

Black Dog Watershed Management Organization

2018 ANNUAL ACTIVITY REPORT



**Prepared for
Black Dog Watershed
Management Commission**

May 2019

2018 BOARD MEMBERS

The Black Dog Watershed Management Organization was established by a joint powers agreement. The member cities appoint Board Members (and alternates) to serve three-year terms. The 2018 Black Dog Watershed Management Organization Board Members and the city/cities they represent are listed below:

Board Members:	Term Ending
1. Roger Baldwin (Chair) Representing the City of Burnsville	November 2020
2. Greg Helms (Vice-Chair) Representing the Cities of Apple Valley and Eagan	November 2020
3. Scott Thureen (Secretary/Treasurer) Representing the City of Lakeville	November 2020
4. Tom Harmening Representing the City of Burnsville	November 2020
5. Mike Hughes Representing the City of Burnsville	November 2020

Alternate Board Members:	Term Ending
1. Rollie Greeno Representing the Cities of Apple Valley and Eagan	November 2020
2. Curtis Enestvedt Representing the City of Burnsville	November 2020
3. Vacant Representing the City of Lakeville	November 2020

CONSULTANTS

In accordance with Minnesota Statutes, Section 103B.227, Subdivision 5, the Black Dog Watershed Management Commission solicited interest proposals for engineering consulting, legal services, and auditor services in January 2018. As the statutes require the solicitation to occur every two years, the Black Dog Watershed Management Commission will solicit proposals again in 2020. The Black Dog Watershed Management Commission Board retains services from the following consultants:

Engineering:	Barr Engineering Co. Karen Chandler 4300 MarketPointe Dr. Minneapolis, MN 55435 Phone: (952) 832-2600
Legal:	Campbell, Knutson Attorneys at Law Roger Knutson 317 Eagandale Office Center 1380 Corporate Center Drive Eagan, MN 55121 Phone: (651) 452-5000
Auditor:	MMKR: Certified Public Accountants James Eichten 5353 Wayzata Boulevard Suite 410 Minneapolis, MN 55416 Phone: (952) 545-0424

The Black Dog Watershed Management Organization currently does not employ any staff. Administrative support is provided by the City of Burnsville.

Administrator	City of Burnsville Daryl Jacobson 13713 Frontier Ct. Burnsville, MN 55337 Phone: (952) 895-4574
Website:	www.blackdogwmo.org

PERMITS AND VARIANCES

The Black Dog Watershed Management Organization does not have a permit program.

WETLAND BANKING

The Black Dog Watershed Management Organization does not have a wetland banking program.

STATUS OF LOCAL PLAN ADOPTION AND IMPLEMENTATION

The BDWMO adopted the 2012 Watershed Management Plan in October, 2012. The member cities are required to update their local water management plans to conform to the 2012 BDWMO Plan, per Minnesota Statute 103B.235. In 2014, the City of Burnsville updated their Water Resources Management Plan; the BDWMO approved the updated plan at their May 21, 2014 meeting. At their November 16, 2016 meeting, the BDWMO approved the City of Apple Valley's 2007 Surface Water Management Plan and associated city ordinances, finding them in conformance with the 2012 BDWMO Plan. In 2017, the City of Burnsville updated their Water Resources Management Plan; the BDWMO approved the updated plan at their September 20, 2017 meeting. At their July 18, 2018 meeting, the BDWMO approved the City of Apple Valley's Surface Water Management Plan. At their December 19, 2018 meeting, the BDWMO approved the City of Eagan's Storm Water Master Plan Update and Water Quality and Wetland Management Plan.

