWMC staff will continue to maintain the rating curve.
 - **River Watch Program:** The BCWMC will participate in the River Watch program managed by Hennepin County Environmental Services (HCES); up to four sites on Bassett Creek will be sampled. HCES will provide a final report of the sampling results to the BCWMC.
7. **Development Reviews**—The BCWMC will review development proposals in the watershed for conformance to water quality and flooding policies.
8. **Channel Maintenance Fund**—The BCWMC will continue to fund its Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund (the Channel Maintenance Fund). The BCWMC collects \$25,000 annually for the fund through an assessment paid by the member cities.
9. **Flood Control Long-Term Maintenance Fund**—The BCWMC established a long-term maintenance fund to be used to repair structures associated with the BCWMC Flood Control Project. The BCWMC collects \$25,000 annually for the fund through an assessment paid by the member cities. The fund balance is not to exceed \$1 million.

10. FEMA Modeling Project – The BCWMC will continue to implement the MnDNR-grant funded project to improve floodplain modeling and mapping for FEMA.

11. APM/AIS Work – The BCWMC will perform its role in rapidly responding to a new zebra mussel infestation in Medicine Lake (discovered in November 2017) and will implement other recommendations of the APM/AIS committee including treating curly-leaf pondweed in Medicine Lake, coordinating with Three Rivers Park District in purchasing a decontamination unit for French Regional Park on Medicine Lake (provided through a Hennepin County AIS Prevention Grant), and providing funding for level II AIS inspectors for French Regional Park.

12. TMDL Implementation Reporting— The EPA approved the Wirth Lake TMDL on October 25, 2010, the Medicine Lake TMDL on February 8, 2011, and the Sweeney Lake TMDL on August 10, 2011. These TMDLs assigned categorical waste load allocations, which means a watershed approach is to be taken in implementing water quality improvement measures in these watersheds. In 2018, the BCWMC will continue tracking the implementation of the Medicine Lake, Sweeney Lake and Wirth Lake TMDLs. The BCWMC role will likely include the following tasks:

- Assisting the cities with reporting on TMDL implementation activities to the MPCA.
- Estimating and reporting progress towards achieving the assigned wasteload allocations. The BCWMC's watershed P8 model, completed in 2013, will be an essential tool for estimating reductions in phosphorus loading.
- Monitoring lake water quality on an annual basis. See “Water Quality” bullet above regarding monitoring of these lakes in 2017.

D. Education and Outreach

The BCWMC will implement its 2018 education and outreach plan (as approved by the Commission). This plan includes financial contributions (and some staff or Commissioner participation in) to the following organizations and programs: Metro WaterShed Partners, River Watch, Citizen Assisted Monitoring Program, Metro Blooms, West Metro Water Alliance (includes staff participation), and the Children’s Water Festival. The plan also includes funding for Commissioner registration fees for training or programs, hosting a sidewalk and parking lot winter maintenance program, and participation in community events such as the Plymouth Home Expo and Golden Valley Arts and Music Festival.

III. Annual Financial Report

The 2017 fiscal year for the Bassett Creek Watershed Management Commission (BCWMC) commenced on February 1, 2017 and ended January 31, 2018.

A. 2017 Approved Budget

The approved operating budget for fiscal year 2017 was \$645,600. Each member's contribution toward the annual budget is based 50 percent on the total area of the municipality within the watershed and 50 percent on the tax capacity of the area within the watershed. A copy of the 2017 operating budget, 2017 revenues, and 2017 member-city assessment table are located in Appendix A.

B. Report of Revenues

See the Financial Audit Report available online at
<http://www.bassettcreekwmo.org/document/annual-report-budget>.

C. Report of Expenditures

See the Financial Audit Report available online at
<http://www.bassettcreekwmo.org/document/annual-report-budget>.

D. Financial Audit Report

The annual audit report for the year ending January 31, 2018, was performed by Malloy Montague Karnowski Radosevich & Co., P.A. A copy of the annual audit report is available online at: <http://www.bassettcreekwmo.org/document/annual-report-budget>.

Appendix A

2017 Financial Information

- 2017 Budget and Notes
- 2017 Expected Revenues
- 2017 Member City Assessments

2017 Operating Budget

Bassett Creek Watershed Management Commission

Item	2014 Budget	2014 Actual	2015 Budget	2015 Actual	2016 Budget	2017 Budget
ENGINEERING & MONITORING						
Technical Services	120,000	109,391	120,000	116,972	120,000	125,000
Development/Project Review s (funded by fees)	65,000	52,643	65,000	51,622	65,000	65,000
Non-fee and Preliminary Review s			15,000	53,686	15,000	15,000
Commission and TAC Meetings	16,000	15,984	14,500	11,525	13,000	14,000
Surveys and Studies	20,000	7,446	20,000	22,109	25,000	20,000
Water Quality / Monitoring	45,000	74,090	63,000	77,429	76,000	74,300
Shoreland Habitat Monitoring					6,000	-
Water Quantity	11,000	12,100	11,500	9,115	11,500	11,500
Assistance on Erosion Control Inspections	1,000	225	1,000		1,000	1,000
Annual Flood Control Project Inspections	20,000	17,031	10,000	9,996	10,000	12,000
Municipal Plan Review	2,000	764	2,000		2,000	8,000
Watershed Outlet Monitoring Program (WOMP)	17,000	13,917	17,000	15,786	17,000	15,500
Annual XP-SWMM Model Updates/Review s						10,000
APM/AIS Work						35,000
Subtotal Engineering & Monitoring	\$317,000	\$303,591	\$339,000	\$368,240	\$361,500	\$406,300
PLANNING						
Watershed-wide XP-SWMM Model (I &II)	0	0	-		-	-
Watershed-wide P8 Water Quality Model	0	0	-		-	-
Next Generation Plan Development	40,000	55,198	30,000	28,277	-	-
Subtotal Planning	\$40,000	\$55,198	\$30,000	\$28,277	\$0	\$0
ADMINISTRATION						
Administrator	60,000	53,917	62,000	59,395	62,000	67,200
Legal	18,500	22,269	18,500	12,969	18,500	18,500
Financial Management	3,045	3,045	3,200	3,200	3,200	3,200
Audit, Insurance & Bond	15,500	12,476	15,500	13,181	15,500	15,500
Digitize Historic Paper Files/Data Management			2,500	-	5,000	-
Meeting Catering Expenses	3,000	1,836	2,500	1,564	2,200	2,000
Admin Services (Rec Sec+Printing+Postage)	35,800	22,763	32,000	29,843	25,000	18,000
Subtotal Administration	\$135,845	\$116,306	\$136,200	\$120,152	\$131,400	\$124,400
OUTREACH & EDUCATION						
Publications / Annual Report	2,000	2,272	4,000	1,430	2,500	2,500
Website	2,000	0	12,000	11,802	3,500	4,400
Demonstration/Education Grants	0	0	-		-	-
Watershed Education Partnerships	15,500	11,100	15,500	10,700	15,500	15,500
Education and Public Outreach	15,000	20,292	17,000	12,830	22,500	20,000
Public Communications	3,000	1,198	3,000	2,270	2,500	2,500
Subtotal Outreach & Education	\$37,500	\$34,862	\$51,500	\$39,032	\$46,500	\$44,900
MAINTENANCE FUNDS						
Erosion/Sediment (Channel Maintenance)	25,000	25,000	25,000	25,000	25,000	25,000
Long-Term Maint. (Flood Control Project)	25,000	25,000	25,000	25,000	25,000	25,000
Subtotal Maintenance Funds	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
TMDL WORK						
TMDL Implementation Reporting	20,000	20,000	20,000	15,881	20,000	20,000
Subtotal TMDL Work	\$20,000	\$20,000	\$20,000	\$15,881	\$20,000	\$20,000
GRAND TOTAL	\$600,345	\$579,957	\$626,700	\$621,582	\$609,400	\$645,600

NOTES - See Budget Detail Document for Further Details				
(A) Majority of costs are covered by review fees				
(B) New line item in 2015 used to cover reviews for which either we do not receive an application fee or it's too early in the process for us to have received an application fee (such as the Blue Line LRT, SWLRT, MnDOT projects, etc.). Through agreements with Met Council, some of these costs are being recovered which are reflected in the income table.				
(C) Engineer attendance at BCWMC meetings and TAC meetings (and Plan Steering Cmte Meetings thru 2015). 2010- 2013 estimates based on 18 meetings. 2014 estimate based on 30 meetings. 2015 estimate based on 24 meetings. 2016 estimated based on 18 meetings (12 BCWMC and 5 TAC). 2017 budget increased to allow for additional BCWMC Engineer staff to attend Commission/TAC meetings (total of 3 assumed).				
(D) For Commission-directed surveys and studies - e.g., past work has included watershed tours, Medicine Lake outlet work, Flood Control Project Maintenance and Responsibilities, etc.				
(E) Several projects including routine monitoring of Sweeney, Twin, and Lost Lakes per BCWMC monitoring plan + first year of two-year study on Sweeney Lake (either on effect of aeration or analyses for alum treatment) + general water quality tasks				
(F) After recommendations from the TAC and Budget Committee, the Commission's ended the erosion and sediment control inspection program (Watershed Inspection) in 2014 due to duplication with activities required by the member cities. Some budget remains here to provide, as requested by the Commission, some oversight of city inspection activities (reports of inspections are available from each city), and for inspecting projects such as County highway and MnDOT projects.				
(G) 2017, 2016 and 2015 budgets include usual inspection. 2017 budget increased to allow for more follow-up with cities, stemming from Flood Control Project Maintenance and Responsibilities-related effort. 2014 budget included inspection of double box culvert (performed once every 5 years).				
(H) 2017 budget assumes review of updated/revised municipal local water plans/official controls likely to come before Commission in 2017. Assume 4 cities at \$2,000 each. This task also includes review of adjacent WMO plan amendments.				
(I) Reimbursed \$5,000 from Met Council. \$15,500 includes \$11,500 for Wenck or similar contractor + \$4,000 for Barr's data management and analyses				
(J) Make updates to XP-SWMM model, coordinate with P8 model updates, assist cities with model use.				
(K) Placeholder for 2017 work that may result from Aquatic Plant Management/Aquatic Invasive Species Committee in 2016.				
(L) Includes hourly rate increase for Administrator from \$67/hour to \$70/hour and increase from 76 hours per month to 80 hours per month.				
(M) Recording Secretary \$62/hr rate * 24 hours/month (10 hours for meeting packets, 1.5 for Facebook posts, 12.5 for website, meeting notices, memo and other writing, filing, and other tasks as assigned)				
(N) Based on 2016 agreement with HDR for website hosting and maintenance activities.				
(O) Includes CAMP (\$5,000), River Watch (\$2,000), Metro Watershed Partners (\$3,500), Metro Blooms (\$3,000), Children's Water Festival (\$350), plus \$1,650 unassigned				
(P) Includes funding for West Metro Water Alliance at \$13,000 plus funding for other educational supplies and materials including educational signage, display materials, Commissioner training, etc.				
(Q) Will be transferred to Channel Maintenance Fund				
(R) Will be transferred to Long-Term Maintenance Fund				
(S) Task includes reporting on TMDL implementation and updating P8 model to include new BMPs.				

2016 Financial Information		
Fund Balance as of January 31, 2016 (audited)	\$	355,506
Expected income from assessments in 2016	+	\$ 490,345
Expected interest income in 2016	+	\$ -
Expected income from project review fees	+	\$ 60,000
Expected income from CIP Administrative Funds	+	\$ 17,055
Expected transfer from Long-term Maint Fund for Flood Control	+	\$ 10,000
Expected income from WOMP reimbursement	+	\$ 5,000
Expected income from reimbursements from 2015/2016 work ¹	+	\$ 38,900
Estimated funds available for fiscal year 2016	\$	976,806
Estimated expenditures for fiscal year 2016	-	\$ 609,400
Estimated fund balance as of January 31, 2017	\$	367,406

¹ \$31,331 = 2015 work already invoiced; + \$2,600 expected for Southwest LRT; + \$5,000 expected for Blue Line LRT

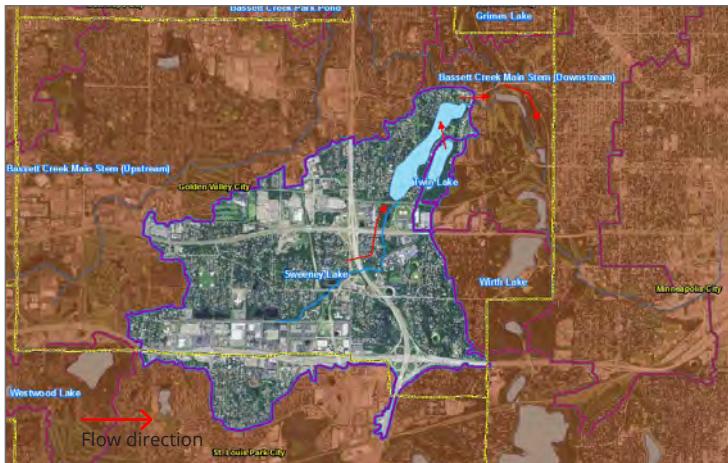
2017 Revenues		
Expected Income		
Proposed Assessments to cities	+	\$ 500,000
Use of fund balance	+	\$ 35,528
CIP Administrative Funds (2.0% of requested levy of \$1.303M)	+	\$ 26,072
Project review fees	+	\$ 60,000
Transfer from Long-term Maint Fund for Flood Control Proj Inspection	+	\$ 12,000
WOMP reimbursement	+	\$ 5,000
Expected reimbursement for Blue Line LRT work	+	\$ 7,000
Interest income in 2017	+	\$ -
	\$	645,600
Expected Expenses		
Total operating budget	\$	645,600
Fund Balance Details		
Est. Beginning Fund Balance (Jan 31, 2017)	\$	367,406
Use of Fund Balance (see income above)	-	\$ 35,528
Est. Remaining Fund Balance (Jan 31, 2017)	\$	331,878

Bassett Creek Watershed Management Commission
2017 Assessments

Community	For Taxes Payable in 2016	2016 Percent	Current Area Watershed	Percent	Average	2012 Assessment	2013 Assessment	2014 Assessment	2015 Assessment	2016 Assessment	2017 Assessment
	Net Tax Capacity	of Valuation	in Acres	of Area	Percent	\$461,045	\$515,016	\$490,345	\$490,345	\$490,345	\$500,000
Crystal	\$7,109,951	5.19	1,264	5.09	5.14	\$24,941	\$27,424	\$25,504	\$25,868	\$25,771	\$25,704
Golden Valley	\$35,429,799	25.88	6,615	26.63	26.25	\$115,080	\$129,126	\$123,033	\$121,964	\$127,675	\$131,270
Medicine Lake	\$853,126	0.62	199	0.80	0.71	\$3,484	\$3,909	\$3,479	\$3,543	\$3,600	\$3,561
Minneapolis	\$9,091,000	6.64	1,690	6.80	6.72	\$32,661	\$35,236	\$32,953	\$33,235	\$32,885	\$33,609
Minnetonka	\$9,335,597	6.82	1,108	4.46	5.64	\$24,920	\$28,464	\$27,402	\$28,121	\$27,536	\$28,199
New Hope	\$7,292,580	5.33	1,252	5.04	5.18	\$25,533	\$27,648	\$26,479	\$25,681	\$25,627	\$25,917
Plymouth	\$58,928,879	43.05	11,618	46.77	44.91	\$209,101	\$235,310	\$224,959	\$225,159	\$220,974	\$224,531
Robbinsdale	\$2,340,788	1.71	345	1.39	1.55	\$8,022	\$8,479	\$7,743	\$7,587	\$7,843	\$7,747
St. Louis Park	\$6,513,847	4.76	752	3.03	3.89	\$17,303	\$19,420	\$18,792	\$19,184	\$18,433	\$19,463
TOTAL	\$136,895,567	100.00	24,843	100.00	100.00	\$461,045	\$515,045	\$490,345	\$490,345	\$490,345	\$500,000

Appendix B
2017 Lake Monitoring Reports

Sweeney Lake 2017 water quality monitoring



About Sweeney Lake

BCWMC classification	Priority-1 deep lake
Watershed area	2,397 acres
Lake size	67 acres
Average depth	12 feet
Maximum depth	25 feet
Ordinary high water level	827.7 feet
Normal water level	827.2 feet
Downstream receiving waterbody	Bassett Creek
Location (city)	Golden Valley
MPCA impairments	Nutrients, chloride
Aquatic invasive species	Curly-leaf pondweed
Public access	Yes (boat launch)

Monitoring water quality in Sweeney Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes and six ponds since 1972. This monitoring is done to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality. A summary of 2017 monitoring efforts on Sweeney Lake is provided below; more comprehensive information can be found on pages 2-7.