2018 Black Dog WMO Activities

- Participated in the Metropolitan Council's Citizen-Assisted Lake Monitoring Program (CAMP) at the following Black Dog WMO-designated strategic water bodies: Crystal Lake, Keller Lake, Kingsley Lake, Lac Lavon, and Orchard Lake. Performed management level monitoring at Crystal Lake (see below). Completed water quality trend analyses on these lakes using the information gathered through CAMP and the more-detailed monitoring on Crystal Lake.
- Performed management level monitoring of Crystal Lake water quality, per guidance in the Black Dog WMO Plan. The monitoring consisted of collecting samples on 11 occasions—ice out and then May through September, twice per month. On each monitoring occasion, samples were collected at the deepest spot in the lake at seven depths, a surface sample (0-2 meters), plus six samples at 1-meter intervals from 3 meters to 8 meters depth. All of the samples were analyzed for total phosphorus; the surface water samples were also analyzed for chlorophyll-a. Secchi disc readings were also taken. Field probe measurements of water temperatures, dissolved oxygen concentrations, pH levels, specific conductivities, and oxidation/reduction potentials were collected at 1-meter depth intervals at the deepest spot in the lake. Field probe measurements of turbidity measurements were also taken on the surface water sample at the monitoring location. The City of Burnsville performed aquatic vegetation surveys on two occasions over the monitoring season. The work also included entering data into EQuIS database, and submitting the data to the MPCA. A technical memo summarizing the water quality monitoring results will be completed in 2019 and posted on the BDWMO website.
- Completed a feasibility study and implementation planning in preparation for the Keller Lake Alum Treatment project slated to begin in 2019. In 2018, this work included sediment core collection and analysis for phosphorus fractionations, determination of an alum dosage plan, public outreach, presentation to the Commission, and development of the Engineer's estimate of costs. The Black Dog WMO applied for and was awarded a BWSR Clean Water Fund grant for the alum treatment project. In 2019 this project will include preparation of contract documents, permitting, contract administration, treatment oversight, alum treatment expenses, and grant reporting. The project (and grant funding) will continue through 2021.
- Performed habitat monitoring of Crystal Lake. A redesigned habitat monitoring program was implemented beginning in 2011 with Kingsley Lake. The program now includes monitoring of a single water body on a cycle of once every five years. Monitoring included a meandering survey of the entire lake (in the submergent, emergent, and upland buffer zones), rather than only at sample plots, as done in the past. The lake was also evaluated for sedimentation and shoreline erosion problems. A memo summarizing the habitat monitoring results will be completed in 2019 and posted on the BDWMO website.

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- Partnered with the Dakota County SWCD by providing funding and support to install 18 water quality improvement projects through the Landscaping for Clean Water program for Black Dog WMO residents, consistent with SWCD cost share policies.
 - Partnered with the Dakota County SWCD to fund two Landscaping for Clean Water workshops and two, two-part design workshops (i.e., two nights) in the Black Dog WMO area attended by homeowners.
 - Continued implementing plan to accrue funds in 1) a Capital Improvement Fund, to be used for future BDWMO internal load reduction projects stemming from TMDLs for lakes with intercommunity shoreline (Crystal Lake, Keller Lake, and Lac Lavon), and 2) in a General Fund Reserve to be used for the BDWMO watershed plan ten-year update.
 - Conducted an annual evaluation of the watershed programs and reported the results to member communities via the Watershed Annual Report and Annual Activity Report.
 - Formulated and approved the 2019 Work Plan and Budget.
 - Completed the 2017 Annual Finance Statement.
 - Developed an annual activity report and watershed annual report and distributed them via the Black Dog WMO website and through the member communities (see attached Watershed Annual Report). The annual activity report meets all of the State reporting requirements and is submitted to the Minnesota Board of Water and Soil Resources (BWSR).
 - Reviewed and responded to any issues and opportunities brought to the attention of the Black Dog WMO.
 - Maintained, updated, and revised the Black Dog WMO website.