At a glance: 2017 monitoring results

In 2017, the BCWMC monitored Sweeney Lake for:

- Water chemistry (nutrients, chlorophyll a, chloride).
- Water measurements (e.g., clarity, dissolved oxygen).
- Phytoplankton and zooplankton (microscopic aquatic plants and animals).
- Macrophytes (aquatic plants).

Results indicate that, overall, Sweeney Lake does not meet applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for total phosphorus and chlorophyll a. Trend analyses indicate no trends in total phosphorus, chlorophyll a, or Secchi depth over the past 20 years.

Recommendations

- Implement management measures to reduce the internal phosphorus load from sediment (about one-third of the lake's annual phosphorus load). Alum treatment would reduce internal phosphorus load from sediment and improve water quality.
- Continue implementation of Sweeney Lake TMDL, including best management practices and capital improvement projects to reduce watershed nutrient loads.
- Reduce winter/spring chloride loads to Sweeney Lake through road salt management initiatives. Identify and target directly connected impervious areas and other potential locations in watershed that may be contributing high chloride loads.
- Continue water quality and biological monitoring.
- Further investigate possible trends/shifts in the vegetation community and the lower plant IBI scores observed in 2017.

Water chemistry monitoring: 2017

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, excessive levels lead to excessive growth, decreased water clarity, and water quality impairment.

- BCWMC/MPCA standard: 40 micrograms per liter ($\mu\text{g/L}$) or less.
- Range: Total phosphorus concentrations for Sweeney Lake were in the eutrophic category from mid-May to early September. The low was 16 $\mu\text{g/L}$ in April (North Basin), and the high was 49 $\mu\text{g/L}$ (South Basin) in July.
- Summer average: 39 $\mu\text{g/L}$ in the North Basin (met BCWMC/MPCA standard) and 46 $\mu\text{g/L}$ in the South Basin (did not meet BCWMC/MPCA standard).

Chlorophyll *a* levels

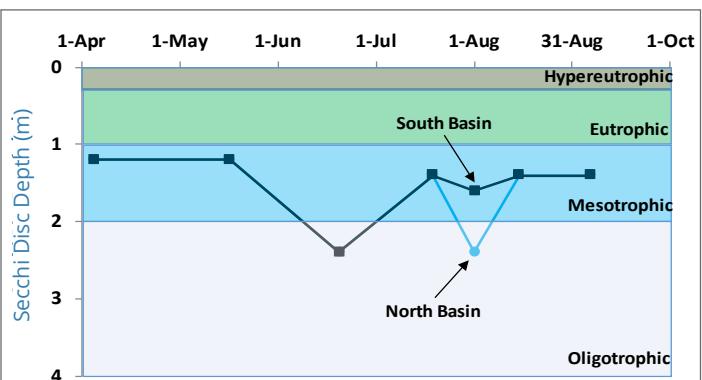
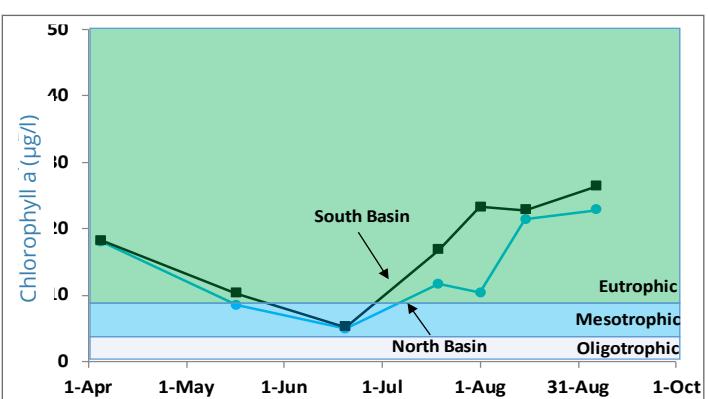
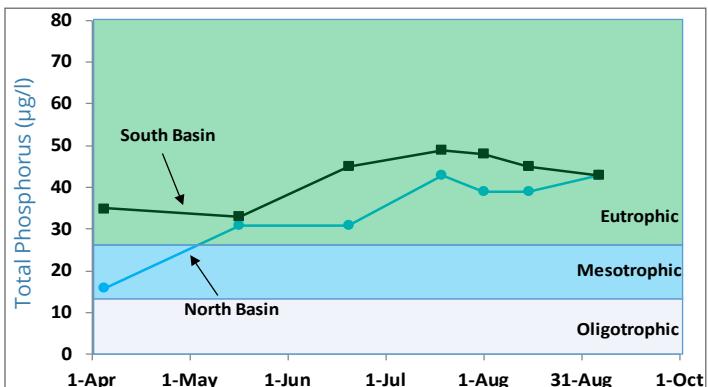
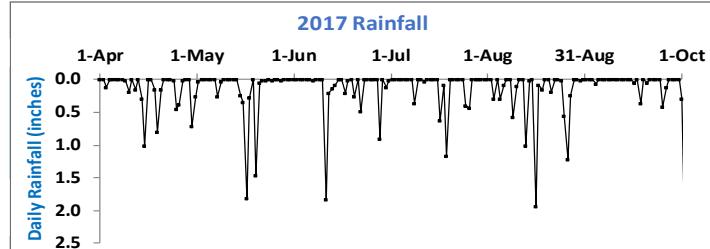
Chlorophyll *a* is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll *a* levels less than 15 $\mu\text{g/L}$.

- BCWMC/MPCA standard: 14 micrograms per liter ($\mu\text{g/L}$) or less.
- Range: Chlorophyll *a* concentrations ranged from a low of 5 $\mu\text{g/L}$ in June (North Basin) to a high of 26 $\mu\text{g/L}$ (South Basin) in September. Concentrations for both basins were in the eutrophic range for all sample events except for the mid-June event.
- Summer average: 14 $\mu\text{g/L}$ in the Upper Basin (met BCWMC/MPCA standard) and 19 $\mu\text{g/L}$ in the South Basin (did not meet BCWMC/MPCA standard).

Water clarity

Water clarity is often affected by the abundance of algae or other photosynthetic organisms in a lake. It is usually measured by lowering an 8-inch "Secchi" disc into the lake; the depth at which the disc's alternating black-and-white pattern is no longer visible is considered a measure of the water's transparency.

- BCWMC/MPCA standard: 1.4 meters or more.
- Range: Secchi disc depth ranged from 1.2 meters (both basins) in April/May to 2.4 meters (both basins) during the mid-June sample event.
- Summer average: 1.8 meters in the North Basin and 1.6 meters in the South Basin both met BCWMC/MPCA standard.



Definitions

- Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low transparency
- Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- Oligotrophic:** Lake condition characterized by a low level of dissolved nutrients, high oxygen content, and sparse algae growth



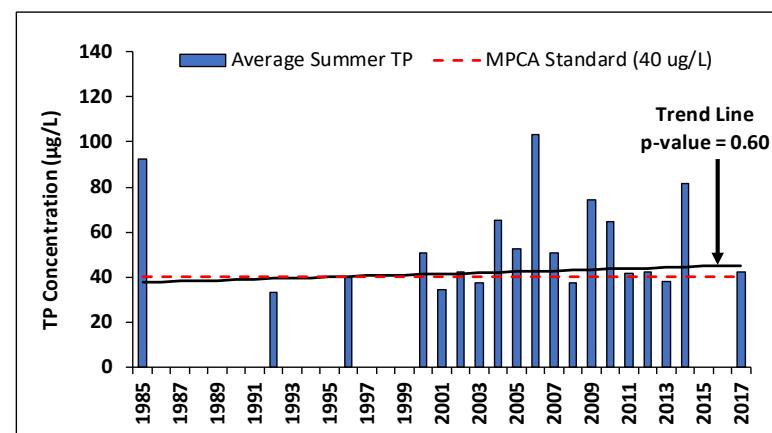
Photo credit: Jane McDonald Black

Water chemistry monitoring from 1985–2017: historical trends

Water quality in Sweeney Lake has been monitored since 1985. Total phosphorus, chlorophyll a, and Secchi disc transparency summer averages (June through September) for years with a minimum of four sample events are shown in the figures to the right. Since 1985, summer averages have not met BCWMC/MPCA standards 74% of the time for total phosphorus, 63% of the time for chlorophyll a, and 42% of the time for Secchi depth. Trend analyses for Sweeney Lake suggests the trend lines presented in the figures to the right are not statistically significant (p-values all greater than 0.05).

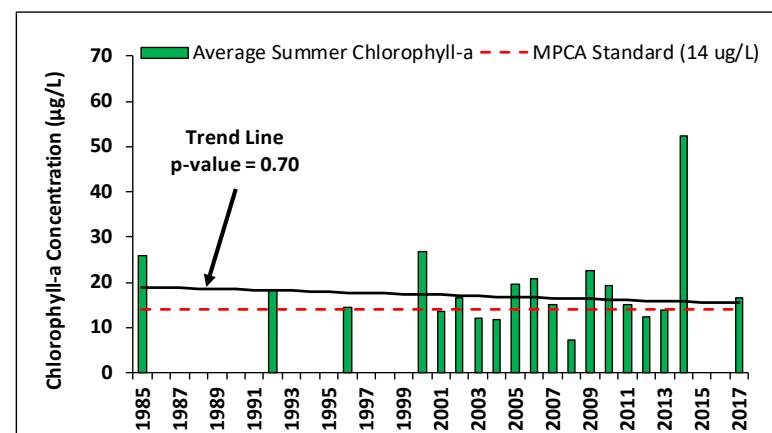
Total phosphorus trends

Note: Graphs and trend lines do not include CAMP data



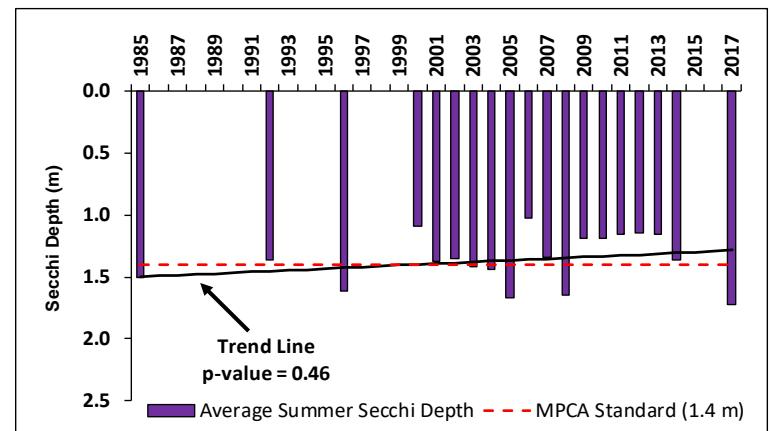
Chlorophyll a trends

Note: Graphs and trend lines do not include CAMP data



Water clarity trends

Note: Graphs and trend lines do not include CAMP data



Phosphorus loading from sediment (2017)

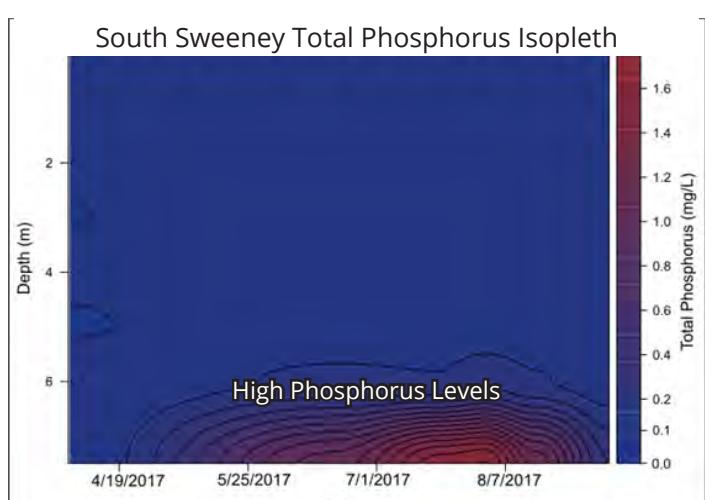
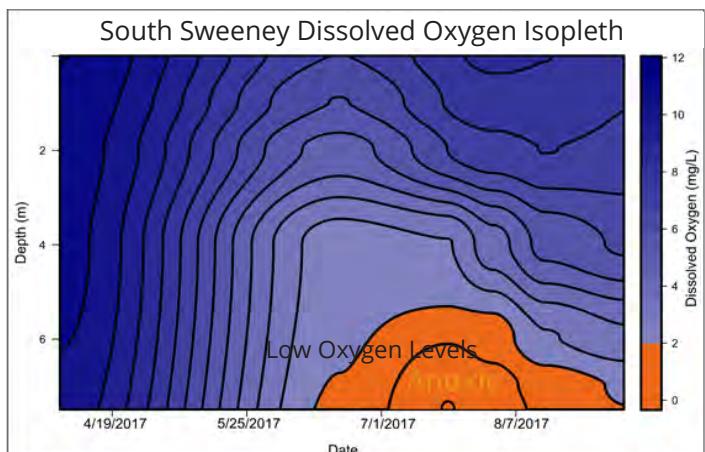
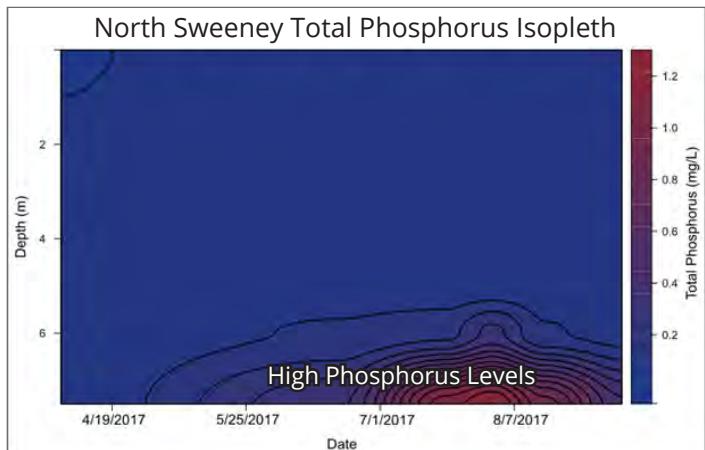
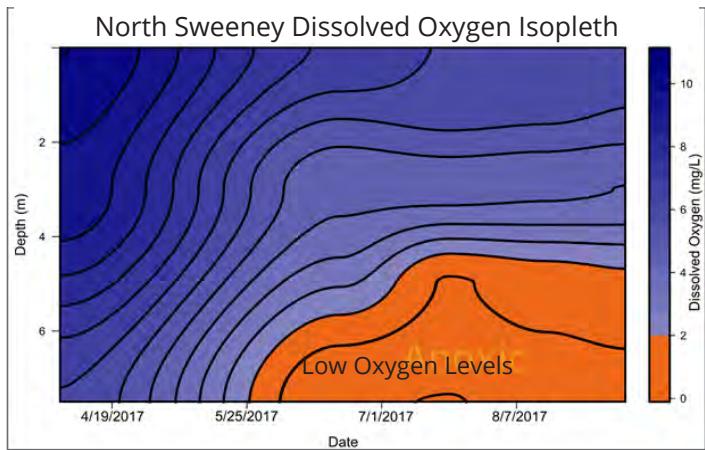
The release of phosphorus stored in lake-bottom sediments when oxygen levels are low is described as “internal phosphorus loading from sediment.” The Sweeney Lake total maximum daily load (TMDL) study (SEH 2011) found internal phosphorus loading from sediment to be a significant source of lake phosphorus—about one-third of the lake’s total annual phosphorus load. According to the study, phosphorus from Sweeney Lake’s sediment is conveyed to the surface by diffusion, wind mixing, and mixing by the aeration system when it is operated.

The aerators were not operated in Sweeney Lake during the 2017 sampling season. The 2017 data indicate near-bottom oxygen levels in the North Basin was low from late May through September and in the South Basin from mid-June to early September. Internal phosphorus loading from sediment during this period caused near-bottom phosphorus concentrations to increase consistently; this was correlated with increasing phosphorus concentrations in surface water. Temperature and dissolved oxygen data indicate that oxygen levels in the South Basin began to increase as the water column began mixing with the surface layer in early August. In the North Basin, late summer mixing between the surface and deep water was not as pronounced as the water column remained more stratified throughout the entire sampling period.

Chloride levels in 2017

Chloride present in deicing chemicals applied to streets and parking lots in the Sweeney Lake watershed is conveyed to the lake by snowmelt and rainfall runoff. Excessive chloride concentrations have been linked to decreased biodiversity in water bodies. Sweeney Lake was placed on the State’s 303(d) list of impaired waters in 2014 for chloride.

- According to MPCA assessment protocol, a lake is considered impaired for chloride if two or more exceedances of the chronic exposure standard (230 mg/l) are recorded within a three year period
- Range: Concentrations in the North Basin ranged from 289 mg/L in early April to 152 mg/L in early September; concentrations in the South Basin ranged from 287 mg/L in early April to 143 mg/L in early September.
- Only one of the six samples (early April) collected in the North and South Basins in 2017 exceeded the MPCA 230 mg/L chronic standard.



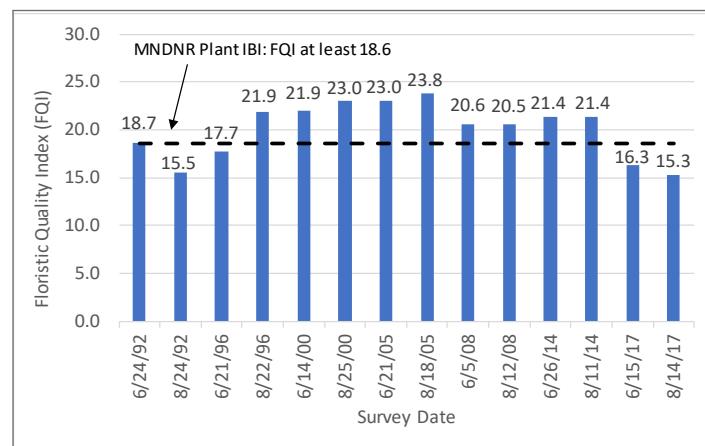
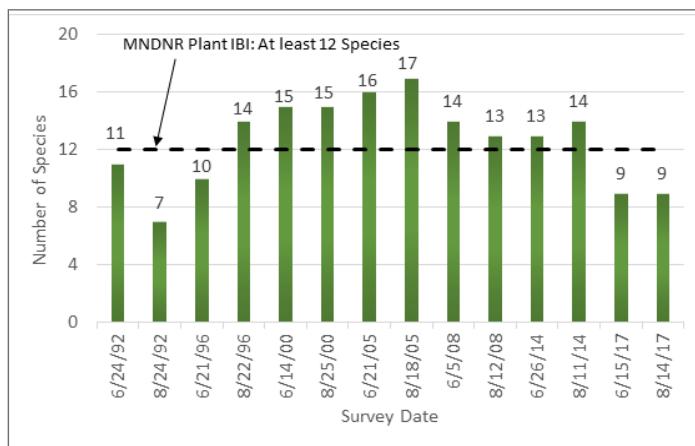
Macrophytes (aquatic plants)

Lake Plant Eutrophication Index of Biological Integrity (IBI)

The Minnesota Department of Natural Resources (MDNR) recently developed metrics to determine the overall health of a lake's aquatic plant community. The Lake Plant Eutrophication Index of Biological Integrity (IBI) is used by the MPCA to determine whether a lake is meeting the federal Clean Water Act standards intended to protect aquatic life. The plant IBI includes two metrics: (1) the number of species in a lake and (2) the "quality" of the species, as measured by the floristic quality index (FQI).

Sweeney Lake plant survey data from 1992 through 2017 were assessed to determine plant IBI. The figures below show the number of species and FQI for that period compared to the MDNR plant IBI impairment threshold. During the period examined, the number of species in Sweeney Lake has ranged from 9 to 17, exceeding the impairment threshold of at least 12 species in 9 of the 14 survey events. FQI values ranged from 15.3 to 23.8, and the lake has met or exceeded the impairment threshold (18.6 minimum) in 10 of the 14 survey events since 1992. In general, the number of species and FQI scores for 2017 were lower than other survey efforts since 2000. Below are a few factors that may have led to the lower 2017 scores:

- During the 2014 surveys, there were 9 species that were observed at less than 5% of the sample points. Of these 9 species, only 4 were observed during the 2017 surveys.
- Surveys prior to 2017 noted two different duckweed and one watermeal species. The 2017 surveys only noted one duckweed and no watermeal species.
- Waterlilies (yellow and white) were observed at significantly more sample points (yellow = 16%; white = 38%) during the 2017 surveys compared to the 2014 surveys (yellow = 2%; white = 22%). Waterlilies, when present in high densities, have the potential to shade and limit light penetration to submerged aquatic vegetation species.



Aquatic invasive species

In 2017, one aquatic invasive species was observed in Sweeney Lake, curly-leaf pondweed. Curly-leaf pondweed in Sweeney Lake was first noted during the 1992 vegetation surveys. In 2017, curly-leaf pondweed was noted at approximately 12% of the sample points during the June survey.



Microscopic plants and animals

Phytoplankton in 2017

Samples of phytoplankton, microscopic aquatic plants, were collected from Sweeney Lake in 2017 to evaluate water quality, determine the quality of food available to the lake's zooplankton (microscopic animals), and estimate the public health risk posed by blue-green algae, which produce toxins.

In general, phytoplankton numbers followed a pattern similar to chlorophyll a, increasing from June through early August and decreasing in late August and September. As shown in the figures on page 7, blue-green algae, a poor food source for zooplankton, were dominant in both basins throughout the 2017 monitoring season.

Sweeney Lake is subject to significant "internal phosphorus loading" during the summer, meaning that phosphorus from the lake's sediment is released to the surface water. This increase in phosphorus encourages phytoplankton growth, particularly blue-green algae.

Blue-green algae can produce natural toxins; in high concentrations, these toxins can be harmful to pet and human health. The World Health Organization (WHO) has established the following guidelines for assessing the risk posed to lake users by exposure to blue-green algae.

- Lakes with blue-green algae densities less than 20,000 cells per milliliter pose no risk to the health of humans or pets.
- Exposure to lakes with blue-green algae density levels between 20,000 and 100,000 cells per milliliter poses a low risk of adverse health impacts (i.e., skin irritation or allergenic effects such as watery eyes).
- Exposure to lakes with blue-green algae densities greater than 100,000 cells per milliliter poses a moderate health risk (i.e., long-term illness from algal toxins is possible).

In 2017, blue-green algae numbers were in the moderate risk category in both basins from mid-June through early September. As noted, higher blue-green algae concentrations correlated with increasing surface water phosphorus concentrations. It should also be pointed out that the South Basin had higher surface phosphorus and blue-green algae

concentrations than the North Basin throughout most of the summer in 2017.

Zooplankton in 2017

The size and composition of the lake's zooplankton community, as illustrated by the figures on page 7, was consistent with previous years. All three groups of zooplankton (rotifers, copepods, and cladocerans) were represented; however, small rotifers and copepods (which have limited impact on the lake's water quality) generally dominated.

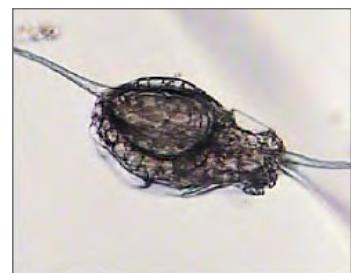
The zooplankton data illustrate the interconnectedness of a lake's food web and its water quality. Of particular interest in 2017 were the large-bodied cladoceran.

The numbers of these zooplankton increased from April through mid-June, then declined and remained at relatively low levels throughout the remainder of the summer. The mid-June peak in cladoceran abundance correlated with the lowest chlorophyll a concentration and highest Secchi disc depth (i.e., better water quality) measurement of the summer growing season. This is because the large-bodied zooplankton graze on algae.

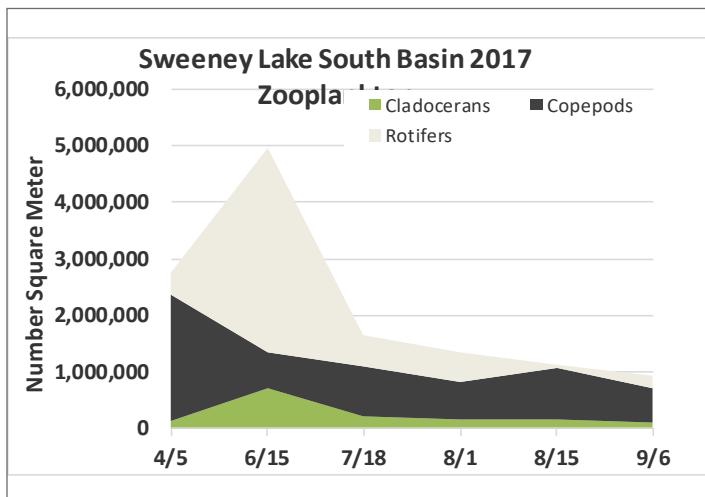
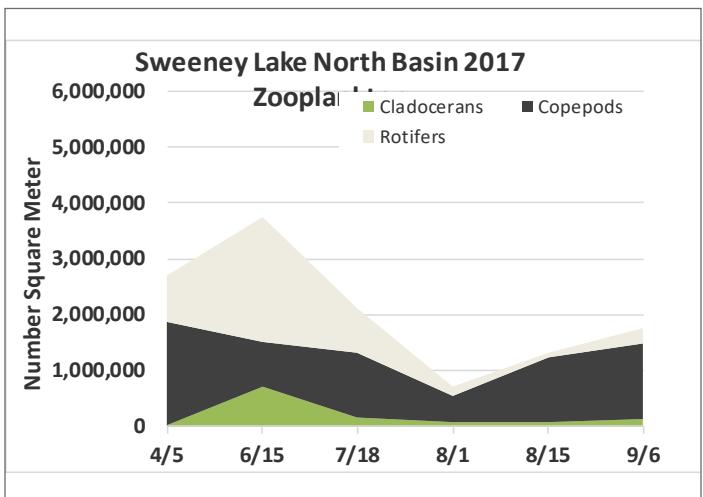
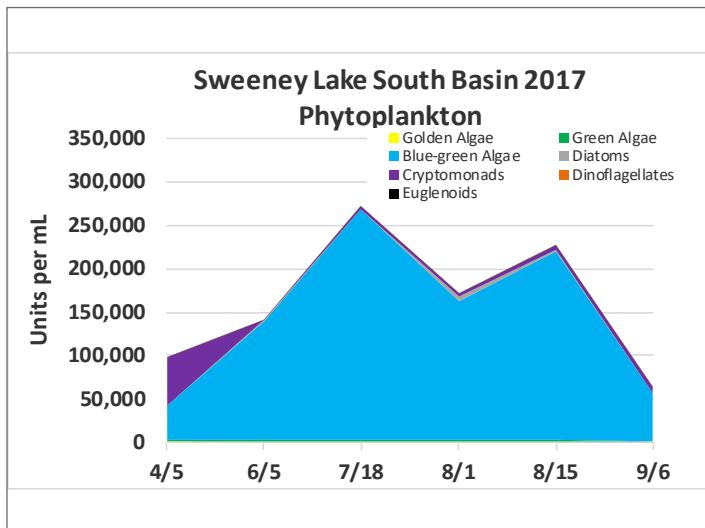
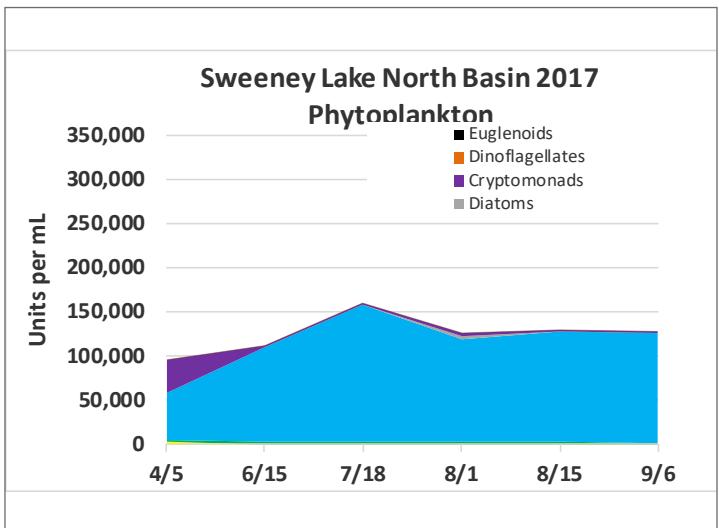
While large-bodied cladoceran can improve lake water quality, fish predation limits their impact much of the summer. Another limiting factor is the predominance of blue-green algae, a poor food source for zooplankton.

The importance of monitoring

Both the phytoplankton and zooplankton data affirm the importance of reducing phosphorus loading to the lake to prevent increases in blue-green algae. The data also highlights the importance of monitoring the phytoplankton community to ensure that blue-green algae density levels do not threaten the health of lake users.