****Table 1 shows the Status of Implementation Tasks from the BDWMO *Watershed Management Plan*****

2018 Black Dog WMO Expenditures

	<u>BUDGET</u>	<u>ACTUAL</u>
<u>General Engineering Support:</u>	31,000	\$39,643
Consulting services for engineering support, such as to prepare for and attend meetings, review/respond to issues and opportunities, apply for grants, review/comment on proposed projects, EAWs, revisions to local water management plans, comprehensive plans, and other plans; communications/ meetings with agencies and member cities; track and report on impaired waters and TMDL issues, and other tasks.		
<u>Special Projects – General Fund:</u>		
Crystal Lake Management Level Monitoring.	\$21,200	\$13,266
Funding to conduct “management level” monitoring of the lake’s water quality, per guidance in the BDWMO Plan.		
Dakota County SWCD—Landscaping for Clean Water Program Support	\$13,500	\$15,000
Funds to partner with the Dakota County SWCD Landscaping for Clean Water program for BDWMO residents.		
2017 Work Carried into 2018	\$10,854	\$10,480
Finalization of the 2017 Orchard Lake water quality monitoring report and the 2017 Orchard Lake habitat monitoring report.		
<u>Special Projects – Capital Improvement Fund:</u>		
Keller Lake Alum Treatment Feasibility Study & Implementation Planning.	\$33,000	\$23,213
Funding to prepare a feasibility study report and plan for the 2019 Keller Lake alum treatment.		
<u>Insurance:</u>	\$3,000	\$2,606
<u>Legal and Audit:</u>	\$4,400	\$4,123
Consulting fees for legal and annual audit services.		
<u>Administrative Support:</u>	\$18,000	\$16,259
City of Burnsville charges for providing administrative support to the Commission, including staff time, printing and postage.		
<u>Public Education:</u>	\$18,675	\$15,533
Cost to produce and distribute the annual activity report and watershed annual report, funding support for the Dakota County SWCD Landscaping for Clean Water workshops and grant program, and costs to maintain the BDWMO website.		

<u>Water Quality Monitoring:</u> Cost associated with water quality monitoring programs, including the habitat monitoring program, Metropolitan Council's CAMP, and analysis of water quality data.	\$14,550	\$14,800
<u>Conference / Publications:</u> Commissioner training and education materials.	\$500	\$0
<u>Contingency:</u> Funding for unexpected expenses and/or new program opportunities approved by the Commission	\$5,000	\$49
Expenditure Total:	\$173,679	\$154,972

2018 Black Dog WMO Revenues

	<u>BUDGET</u>	<u>ACTUAL</u>
<u>Interest</u>	\$40	\$7,835
<u>Member City Contributions (Fees)</u>	\$131,000	\$131,000
<u>Member City Contributions—Capital Improvement Fund</u>	\$22,000	\$22,000
<u>Grants</u>	\$0	\$0
<u>Fund Balance Utilized</u>	\$0	\$0
Revenue Total:	\$153,040	\$160,835

2018 Black Dog WMO Planned Changes in Fund Balance

	<u>BUDGET</u>	<u>ACTUAL</u>
<u>Capital Improvement Fund:</u> This fund serves as a savings account for future internal load reduction projects stemming from TMDLs.	(\$11,000)	\$22,000
<u>General Fund Reserve:</u> This fund serves as a savings account for the BDWMO watershed plan ten-year update.	\$1,215	\$33,459
Planned Changes in Fund Balance Total:	(\$9,785)	\$55,459

2019 Black Dog WMO Goals & Work Plan

1. Participate in Metropolitan Council's Citizen Assisted Water Quality Monitoring Program (CAMP) for the following strategic water bodies:

*Crystal Lake

*Keller Lake

*Kingsley Lake

*Lac Lavon

*Orchard Lake

Complete water quality trend analyses on these lakes using the information gathered through CAMP and the more detailed monitoring on Crystal Lake.

2. Perform additional (management level) monitoring on Lac Lavon, as recommended in the Black Dog WMO Watershed Management Plan. The monitoring will consist of collecting samples on 11 occasions—ice-out and then May through September, twice per month. On each monitoring occasion, samples will be collected at seven depths at the deepest spot in the lake—a surface sample, plus six samples at one-meter intervals from three to eight meters. All of the samples will be analyzed for total phosphorus. In addition, Secchi disc readings will also be taken, and the surface samples will be analyzed for chlorophyll-a. Field measurements of temperature, dissolved oxygen, pH, redox potential, and specific conductivity will be taken at one meter intervals at the monitoring location. Turbidity measurements will also be taken on the surface water sample at the monitoring location. The monitoring will also include performing point-intercept aquatic plant surveys in June and August. The work includes field work, lab work, QA/QC of lab data (including coordination with lab), entering data into EQuIS database, submitting the data to the MPCA, preparing a technical memo summarizing the monitoring results, and preparing a presentation for a Commission meeting.
3. Conduct the first year of a planned multi-year alum treatment of Keller Lake. The 2019 work includes contract administration and treatment oversight, which will be paid for with the carry-over budget from 2018 for the Keller Lake Alum Treatment Feasibility Study and Implementation Planning project. The Black Dog WMO was awarded a \$230,000 BWSR Clean Water Fund Grant in December 2018, which covers 80% of the project cost (grant requires a 20% local share).
4. Perform habitat monitoring of Lac Lavon. Habitat monitoring is performed at one strategic water body per year, such that all five strategic water bodies will be completed over a five-year cycle. Monitoring will include a meandering survey around the entire lake as well as the previously established sample plots (in the emergent and upland buffer zones) and identification of sedimentation and shoreline erosion problems. The aquatic plant survey results from the management level monitoring of the lake will be used to evaluate the submergent zone. The work includes analysis and reporting of 2019 data, and preparation of a presentation for a Commission meeting, which may need to be carried over into 2020.
5. Conduct an annual evaluation of the watershed programs and report the results to member communities via a watershed annual report (this report is incorporated into the annual activity report submitted to the Minnesota Board of Water and Soil Resources).