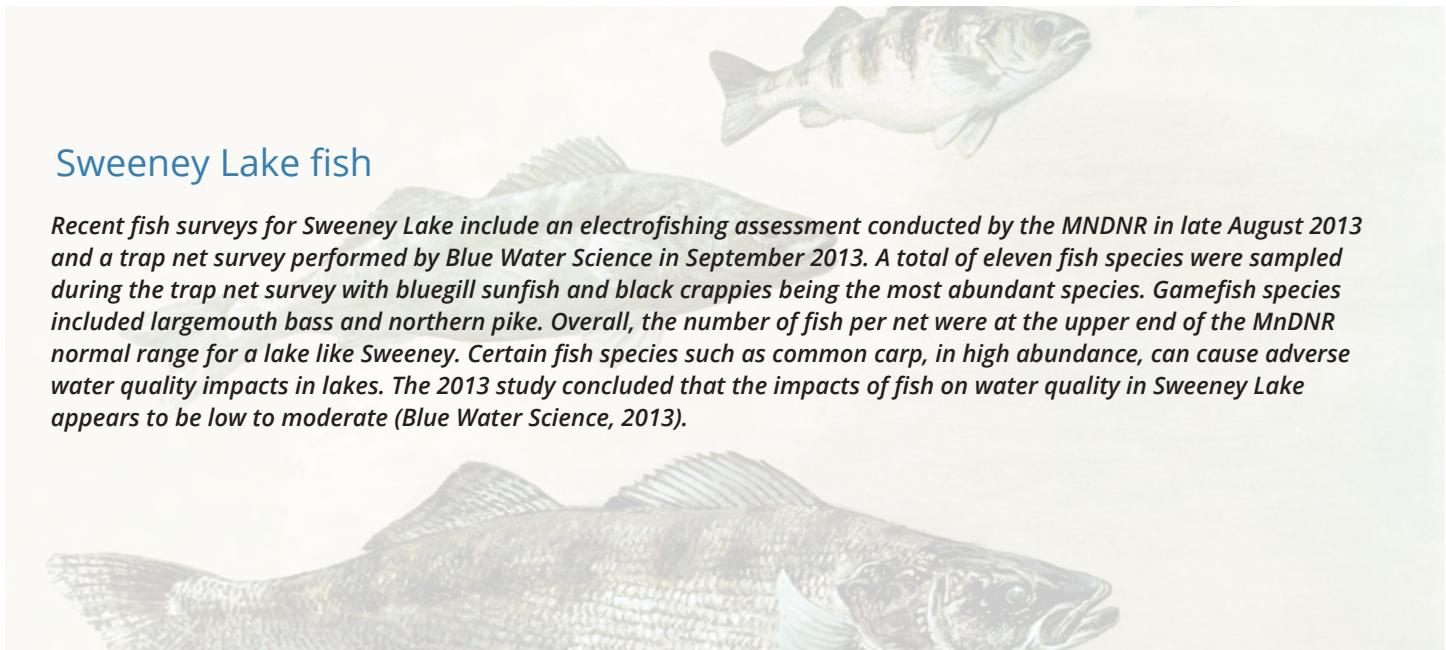


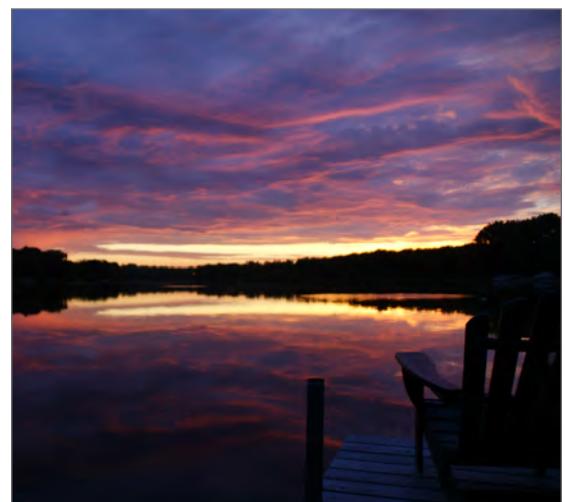
Above: Left—Chlamydomonas, a type of green algae found in Sweeney Lake. Right—Filiinia longiseta, a rotifer found in Sweeney Lake; the phytoplankton and zooplankton communities in Sweeney Lake are represented in the figures on page 7.



Sweeney Lake fish

Recent fish surveys for Sweeney Lake include an electrofishing assessment conducted by the MNDNR in late August 2013 and a trap net survey performed by Blue Water Science in September 2013. A total of eleven fish species were sampled during the trap net survey with bluegill sunfish and black crappies being the most abundant species. Gamefish species included largemouth bass and northern pike. Overall, the number of fish per net were at the upper end of the MnDNR normal range for a lake like Sweeney. Certain fish species such as common carp, in high abundance, can cause adverse water quality impacts in lakes. The 2013 study concluded that the impacts of fish on water quality in Sweeney Lake appears to be low to moderate (Blue Water Science, 2013).





Bassett Creek Watershed Management Commission
952.270.1990
bassettcreekwmo.org

Photo credit: Jane McDonald Black

Cleaner, healthier water for a growing community

Twin Lake 2017 water quality monitoring



About Twin Lake

BCWMC classification	Priority-1 deep lake
Watershed area	131 acres
Lake size	21 acres
Average depth	26 feet
Maximum depth	56 feet
Ordinary high water level	831.9 feet
Normal water level	827.2 feet
Downstream receiving waterbody	Sweeney Lake
Location (city)	Golden Valley
MPCA impairments	None
Aquatic invasive species	Curly-leaf pondweed
Public access	Yes (parkland)

Monitoring water quality in Twin Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes and six ponds since 1972. This monitoring is done to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality. A summary of 2017 monitoring efforts on Twin Lake is provided below; more comprehensive information can be found on pages 2-7

At a glance: 2017 monitoring results

In 2017, the BCWMC monitored Twin Lake for:

- Water chemistry (nutrients, chlorophyll a, chloride).
- Water measurements (e.g., clarity, dissolved oxygen).
- Phytoplankton and zooplankton (microscopic plants and animals).
- Macrophytes (aquatic plants).

Results of 2017 monitoring show that Twin Lake met applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for lakes and the long-term data suggests the lake has generally maintained good water quality conditions over the past 20 years. In addition, the plant community currently meets the Minnesota Department of Natural Resources (MDNR) plant index of biotic integrity (IBI) standards (see page 5).

Recommendations

- Continue water quality and biological monitoring.
- Evaluate effectiveness of first aluminum sulfate (alum) treatment (2015), and proceed with 2nd treatment
- Continue to implement best management practices and capital improvement projects in the lake's watershed.

Water chemistry monitoring: 2017

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, excessive phosphorus leads to excessive growth, decreased water clarity, and water quality impairment.

- BCWMC/MPCA standard: 40 micrograms per liter ($\mu\text{g/L}$) or less.
- Range: Total phosphorus concentrations ranged from a low of 15 $\mu\text{g/L}$ in April to a high of 22 $\mu\text{g/L}$ in May. All concentrations were within the mesotrophic category (moderate nutrient content).
- Summer average: 16 $\mu\text{g/L}$ (met BCWMC/MPCA standard).

Chlorophyll a levels

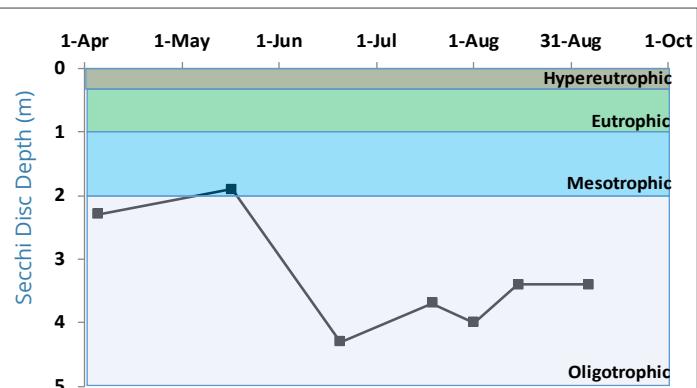
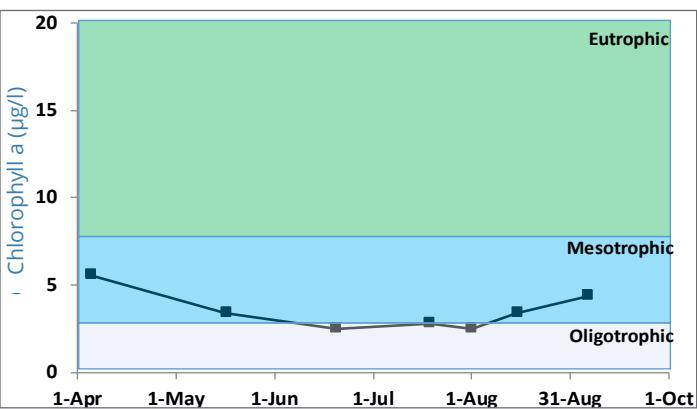
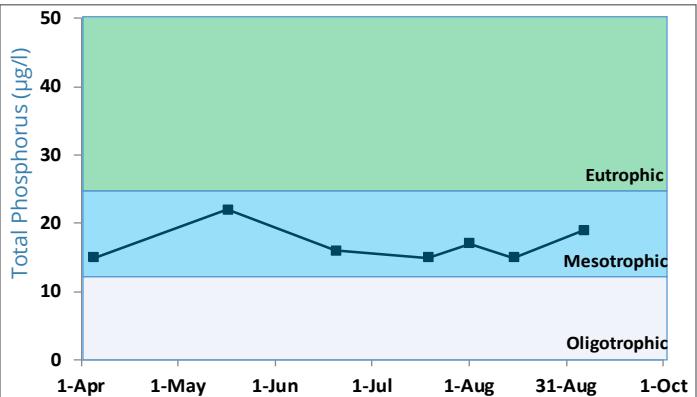
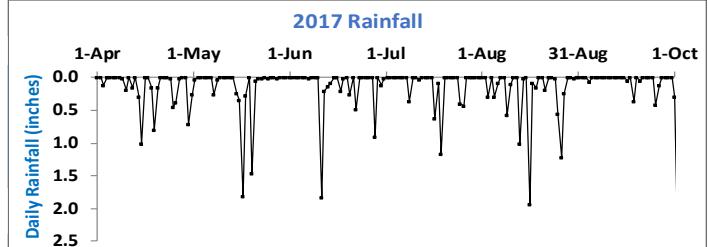
Chlorophyll a is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll a levels less than 15 micrograms per liter ($\mu\text{g/L}$).

- BCWMC/MPCA standard: 14 $\mu\text{g/L}$ or less.
- Range: Chlorophyll a concentrations ranged from a low of 2.5 $\mu\text{g/L}$ in June to a high of 5.6 $\mu\text{g/L}$ in April. Throughout 2017, chlorophyll a concentrations were in the mesotrophic or oligotrophic category, indicating good water quality conditions.
- Summer average: 3.1 $\mu\text{g/L}$ (met BCWMC/MPCA standard).

Water clarity

Water clarity is often affected by sediment and the amount of algae or other photosynthetic organisms in a lake. It is usually measured by lowering an 8-inch "Secchi" disc into the lake; the depth at which the disc's alternating black-and-white pattern is no longer visible is considered a measure of the water's transparency.

- BCWMC/MPCA standard: 1.4 meters or more..
- Range: From 4.3 meters in June to 1.9 meters in May.
- Summer average: 3.8 meters (met BCWMC/MPCA standard).



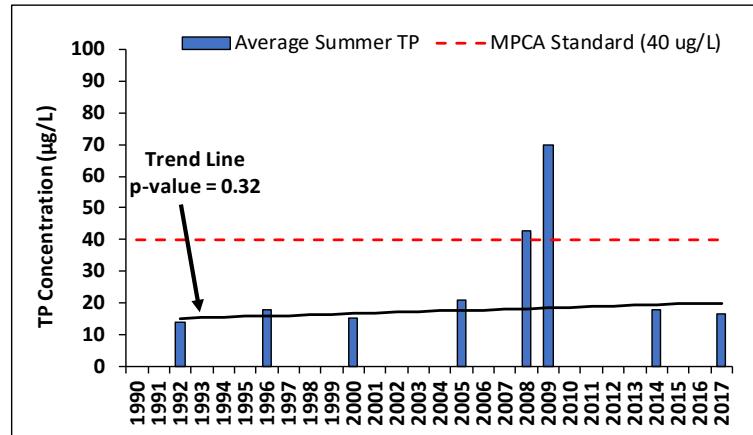
Definitions

- Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low transparency
- Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- Oligotrophic:** Lake condition characterized by a low level of dissolved nutrients, high oxygen content, and sparse algae growth



Total phosphorus trends

Note: Graphs and trend lines do not include CAMP data



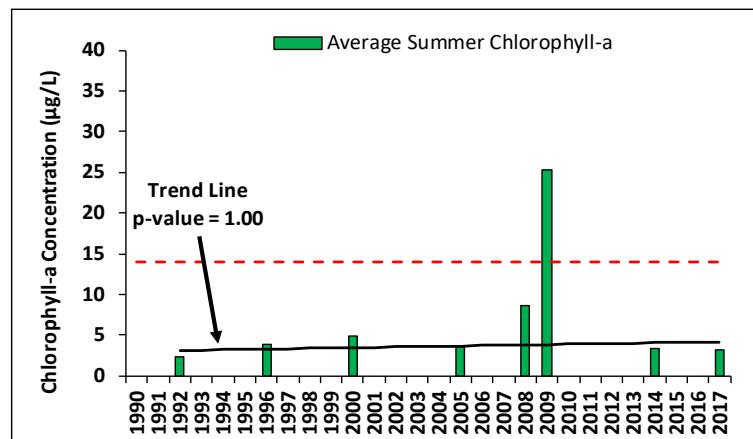
Water chemistry monitoring from 1992–2017: historical trends

Water quality in Twin Lake has been monitored since 1992. Total phosphorus, chlorophyll a, and Secchi disc transparency summer averages (June through September) for years with a minimum of four sample events are shown in the figures to the right. Summer averages for phosphorus have met BCWMC/MPCA standards in 6 of the 8 years monitored since 1992. Chlorophyll a concentrations and Secchi disc depth have meet the standard in 7 of the 8 monitored years. Trend analyses for Twin Lake suggests the trend lines presented in the figures to the right are not statistically significant (p-values all greater than 0.05).

Water quality in Twin Lake showed improved conditions in 2017 following the 2015 alum treatment and it is expected that water quality will continue to improve. It is recommended that the Commission continue monitoring water quality in Twin Lake over the next few years to evaluate the effectiveness of the 2015 alum treatment.