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6. Partner with the Dakota County SWCD by providing funding and support to install up to 18 water quality improvement projects through the Landscaping for Clean Water program for Black Dog WMO residents, consistent with SWCD cost share policies.
 7. Partner with the Dakota County SWCD to fund two Landscaping for Clean Water workshops and two design workshops (four evenings) in the Black Dog WMO area.
 8. Complete the 2018 Annual Finance Statement—statute changes allow the Black Dog WMO to perform audits every five years, rather than every year. (The last audit was prepared for year 2014; the next audit will need to be prepared in 2020 for year 2019.)
 9. As budget allows, prepare up to two educational pieces and/or presentations for the Commission regarding new technology (e.g., new stormwater best management practices, new lake treatment technologies, etc.) or aquatic invasive species.
 10. Apply for grants and/or assist member cities with grant applications.
 11. Perform grant administration tasks for BWSR Clean Water Fund watershed-based funding grant. (This work will be performed by the City of Apple Valley, rather than Black Dog WMO, as the city took over as the fiscal agent for the grant.)
 12. Formulate and approve the year 2020 Work Plan and Budget.
 13. Review and respond to any issues and opportunities brought to the attention of the Black Dog WMO.
 14. Maintain and update web site.
 15. Respond to requests to partner with member communities and Dakota County on educational outreach programs.
 16. Keep abreast of changes to the TMDL program, including additions to/removals from the impaired waters list and the listing criteria.
 17. Review revisions to local water management and comprehensive plans as needed. No reviews are expected in 2019, as the member cities' plans will be reviewed and approved by the end of 2018.
 18. Continue implementing plan to accrue funds in 1) a Capital Improvement Fund, to be used for future BDWMO internal load reduction projects stemming from TMDLs for lakes with intercommunity shoreline (Crystal Lake, Keller Lake, and Lac Lavoie) and 2) in a General Fund Reserve to be used for the BDWMO watershed plan ten-year update.

—See Attached Watershed Annual Report for information on the 2019 Budget—

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
Administrative and Operational—Watershed-wide			
General WMO administration, including reviewing and responding to issues and opportunities (not otherwise described in this table) as they arise. This may include services provided by: <ul style="list-style-type: none"> Administrator (City of Burnsville) BDWMO consulting engineer BDWMO Attorney 	Ongoing	BDWMO continues to perform these actions as needed/requested. In 2018, this included coordinating with local units of government and BWSR regarding BWSR's watershed-based funding initiative.	Continue to perform as needed/requested.
Revise joint powers agreement (JPA) to allow cost allocation apportionment specified in Section 4.7.4 – Policy 8 of the 2012 BDWMO Plan (funding of internal load reduction projects)	2013	Revision of the JPA not required to develop and implement plan to accrue funds in a Capital Improvement Fund.	None.
Review Burnsville local watershed management plan	2014	BDWMO approval of plan in 2017.	None.
Review Lakeville local watershed management plan	2014	BDWMO approval of last plan in 2008. Major plan update began in 2017.	Review of updated plan anticipated in 2019.
Review Apple Valley local watershed management plan	2014	BDWMO approval of plan in 2018.	None.
Review Eagan local watershed management plans	2014	BDWMO approval of plan in 2018.	None.
Miscellaneous reviews including, but not limited to: <ul style="list-style-type: none"> Review city comprehensive plan changes that require review by the Metropolitan Council Review projects for consistency with the BDWMO plan, as requested by member cities or other governmental agencies Review and approve any proposed changes to the intercommunity stormwater system that are inconsistent with an approved local plan Review and approve changes to an approved local plan that would cause the local plan to be inconsistent with the BDWMO plan 	Ongoing	BDWMO continues to perform these reviews as needed/requested.	Continue to perform as needed/requested.