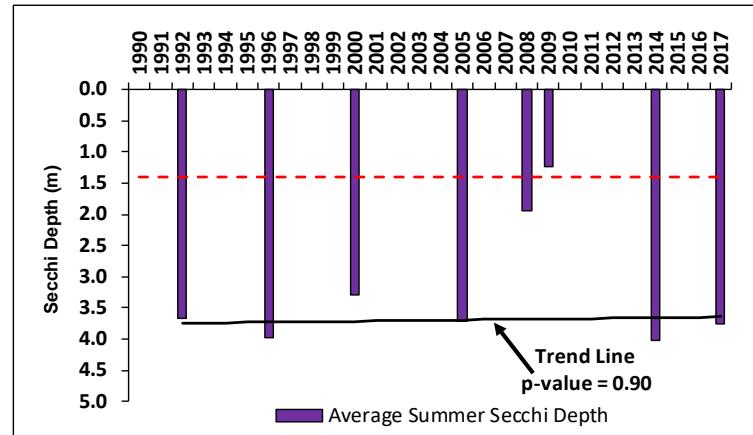
Chlorophyll a trends

Note: Graphs and trend lines do not include CAMP data



Water clarity trends

Note: Graphs and trend lines do not include CAMP data

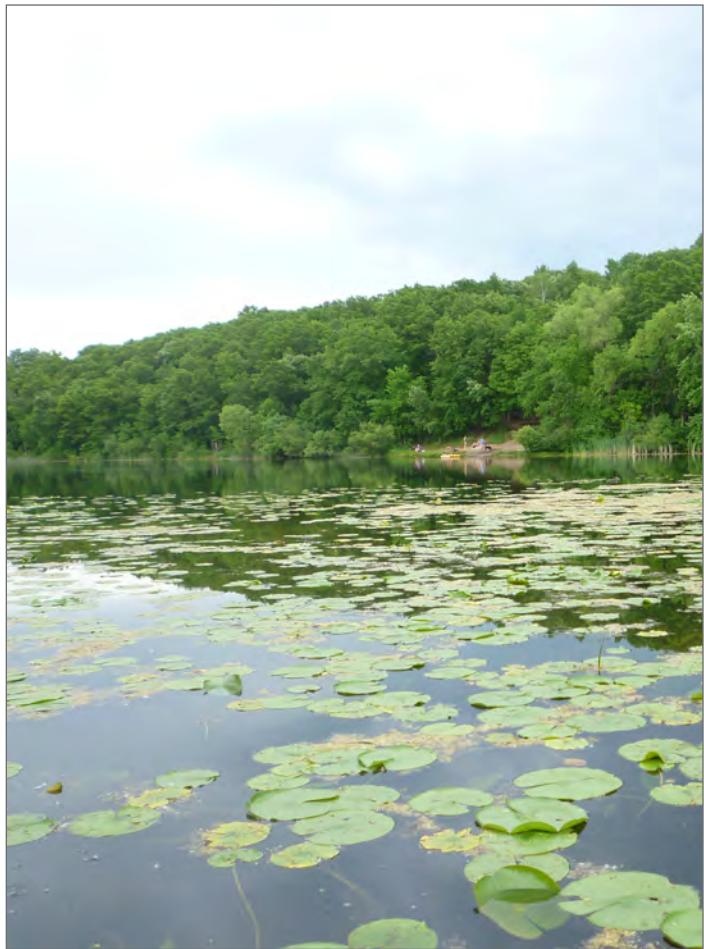
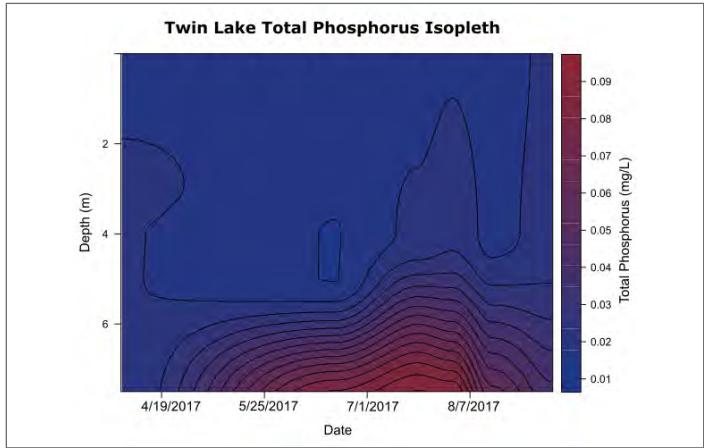
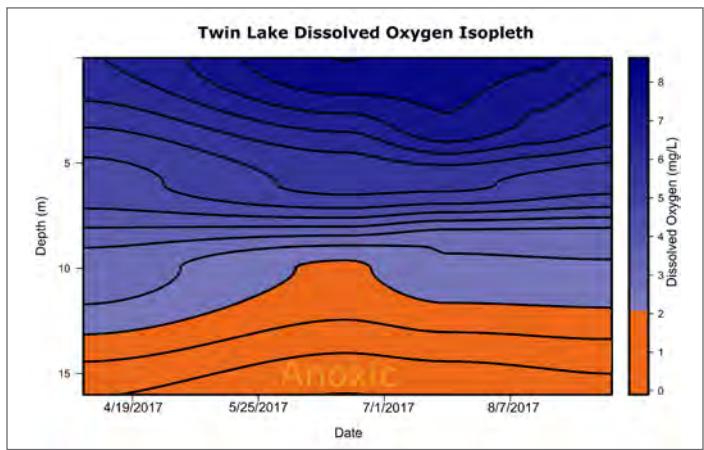


Phosphorus loading from sediment (2017)

The release of phosphorus stored in lake-bottom sediments when oxygen levels are low is described as "internal phosphorus loading from sediment." A feasibility study for Twin Lake (Barr, 2013) and previous monitoring data and analysis (Barr, 2015) found internal phosphorus loading from sediment to be a significant source of lake phosphorus in Twin Lake. According to these studies, phosphorus diffuses out of the lake's sediments and is conveyed to surface waters through weakening of the thermocline and/or wind-mixing events. In order to reduce the diffusive flux of phosphorus from the sediment, an aluminum sulfate (alum) treatment was conducted on Twin Lake in May 2015. The alum treatment is expected to maintain Twin Lake's water quality for 20 to 30 years or longer.

Prior to the alum treatment, average hypolimnetic (deep water) phosphorus concentrations in Twin Lake ranged from a low of approximately 250 µg/L in the early 1980s to a high of approximately 1,200 µg/L in 2014 (Barr, 2015). The 2017 monitoring data indicate that the average hypolimnetic phosphorus concentration was significantly lower (~150 µg/L) than pre-treatment concentrations. These results suggest the Twin Lake alum treatment is currently working and has successfully reduced hypolimnetic and surface water phosphorus concentrations in Twin Lake. However, water quality may not tell the entire internal loading story for Twin Lake.

An important nuance of alum treatments is differentiating between water quality improvements and reductions in sediment phosphorus release. Obviously, total phosphorus reductions in the surface water and hypolimnion indicate that the initial alum half-dose has reduced phosphorus release from sediments in the near term. However, short term water quality improvements may not be an indicator that the mobile phosphorus pool in Twin Lake sediments has been sufficiently reduced. Many times, even in the case of lakes that did not receive enough alum, water quality improvements are observed over a short time period (1-5 years). Recent scientific literature suggest that follow up sediment coring after alum treatments has provided critical information on the amount of mobile phosphorus in sediments that has been inactivated. The commission collected sediment cones for Twin Lake following the 2015 alum treatment and will be using the results of this analysis to determine how to proceed with the second treatment.



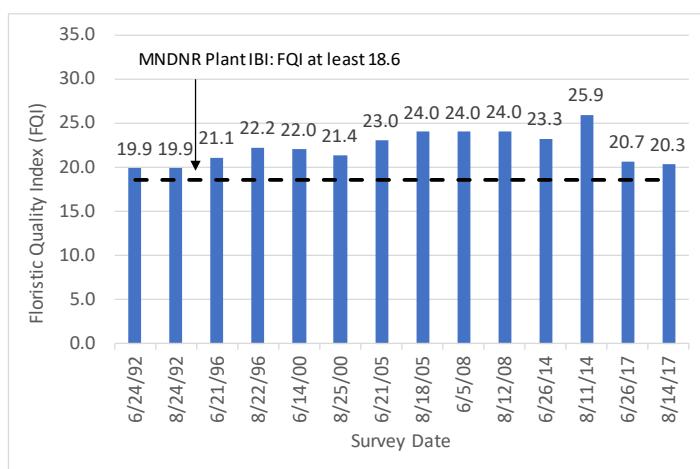
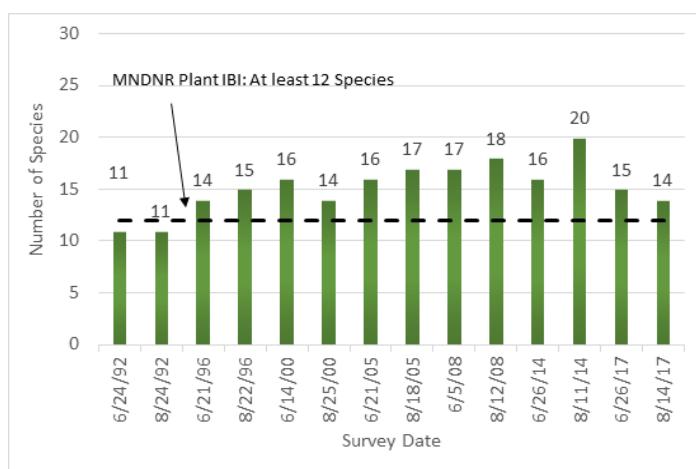
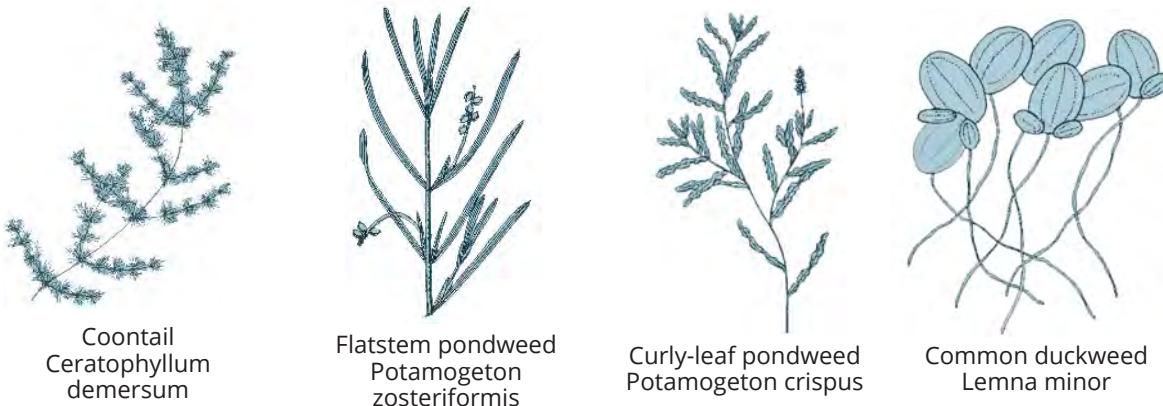
Macrophytes

Lake Plant Eutrophication Index of Biological Integrity (IBI)

The Minnesota Department of Natural Resources (MDNR) recently developed metrics to determine the overall health of a lake's aquatic plant community. The Lake Plant Eutrophication Index of Biological Integrity (IBI) is used by the MPCA to determine whether a lake is meeting the federal Clean Water Act standards intended to protect aquatic life. The plant IBI includes two metrics: (1) the number of species in a lake and (2) the "quality" of the species, as measured by the floristic quality index (FQI).

Twin Lake plant survey data from 1992 through 2017 were assessed to determine plant IBI. The figures below show the number of species and FQI for that period compared to the MDNR plant IBI impairment threshold. During the period examined, the number of species in Twin Lake has ranged from 11 to 20, exceeding the impairment threshold of at least 12 species for the majority of the surveys. FQI values ranged from 19.9 to 25.9, which also exceeds the impairment threshold (18.6 minimum). This means that Twin Lake is not considered impaired in terms of its ability to support aquatic plant life.

Commonly found aquatic species

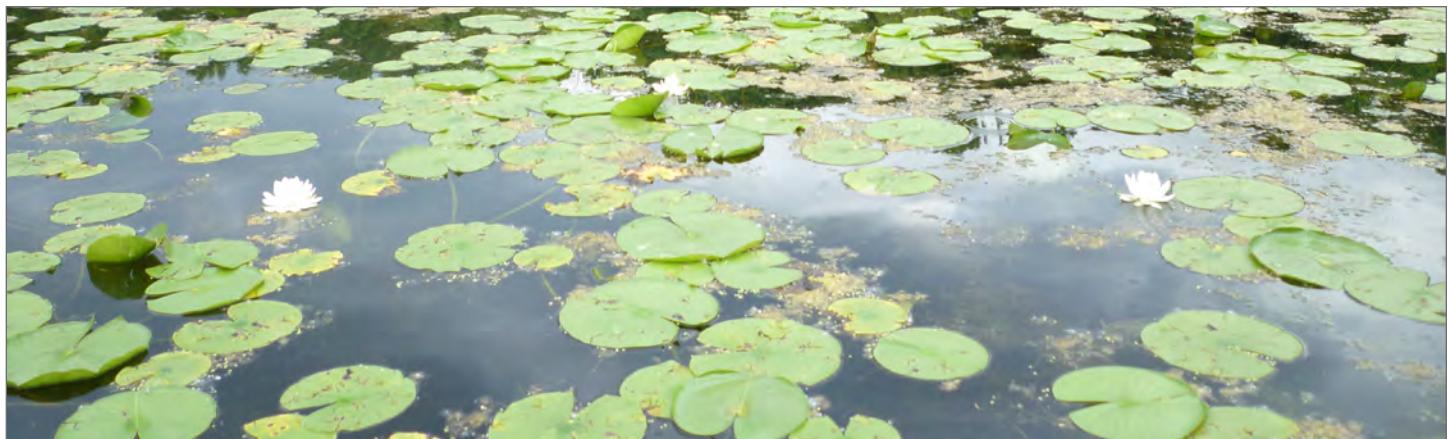


Aquatic invasive species

In 2017, one aquatic invasive species was observed in Twin Lake, curly-leaf pondweed. Curly-leaf pondweed was noted at approximately 7% of the sample points during the June 2017 survey. Though prevalent, the curly-leaf pondweed coexisted with native plants at relatively low densities.



Curly-leaf pondweed



Chloride levels in 2017

Chloride concentrations in area lakes have increased since the early 1990s when many government agencies switched from sand or sand/salt mixtures to salt for winter road maintenance. When snow and ice melts, the salt goes with it, washing into lakes, streams, wetlands, and groundwater. It only takes 1 teaspoon of road salt to permanently pollute 5 gallons of water. And, once in the water, there is no way to remove chloride.

Because high concentrations of chloride can harm fish and plant life, the MPCA has established a chronic exposure chloride standard of 230 mg/l or less.

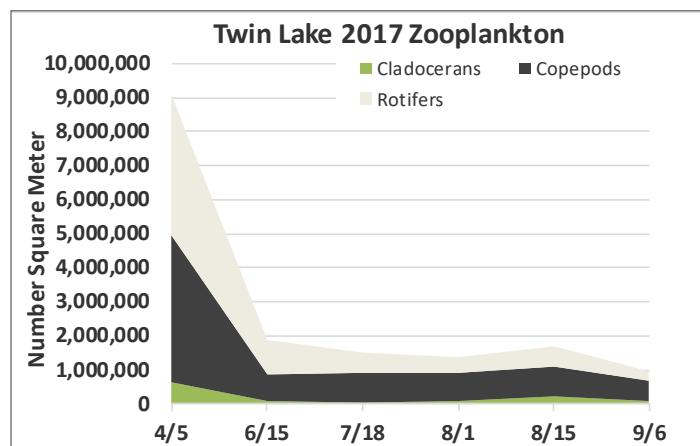
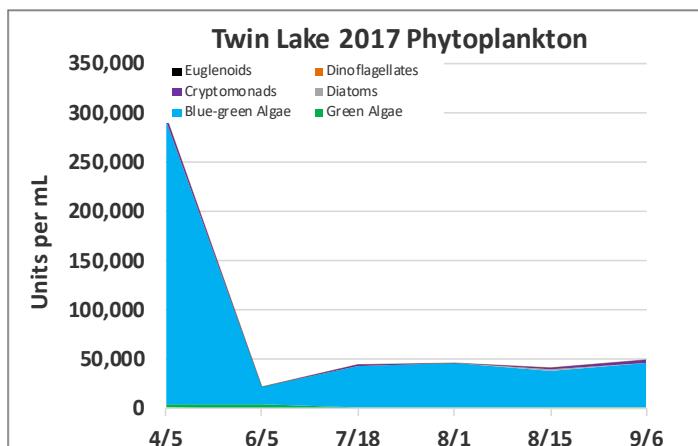
- Range of chloride concentrations in Twin Lake:
From a high of 116 mg/L, measured in June, to a low of 110 mg/L, measured in April
- Average concentration: 112 mg/L (meets MPCA standard)

Increased use of chloride for road maintenance has had an impact on chloride levels in Twin Cities metro area lakes, including Twin Lake.