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
City technical staff (technical advisor) attendance at BDWMO meetings	Ongoing	City technical staff regularly attend BDWMO meetings	City staff continue to attend BDWMO meetings.
Facilitate intercommunity flood control, stormwater runoff, erosion, and sediment control projects	As needed	No facilitation of intercommunity projects currently planned	Provide facilitation, if needed.
Apply for and/or assist member cities with grant applications	Ongoing	The BDWMO continues to pursue these opportunities as they arise. In 2018, the BDWMO applied for a BWSR Clean Water Fund grant for the Keller Lake Alum Treatment project; BWSR awarded the BDWMO \$230,000 for the project. Also in 2018, the BDWMO allocated its portion of BWSR's watershed-based funding to the City of Apple Valley's Redwood Pond project to improve stormwater treatment in the Keller Lake watershed.	Continue to apply for grants or assist member cities in their grant applications, as appropriate/requested.
Complete and submit annual audit to BWSR	Ongoing	Submitted annually; per revised statute, the BDWMO is required to perform an audit every 5 years, rather than annually. In the other years, the BDWMO will prepare an annual finance statement. The last audit was prepared for year 2014; the next audit will need to be prepared for year 2019.	Prepare next audit in 2020; prepare annual finance statements in intervening years.
Update BDWMO Watershed Management Plan	2020	BDWMO adopted its latest Watershed Management Plan in 2012.	Planning for an updated Plan will begin in 2020.
Development of TMDL Studies and Implementation Plans	Ongoing	BDWMO will perform these tasks as necessary; there are no TMDL studies or implementation plans currently planned by the BDWMO	BDWMO will perform these tasks as necessary; do not anticipate studies in the near future.

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
Complete and publish watershed annual report (newsletter) and post on website	Ongoing	Published annually.	Complete annually.
Complete and submit annual activity report to BWSR and post on website	Ongoing	Completed, published, and submitted annually	Complete annually.
Create, maintain and update web site—put plan, data, meeting agenda and minutes, watershed annual reports, water quality monitoring reports, educational materials, project updates, etc. on the site	Ongoing	Website is hosted by Dakota SWCD and regularly updated as new material is available.	Continue to maintain and update website.
Educational outreach including, but not limited to: exploring social media and email list serves to expand communication with the public, sponsoring workshops in partnership with the Blue Thumb program, the promotion of awareness of groundwater resource issues, and seeking volunteers to participate in water quality and water quantity programs	Ongoing	Provided watershed annual report to member cities and posted to BDWMO website; maintained website (see above); since 2009, BDWMO has partnered with the Dakota SWCD to fund Landscaping for Clean Water (formerly Blue Thumb) Program workshops in the BDWMO area. BDWMO funded 4 workshops in 2018 (2 Landscaping for Clean Water Intro Workshops and 2 Landscaping for Clean Water Design Workshops).	Continue providing watershed annual report to member cities and partnering with Dakota SWCD to fund workshops.