Phytoplankton and zooplankton

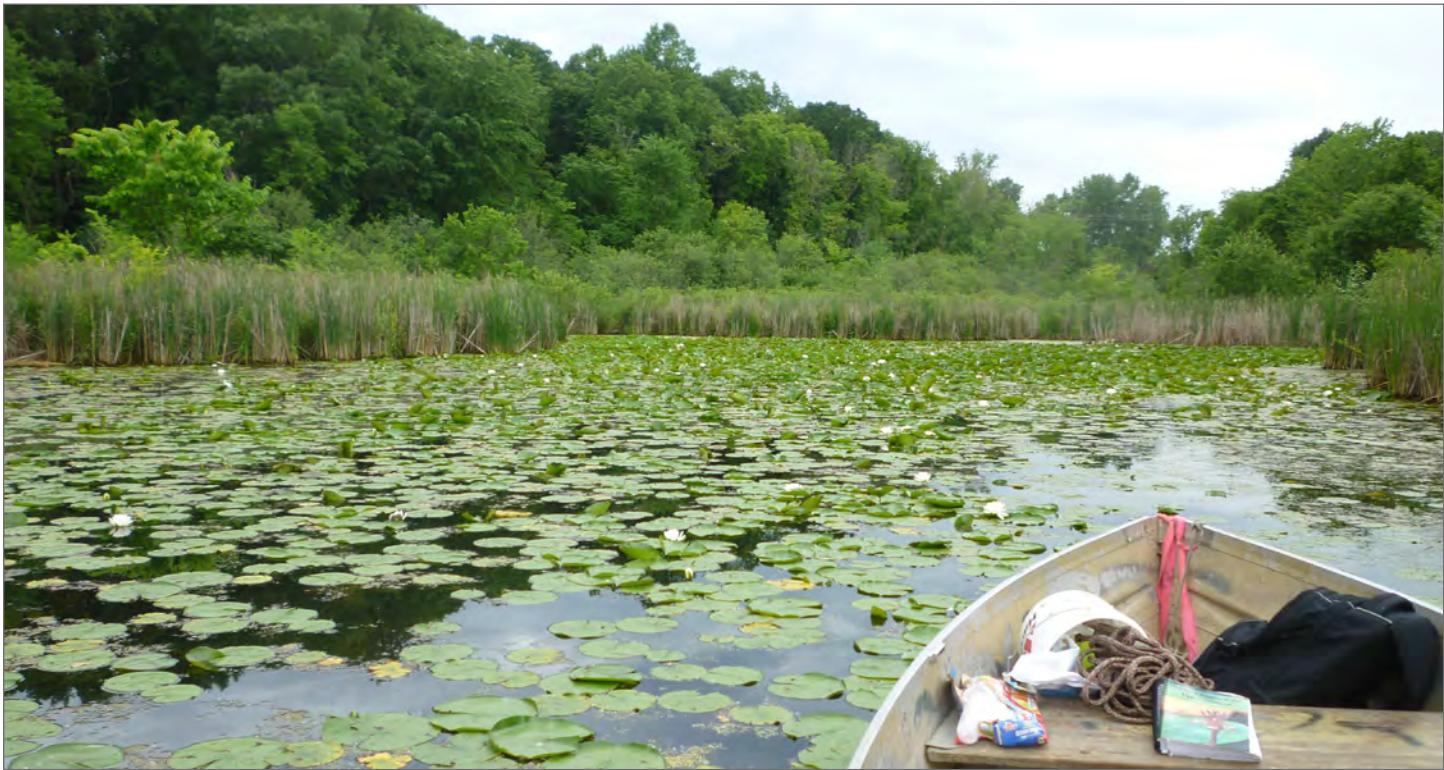
Samples of phytoplankton, microscopic aquatic plants, were collected from Twin Lake to evaluate water quality and the quality of food available to zooplankton (microscopic animals). As shown in the figure below, phytoplankton numbers were highest in April and then declined in June and remained relatively consistent throughout the rest of the summer growing season. Blue-green algae, a poor food source for zooplankton, were dominant in Twin Lake throughout the 2017 monitoring season. In high concentrations blue-green can be a source of health concerns. Blue-green algae concentrations were below 50,000 cells per milliliter from June to September which suggest a low risk of adverse health impacts to lake users.

Unlike phytoplankton, zooplankton do not produce their own food. As “filter feeders,” they eat millions of small algae; given the right quantities and species they can filter the volume of an entire lake in a matter of days. They are also a valuable food source for planktivorous fish and other organisms. The numbers and community composition of zooplankton in Twin Lake were consistent with previous years. Small rotifers and copepods were prevalent throughout the summer. Cladocerans were also observed throughout the entire monitored period, however at significantly lower concentrations compared to rotifers and copepods.



Twin Lake fish

In September, 2013 the BCWMC contracted with Blue Water Science to conduct a trap net survey on Twin Lake. A total of ten fish species were sampled during this survey with bluegill sunfish and yellow bullheads being the most abundant species. Gamefish species included largemouth bass and northern pike. Certain fish species such as common carp, in high abundance, can cause adverse water quality impacts in lakes. No common carp were sampled in Twin Lake although they were found in neighboring Sweeney Lake during a joint survey conducted in 2013.



Bassett Creek Watershed Management Commission
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Cleaner, healthier water for a growing community

Lost Lake 2017 water quality monitoring



About Lost Lake

BCWMC classification	Priority-2 shallow lake
Watershed area	61 acres
Lake size	22 acres
Average depth	3.5 feet
Maximum depth	6.5 feet
Ordinary high water level	941.2 feet
Normal water level	940.2 feet
Downstream receiving waterbody	Landlocked
Location (city)	Plymouth
MPCA impairments	None
Aquatic invasive species	None
Public access	None

Monitoring water quality in Lost Lake

The Bassett Creek Watershed Management Commission (BCWMC) has monitored water quality conditions in the watershed's 10 priority lakes and six ponds since 1972. This monitoring is done to detect changes or trends in water quality and evaluate the effectiveness of efforts to preserve or improve water quality. A summary of 2017 monitoring efforts on Lost Lake is provided below; more comprehensive information can be found on pages 2–6.

At a glance: 2017 monitoring results

In 2017, the BCWMC monitored Lost Lake for:

- Water chemistry (nutrients, chlorophyll a, chloride).
- Water measurements (e.g., clarity, dissolved oxygen).
- Phytoplankton and zooplankton (microscopic plants and animals).
- Macrophytes (aquatic plants).

Results of 2017 monitoring show that Lost Lake did not meet applicable Minnesota Pollution Control Agency (MPCA) and BCWMC water quality standards for lakes. Lost Lake is currently not on the State of Minnesota's 303(d) list of impaired waters, however the 2017 monitoring results indicate the lake would likely be considered impaired if more monitoring data were available to assess impairment. While there is not enough long-term monitoring data to perform a reliable trend analyses for Lost Lake, the lake has generally exhibited poor water quality conditions over the past 25 years. In addition, the plant community does not meet the Minnesota Department of Natural Resources (MDNR) plant index of biotic integrity (IBI) standards (see page 4).

Recommendations

- Continue water quality and biological monitoring.
- Assess/quantify internal and external drivers of poor water quality/clarity in the lake.
- Management efforts for the lake should focus on flipping the lake from its current turbid water state (poor clarity) to a clear water state to promote greater species diversity and ecosystem health.
- Perform fish surveys to determine presence/absence of fish in the lake and (if applicable) what fish species are present.
- Assess watershed nutrient loading and implement best management practices and capital improvement projects.

Water chemistry monitoring: 2017

Total phosphorus levels

While phosphorus is necessary for plant and algae growth, excessive phosphorus leads to excessive growth, decreased water clarity, and water quality impairment.

- BCWMC/MPCA standard: 60 micrograms per liter ($\mu\text{g/L}$) or less.
- Range: Total phosphorus concentrations ranged from a low of 84 $\mu\text{g/L}$ in June to a high of 130 $\mu\text{g/L}$ in September. All concentrations were within the eutrophic or hypereutrophic categories (high nutrient content).
- Summer average: 113 $\mu\text{g/L}$ (did not meet BCWMC/MPCA standard).

Chlorophyll a levels

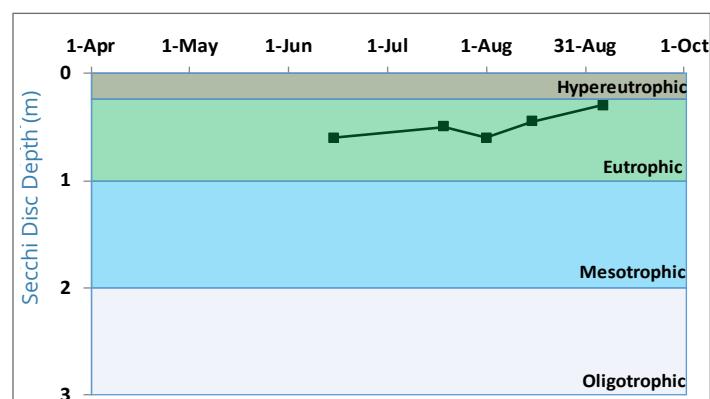
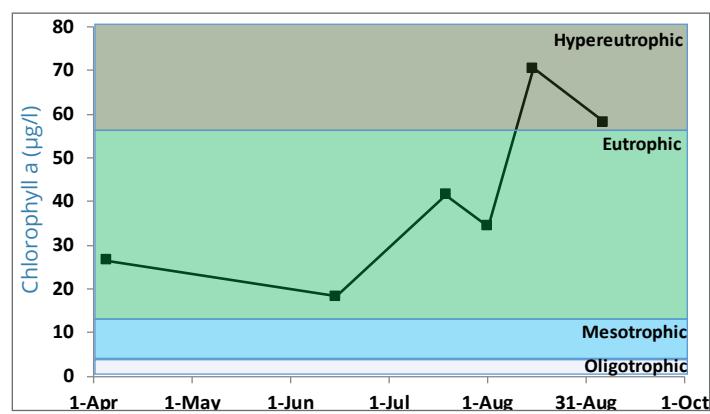
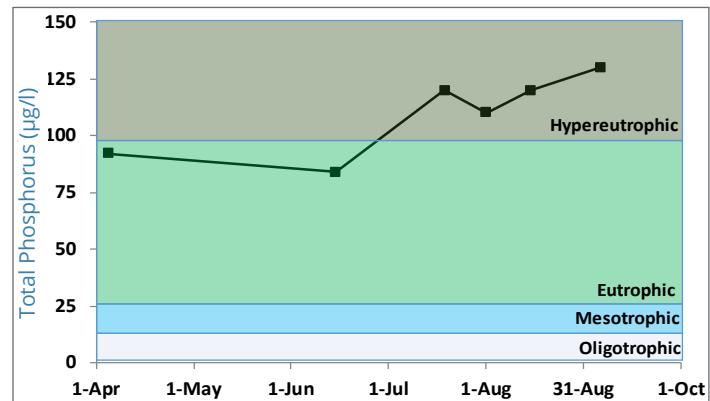
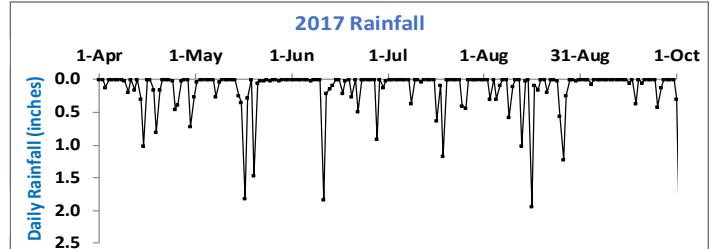
Chlorophyll a is a pigment in algae and generally reflects the amount of algae growth in a lake. Lakes which appear clear generally have chlorophyll a levels less than 15 micrograms per liter ($\mu\text{g/L}$).

- BCWMC/MPCA standard: 20 $\mu\text{g/L}$ or less.
- Range: Chlorophyll a concentrations ranged from a low of 18.3 $\mu\text{g/L}$ in June to a high of 70.4 $\mu\text{g/L}$ in August. Throughout 2017, chlorophyll a concentrations were in the hypereutrophic or eutrophic category, indicating poor water quality.
- Summer average: 44.5 $\mu\text{g/L}$ (did not meet BCWMC/MPCA standard).

Water clarity

Water clarity is often affected by sediment and the amount of algae or other photosynthetic organisms in a lake. It is usually measured by lowering an 8-inch "Secchi" disc into the lake; the depth at which the disc's alternating black-and-white pattern is no longer visible is considered a measure of the water's transparency.

- BCWMC/MPCA standard: 1.0 meters or more.
- Range: From 0.6 meters in June to 0.3 meters in September.
- Summer average: 0.5 meters (did not meet BCWMC/MPCA standard).



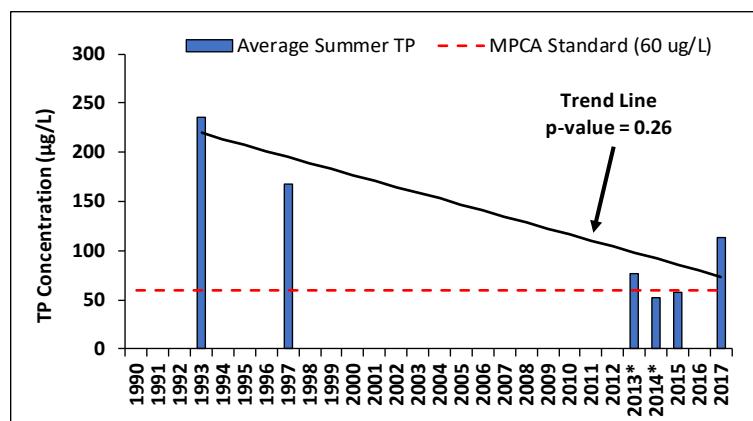
Definitions

- Eutrophic:** Lake condition characterized by abundant accumulation of nutrients supporting dense growth of algae and other organisms; decay of algae can reduce lake oxygen levels
- Hypereutrophic:** Nutrient-rich lake conditions characterized by frequent and severe algal blooms and low transparency
- Mesotrophic:** Lake condition characterized by medium levels of nutrients and clear water
- Oligotrophic:** Lake condition characterized by a low level of dissolved nutrients, high oxygen content, and sparse algae growth



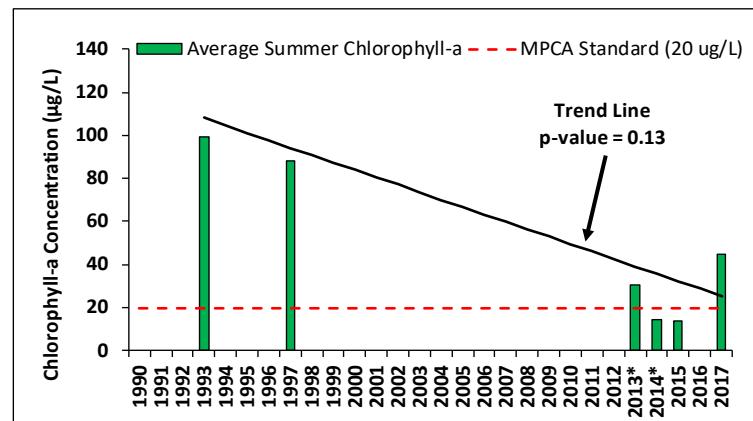
Total phosphorus trends

Note: Graphs and trend lines do not include CAMP data



Chlorophyll a trends

Note: Graphs and trend lines do not include CAMP data

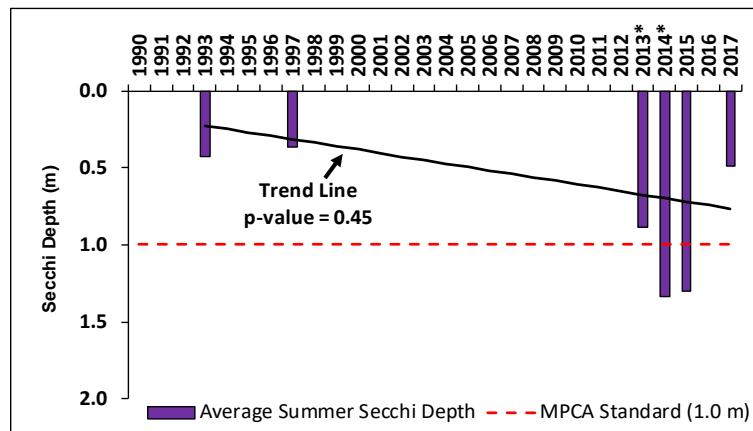


Water chemistry monitoring from 1993–2017: historical trends

Water quality in Lost Lake has been monitored since 1993. Total phosphorus, chlorophyll a, and Secchi disc transparency summer averages (June through September) for years with a minimum of four sample events are shown in the figures to the right. Years with less than four samples (2013 and 2014) are denoted with and asterisks. Summer averages for phosphorus, chlorophyll a and Secchi depth have failed to meet BCWMC/MPCA standards in four of the six years monitored. Trend analyses for Lost Lake suggests the trend lines presented in the figures to the right are not statistically significant (p-values all greater than 0.05).

Water clarity trends

Note: Graphs and trend lines do not include CAMP data



Macrophytes

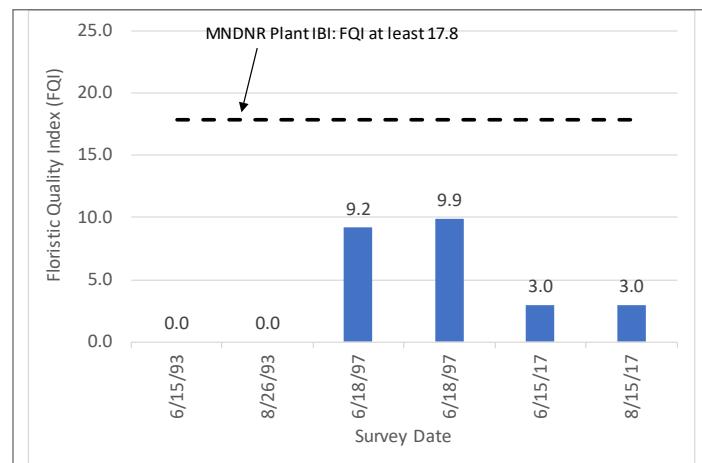
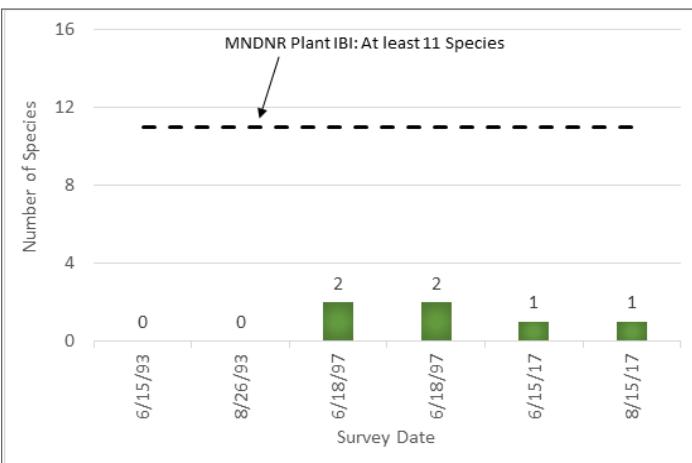
Lake Plant Eutrophication Index of Biological Integrity (IBI)

The MDNR recently developed metrics to determine the overall health of a lake's aquatic plant community. The Lake Plant Eutrophication Index of Biological Integrity (IBI) is used by the MPCA to determine whether a lake is meeting the federal Clean Water Act standards intended to protect aquatic life. The plant IBI includes two metrics: (1) the number of species in a lake and (2) the "quality" of the species, as measured by the floristic quality index (FQI).

Plant survey data from 1993 through 2017 were assessed to determine plant IBI trends. The figures below show the Lost Lake FQI scores and number of species for that period compared to the MDNR plant IBI impairment threshold.

- Number of species:** The number of species in Lost Lake decreased from two species in 1997 to one species in 2017. Canada waterweed (*Elodea canadensis*) was the only species noted during the 2017 survey. This species was present in high abundance and formed dense mats throughout much of the lake which made boating and navigation difficult.
- FQI values (quality of species):** The impairment threshold, as measured by FQI, is a minimum value of 17.8. Similar to the number of species, 2017 FQI values for Lost Lake (3.0) were well below the 17.8 impairment threshold.
- 2017 results:** Because both the number of species in the lake and FQI values are below impairment thresholds, Lost Lake would be considered impaired for aquatic plants. The lake's vegetation community would benefit from improved water quality, particularly improved water clarity.

Aquatic species found in Lost Lake



Lost Lake fish

There is currently no fish data or surveys available for Lost Lake. In small, shallow lakes such as Lost, the fish community can change significantly from year to year depending on fish kill events, winter ice conditions, lake levels, spring flooding and other environmental factors. Water quality conditions within small, shallow lakes are often strongly linked to the presence of certain fish species, particularly bullheads and fathead minnows. Thus, it is recommended that a fish survey be performed on Lost Lake using shallow lake fish sampling techniques (i.e. mini-fyke nets) to determine if fish are currently in the system and, if so, what species are present and their general abundance.



Chloride levels in 2017

Chloride concentrations in many area lakes have increased since the early 1990s when many government agencies switched from sand or sand/salt mixtures to salt for winter road maintenance. When snow and ice melts, the salt goes with it, washing into lakes, streams, wetlands, and groundwater. It only takes 1 teaspoon of road salt to permanently pollute 5 gallons of water. And, once in the water, there is no way to remove chloride.

Because high concentrations of chloride can harm fish and plant life, the MPCA has established a chronic exposure chloride standard of 230 mg/l or less.

- Range of chloride concentrations in Lost Lake: From a high of 32 mg/L, measured in April, to a low of 30 mg/L, measured in September
- Average concentration: 31 mg/L (meets MPCA standard)

Increased use of chloride for road maintenance has had an impact on chloride levels in Twin Cities metro area lakes,

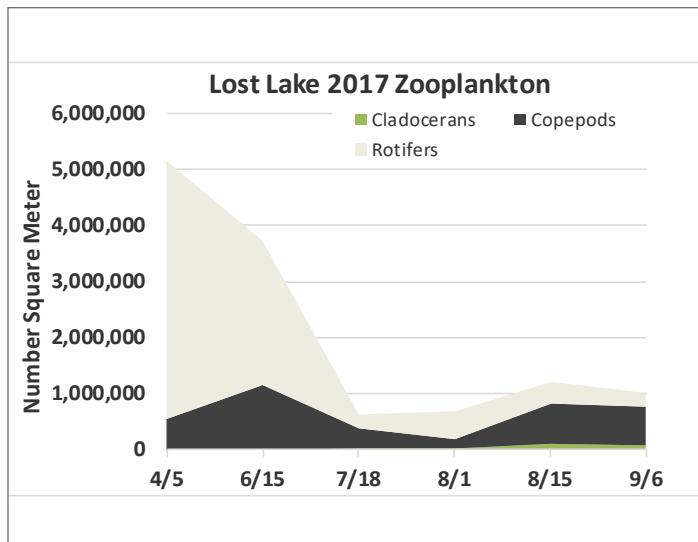
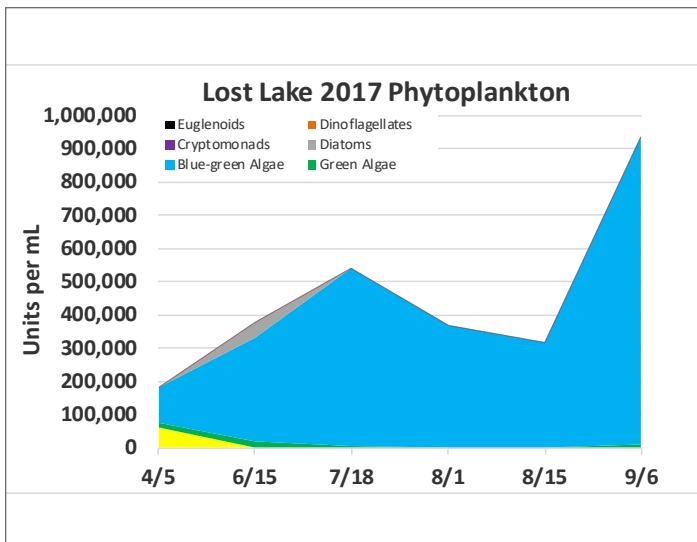
Phytoplankton and zooplankton

Samples of phytoplankton, microscopic aquatic plants, were collected from Lost Lake to evaluate water quality and the quality of food available to zooplankton (microscopic animals). As shown in the figure below, phytoplankton numbers increased between April and July, decreased slightly in August, and then increased sharply in early September. The community was dominated by blue-green algae, which is a poor food source to invertebrates. Blue-green algae can produce natural toxins; in high concentrations, these toxins can be harmful to pet and human health. The World Health Organization (WHO) has established the following guidelines for assessing the risk posed to lake users by exposure to blue-green algae.

- Lakes with blue-green algae densities less than 20,000 cells per milliliter pose no risk to the health of humans or pets.
- Exposure to lakes with blue-green algae density levels between 20,000 and 100,000 cells per milliliter poses a low risk of adverse health impacts (i.e., skin irritation or allergenic effects such as watery eyes).
- Exposure to lakes with blue-green algae densities greater than 100,000 cells per milliliter poses a moderate health risk (i.e., long-term illness from algal toxins is possible).

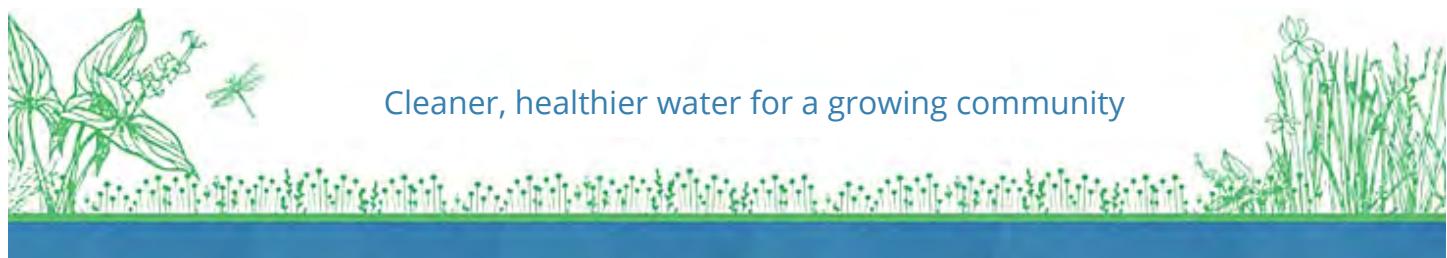
In 2017, blue-green algae numbers were in the moderate risk category throughout the entire sampling period. Higher blue-green algae concentrations correlated with increasing surface water phosphorus and chlorophyll a concentrations.

Unlike phytoplankton, zooplankton do not produce their own food. As “filter feeders,” they eat millions of small algae; given the right quantities and species they can filter the volume of an entire lake in a matter of days. They are also a valuable food source for planktivorous fish and other organisms. The numbers and community composition of zooplankton in Twin Lake were consistent with previous years. Small rotifers and copepods were prevalent throughout the summer, while cladocerans were observed only in mid-July, August and September.





Bassett Creek Watershed Management Commission
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Appendix C

2017 Resolutions



Bassett Creek Watershed Management Commission

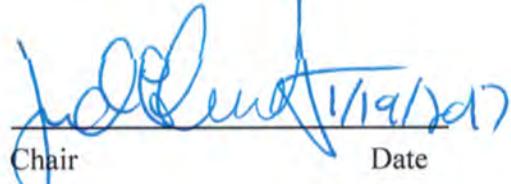
RESOLUTION NO. 17-01

Member Mueller introduced the following resolution and moved its adoption:

A RESOLUTION APPROVING THE REIMBURSEMENT TO THE BASSETT CREEK WATERSHED MANAGEMENT COMMISSION 1.4% OF THE TAX LEVY REQUEST TO HENNEPIN COUNTY FOR COLLECTION IN 2016, FOR ADMINISTRATIVE EXPENSES FOR CAPITAL IMPROVEMENT PROGRAM (CIP) PROJECTS AND APPROVING THE TRANSFER OF THE FUNDS FROM THE CIP ACCOUNT TO THE ADMINISTRATIVE ACCOUNT

BE IT RESOLVED by the Bassett Creek Watershed Management Commission of the Cities of Crystal, Golden Valley, Medicine Lake, Minneapolis, Minnetonka, New Hope, Plymouth, Robbinsdale, and St. Louis Park that:

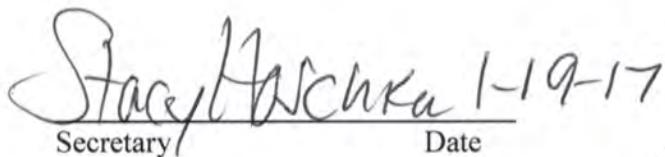
1. The Bassett Creek Watershed Management Commission (BCWMC) will be reimbursed \$17,108, which is 1.4% of the BCWMC's September 2015 tax request in the amount of \$1,222,000 to Hennepin County for collection in 2016, for administrative expenses for Capital Improvement Projects.
2. The Bassett Creek Watershed Management Commission directs its Deputy Treasurer to transfer the reimbursed funds from the Commission's CIP Account to its Administrative Account.



John Schmit
Chair

Date

Attest:



Stacy Wachka 1-19-17
Secretary Date

The motion for adoption of the foregoing resolution was seconded by Member Croagh and upon a vote being taken thereon, the following voted in favor thereof: 5 and the following voted against the same 0 whereupon said resolution was declared duly passed and adopted.



Bassett Creek Watershed Management Commission

RESOLUTION NO. 17-02

Member Mueller introduced the following resolution and moved its adoption:

A RESOLUTION APPROVING THE TRANSFER OF BASSETT CREEK WATERSHED MANAGEMENT COMMISSION FUNDS FROM THE ADMINISTRATIVE ACCOUNT TO THE EROSION/SEDIMENT (CHANNEL MAINTENANCE) ACCOUNT AND LONG-TERM MAINTENANCE ACCOUNT

BE IT RESOLVED by the Bassett Creek Watershed Management Commission
that:

1. \$25,000 will be transferred from the Bassett Creek Watershed Management Commission's Administrative Account to the Erosion/Sediment (Channel Maintenance Fund) account.
2. \$16,000 will be transferred from the Bassett Creek Watershed Management Commission's Administrative Account to the Long-Term Maintenance account which equals the annual \$25,000 transfer amount less the cost of the 2016 inspections of the BCWMC Flood Control Project of \$9,000.



John D. Bent 1/19/2017

Chair Date

Attest:

Stacy Heschka
Secretary

1-19-17
Date

The motion for adoption of the foregoing resolution was seconded by Member Crough and upon a vote being taken thereon, the following voted in favor thereof: 5 and the following voted against the same 0 whereupon said resolution was declared duly passed and adopted.

RESOLUTION 17-03

Member Prom introduced the following resolution and moved its adoption:

RESOLUTION DESIGNATING DEPOSITORYES FOR BASSETT CREEK WATERSHED MANAGEMENT COMMISSION FUNDS

BE IT RESOLVED by the Bassett Creek Watershed Management Commission of the Cities of Crystal, Golden Valley, Medicine Lake, Minneapolis, Minnetonka, New Hope, Plymouth, Robbinsdale, and St. Louis Park that the following are named as depositories for funds, subject to the furnishing of collateral for funds on deposit as provided in the Laws of the State of Minnesota: **RBC Dain Rauscher; Wells Fargo; 4M Fund**

BE IT FURTHER RESOLVED that a sweep account will be used for nightly balances.

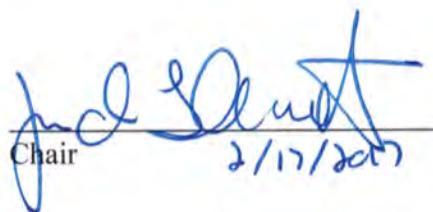
BE IT FURTHER RESOLVED that the following signatories or alternates are authorized to be signatories on checks drawn on funds deposited:

General Checking: Chair or Vice Chair and Treasurer or Deputy Treasurer
Each check shall require two signatures.

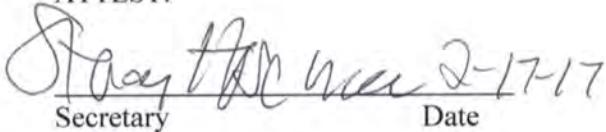
BE IT FURTHER RESOLVED that the following shall be authorized to make investments of the Bassett Creek Watershed Management Commission and shall be authorized to deposit the principal of said investments in the above named depositories as necessary and beneficial to the Bassett Creek Watershed Management Commission: Deputy Treasurer of the Bassett Creek Watershed Management Commission.

The Deputy Treasurer shall supply each of the depositories with certified copies of this resolution along with such signature documentation as is required by the depository and the authorizations set forth above.

16th Adopted by the Board of the Bassett Creek Watershed Management Commission this day of February 2017.


Chair 2/17/2017

ATTEST:


Stacy Holter 2-17-17
Secretary Date

The motion for the adoption of the foregoing resolution was seconded by Member Holter and upon a vote being taken thereon, the following voted in favor thereof: 8 and the following voted against the same 0 whereupon said resolution was declared duly passed and adopted.

A RESOLUTION GRANTING A VARIANCE FROM WATER QUALITY TREATMENT REQUIREMENTS FOR THE 2017 GOLDEN VALLEY PAVEMENT MANAGEMENT PROGRAM

Bassett Creek Watershed Management Commission
Resolution #17-04

WHEREAS, the City of Golden Valley (“City”) requests a variance from the Bassett Creek Watershed Management Commission (“BCWMC”) water quality treatment requirements, known as the Minimal Impact Design Standards (“MIDS”) performance goals, for the 2017 Golden Valley Pavement Management Program (“Project”);

WHEREAS, the City and its consulting engineer have studied the options available to meet the MIDS treatment standards for the Project and have determined that it is not feasible to satisfy the standards as part of the Project because of the linear nature of the Project, the existence of poor soils in the Project area that are not conducive to volume reduction, and the confined right-of-way area in which the Project will be constructed;

WHEREAS, the City will construct all practical and feasible water quality best management practices available in conjunction with this Project, including reducing impervious area and installing sump manholes with SAFL baffles, but despite these efforts the Project will not meet the MIDS performance goals including the three flexible treatment options;

WHEREAS, the City can provide equivalent offsite treatment to meet the MIDS performance goals for the Project by the end of 2018; and

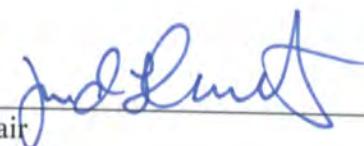
WHEREAS, the Board of Commissioners (“Board”) has considered the request, the standards for issuing variances in the BCWMC’s Requirements for Improvements and Development Proposals, and finds and determines as follows:

1. The linear nature of the Project, the poor soils, and the limited area in which the Project will be constructed constitute special circumstances or conditions such that the strict application of the provisions of the standards and criteria would deprive the City of the reasonable use of its right-of-way and its ability to construct improvements;
2. The requested variance is necessary for the preservation and enjoyment of a substantial property right of the applicant in that the City is working to improve its right-of-way for the benefit of the public;
3. Granting the variance will not be detrimental to the public welfare or injurious to the other property in the territory of the right-of-way being improved in that the Project will be increasing safety and addressing existing surface water issues;
4. The Project does not relate to a use in the 1% (base flood elevation, 100-year flood) floodplain set forth in Table 2-9 of the Plan;

5. Granting the variance will not be contrary to the intent of taking all reasonable and practical steps to improve water quality within the watershed in that the City will implement all practical and feasible water quality best management practices available in conjunction with this Project, including reducing impervious area and installing sump manholes with SAFL baffles.

NOW, THEREFORE, BE IT RESOLVED, by the Board of the BCWMC that, pursuant to its variance procedure the BCWMC Requirements for Improvements and Development Proposals, the findings contained herein, and the record of this matter, it hereby grants the City a variance from the MIDS performance goals for the Project conditioned on the City agreeing to 1) implement all practical and feasible water quality best management practices, including reducing impervious area and installing sump manholes with SAFL baffles, related to the construction of the Project; and 2) provide equivalent offsite treatment to meet the MIDS performance goals for the Project by the end of 2018.

Adopted by the Board of Commissioners of the Bassett Creek Watershed Management Commission this 16th day of March, 2017.



Judi Lantz
Chair

Attest:



Michael Scanlan
Secretary

Resolution No. 17-04 : Offered by Commissioner Harwell, seconded by Commissioner Scanlan, adopted by a vote of 6-2 at the regular meeting of the Board of Commissioners of Bassett Creek Watershed Management Commission on March 16, 2017.

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION

RESOLUTION NO. 17-05

A RESOLUTION AUTHORIZING THE COMMISSION'S
ENGINEER TO EXECUTE CONDITIONAL LICENSE AGREEMENTS

WHEREAS, the Board of Commissioners of the Bassett Creek Watershed Management Commission ("Board") relies on its engineer to perform a variety of duties for the Commission, including certain administrative activities that cannot reasonably wait to be brought before the Commission for review and approval;

WHEREAS, one such administrative activity that needs prompt attention is the execution of the Conditional License Agreement with outside companies and agencies for use of the Commission's modeling program, identified as the BCWMC XP-SWMM model ("Agreement"); and

WHEREAS, the Board desires to authorize its engineer to execute the Agreement on the Commission's behalf as needed.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Commissioners of the Bassett Creek Watershed Management Commission that it hereby authorizes its engineer, Barr Engineering Co., to execute the Commission's Agreement on the Commission's behalf and to take such other actions as may be needed to implement the terms of the Agreement and to otherwise carry out the intent of this Resolution.

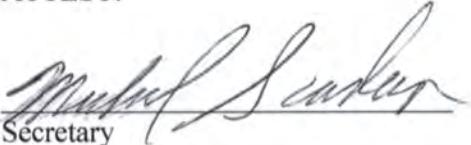
BE IT FINALLY RESOLVED, the engineer is authorized to work with the Commission's attorney as needed to address any proposed amendments to the Agreement.

Adopted on the 20th day of July 2017.

BY THE BOARD OF COMMISSIONERS


Chair BCWMC chair

ATTEST:


Michael Scader
Secretary

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION

RESOLUTION NO. 17-06

A RESOLUTION ORDERING THE 2018 IMPROVEMENT,
DESIGNATING THE MEMBER RESPONSIBLE FOR CONSTRUCTION,
MAKING FINDINGS PURSUANT TO MINNESOTA STATUTES, SECTION
103B.251, CERTIFYING COSTS TO HENNEPIN COUNTY, AND APPROVING
THE AGREEMENT FOR CONSTRUCTION OF THE IMPROVEMENT

WHEREAS, on September 17, 2015, the Commission adopted the *Bassett Creek Watershed Management Commission, Water Management Plan, September 2015* (the “Plan”);

WHEREAS, the Plan includes a Capital Improvement Program (“CIP”) listing capital projects in Table 5-3 of the Plan;

WHEREAS, the CIP includes the following capital project for the year 2018:

- (a) Bassett Creek Park Pond Dredging Project (2018 BCP-2);

WHEREAS, the Commission approved completing Phase I of the project: Winnetka Pond Dredging at its May 18, 2017 meeting (hereinafter referred to as the “2018 Project”);

WHEREAS, the Plan specifies a county tax levy under Minnesota Statutes, section 103B.251 as the source of funding for the 2018 Project;

WHEREAS, the Commission also needs to include as part of the county tax levy the costs to complete the remaining portions of the approved 2017 projects, which include the Plymouth Creek Restoration Project (2017CR-P) and the Main Stem Channel Restoration (Erosion Repair) Project (2017CR-M) (collectively, the “2017 Projects”); and

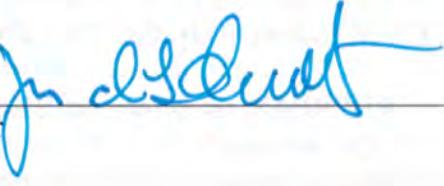
WHEREAS, on September 21, 2017, following published and mailed notice in accordance with the Commission’s Joint Power Agreement and Minnesota Statutes, section 103B.251, the Commission conducted a public hearing on the 2018 Project.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Commissioners of the Bassett Creek Watershed Management Commission as follows:

1. The 2018 Project will be conducive to the public health and promote the general welfare and is in compliance with Minnesota Statutes, sections 103B.205 to 103B.255 (the “Act”) and with the Plan as adopted and amended in accordance with the Act. The 2018 Project is hereby ordered.
2. The estimated cost of the 2018 Project is One Million Dollars (\$1,000,000). Of this amount, One Million Dollars (\$1,000,000) will be paid from funds received from a county tax levy pursuant to Minnesota Statutes, section 103B.251 levied in 2017 for collection in 2018.

3. The estimated cost for the remaining portions of the 2017 Projects is Three Hundred Forty Six Thousand Eight Hundred and Fifteen Dollars (\$346,815), which is to be paid from funds received from a county tax levy pursuant to Minnesota Statutes, section 103B.251 levied in 2017 for collection in 2018.
4. The total amount certified to Hennepin County for collection in 2018 is One Million Three Hundred Forty Six Thousand Eight Hundred and Fifteen Dollars (\$1,346,815) for payment by the County in accordance with Minnesota Statutes, section 103B.251, subdivision 6.
5. The Commission has received, accepted, and approved the feasibility report for the 2018 Project.
6. The cost of the 2018 Project will be paid by the Commission up to the amount specified in paragraph 2 above from proceeds received from Hennepin County pursuant to Minnesota Statutes, section 103B.251 and grant funding, if awarded. Additional costs may be paid by the city constructing the 2018 Project, but no costs will be charged to other members of the Commission.
7. The City of Crystal is designated as the member responsible for contracting for the construction of the 2018 Project, and the engineer designated for preparation of plans and specifications is the Crystal City Engineer, or other engineers selected and retained by the City of Crystal. Contracts for construction shall be let in accordance with the requirements of law applicable to the City of Crystal. The Cooperative Agreement with the City of Crystal for the construction of the 2018 Project is approved, and the Chair and Secretary are authorized to execute the agreement on behalf of the Commission.

Adopted by the Board of Commission of the Bassett Creek Watershed Management Commission the 21st day of September, 2017.


Chair

ATTEST:


Secretary

BASSETT CREEK WATERSHED MANAGEMENT COMMISSION

RESOLUTION NO. 17-07

A RESOLUTION ADOPTING A REVISED FEE SCHEDULE

WHEREAS, the Board of Commissioners (“Board”) of the Bassett Creek Watershed Management Commission (“Commission”) is authorized by the joint powers agreement that established the Commission, Minnesota Statutes, sections 103B.201 through 103B.251, and the adopted Watershed Management Plan to perform certain project reviews and to serve as the local government unit for reviews under the Minnesota Wetland Conservation Act in the cities of Medicine Lake, Robbinsdale, and St. Louis Park;

WHEREAS, the Board charges fees in attempt to defray the administrative and professional costs the Commission incurs to conduct the reviews;

WHEREAS, the last fee schedule was adopted in 2015 and the Board determines there is a need to update the fees to more effectively defray the costs it actually incurs for the reviews;

WHEREAS, because the actual costs of some reviews far exceed the amount of fees collected for the review, the Board determines there is a need to require applicants to reimburse the Commission for actual costs it incurs for the review in excess of \$5,000; and

WHEREAS, the Board determines the fees established on the attached fee schedule are fair, reasonable, proportionate, and reasonably reflect the actual costs the Commission incurs to provide the review services.

NOW, THEREFORE, BE IT RESOLVED, by the Board of Commissioners as follows:

1. The attached fee schedule is hereby adopted for the Commission, including the requirement that an applicant reimburse the Commission for any actual costs the Commission incurs to conduct a review that exceeds \$5,000.
2. The attached fee schedule is effective October 1, 2017, it applies to any applications submitted on or after that date, and it supersedes and replaces the previous fee schedule.

Adopted this 21 day of September 2017.

BY THE BOARD OF
COMMISSIONERS


Chairperson

Attest: 
Secretary

Appendix D
2017 Website Usage Report



Reports

Jan 1, 2017 - Dec 31, 2017

 All Users
100.00% Sessions

Total unique users

3,801

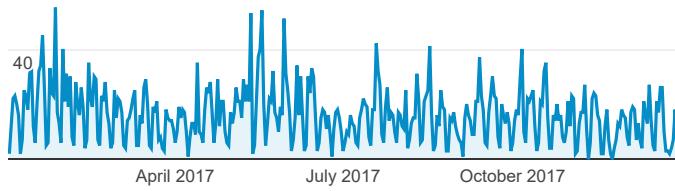
% of Total: 42.29% (8,988)



Users

Users

80



Sessions By Page

Page	Sessions
/	3,992
/lakes-streams/plymouth-creek	212
/document/meeting-materials-minu	188
/lakes-streams	134
/lakes-streams/main-stem-bassett-creek	134
/index.php?cID=284	124
/lakes-streams/sweeney-lake	118
/meeting-events	116
/document/wmp-plans	109
/projects	97

Total Sessions

6,945

% of Total: 56.97% (12,190)



Avg. Session Duration

00:03:11

Avg for View: 00:01:50 (72.42%)



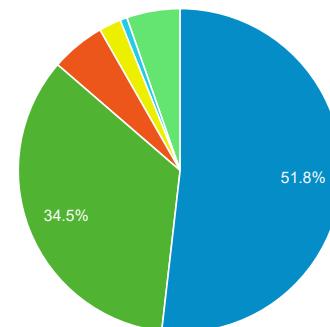
Avg. Pages per session

3.29

Avg for View: 2.32 (41.53%)



Traffic source

 google (blue) (direct) (green) bing (orange) yahoo (yellow) ci.minneapolis.mn.us (cyan)


Sessions by Browser

Browser	Sessions
Chrome	3,911
Internet Explorer	1,344
Safari	956
Firefox	497
Edge	164
Safari (in-app)	16

Sessions by City

City	Sessions
Minneapolis	1,330
Plymouth	863
Golden Valley	699
Eden Prairie	588
Saint Paul	396
Saint Louis Park	394
Bloomington	366
Minnetonka	144
Chicago	111
Richfield	106

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