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps																								
Implementation of small-scale best management practices on private property to improve water quality	Ongoing	<div>Since 2009, BDWMO has partnered with the Dakota County SWCD by providing funding and support to install water quality improvement projects through the Landscaping for Clean Water Program (formerly Blue Thumb and Community Conservation Cost Share Programs) for Black Dog WMO residents. Projects have included rainwater gardens, native gardens, shoreline improvements, and a bioretention site.</div> <table><thead><tr><th>Year</th><th>Number of projects</th></tr></thead><tbody><tr><td>2009</td><td>9</td></tr><tr><td>2010</td><td>7</td></tr><tr><td>2011</td><td>6</td></tr><tr><td>2012</td><td>18</td></tr><tr><td>2013</td><td>13</td></tr><tr><td>2014</td><td>16</td></tr><tr><td>2015</td><td>18</td></tr><tr><td>2016</td><td>16</td></tr><tr><td>2017</td><td>17</td></tr><tr><td>2018</td><td>18</td></tr><tr><td>Total</td><td>138</td></tr></tbody></table>	Year	Number of projects	2009	9	2010	7	2011	6	2012	18	2013	13	2014	16	2015	18	2016	16	2017	17	2018	18	Total	138	Continue partnering with Dakota SWCD to fund water quality improvement projects.
Year	Number of projects																										
2009	9																										
2010	7																										
2011	6																										
2012	18																										
2013	13																										
2014	16																										
2015	18																										
2016	16																										
2017	17																										
2018	18																										
Total	138																										
Implement recommended internal phosphorus load reduction projects identified in UAA and/or TMDL for non-strategic waterbodies or strategic waterbodies without inter-community shoreline	As needed	BDWMO will implement these projects when watershed load reduction projects have been implemented and further water quality improvements are needed. See below for BDWMO’s Keller Lake implementation project.	Implement when needed (see Keller Lake actions below).																								

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps										
Annual CAMP water quality monitoring, performing trend analysis, and establishing action levels for the following strategic waterbodies: <div><div>• Crystal Lake</div><div>• Keller Lake</div><div>• Kingsley Lake</div><div>• Lac Lavon</div><div>• Orchard Lake</div></div>	Ongoing	CAMP monitoring completed annually; trend analysis completed annually.	Continue annual CAMP monitoring and trend analyses of monitoring data.										
Management level water quality monitoring performed at 3-year intervals for the following strategic waterbodies: <div><div>• Crystal Lake</div><div>• Lac Lavon</div><div>• Orchard Lake</div></div>	Ongoing	Performed for one lake annually; most recent monitoring includes Lac Lavon in 2016, Orchard Lake in 2017, and Crystal Lake in 2018.	Continue cycle of monitoring: Lac Lavon in 2019, Orchard Lake in 2020, and Crystal Lake in 2021.										
Habitat monitoring at 5-year intervals for the following strategic waterbodies: <div><div>• Crystal Lake</div><div>• Keller Lake</div><div>• Kingsley Lake</div><div>• Lac Lavon</div><div>• Orchard Lake</div></div>	Ongoing	Implementation of the redesigned program began in 2011; habitat monitoring has been performed as shown below: <table><tr><td>Kingsley Lake</td><td>2011, 2016</td></tr><tr><td>Orchard Lake</td><td>2012, 2017</td></tr><tr><td>Crystal Lake</td><td>2013, 2018</td></tr><tr><td>Lac Lavon</td><td>2014</td></tr><tr><td>Keller Lake</td><td>2015</td></tr></table>	Kingsley Lake	2011, 2016	Orchard Lake	2012, 2017	Crystal Lake	2013, 2018	Lac Lavon	2014	Keller Lake	2015	Continue cycle of monitoring: Lac Lavon in 2019, Keller Lake in 2020, Kingsley Lake in 2021, Orchard Lake in 2022, and Crystal Lake in 2023
Kingsley Lake	2011, 2016												
Orchard Lake	2012, 2017												
Crystal Lake	2013, 2018												
Lac Lavon	2014												
Keller Lake	2015												
Implement lake water quality management actions recommended in Table 4-1 of the 2012 BDWMO Plan, depending on water quality trends and comparison of recent water quality to action level, for the following strategic waterbodies: <div><div>• Kingsley Lake</div><div>• Lac Lavon</div><div>• Orchard Lake</div></div>	As needed	BDWMO will implement these actions as necessary; there are no actions currently planned.	Continue tracking water quality trends and action levels and take actions as/when necessary.										

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
Capital Projects—Crystal Lake			
Implement recommended watershed projects to reduce runoff-borne phosphorus loads, as identified in the TMDL, that may include: <ul style="list-style-type: none"> • Street sweeping • Native shoreline buffers • Public outreach and education 	Ongoing	Projects to be performed by member cities (Lakeville, Burnsville) with possible grant funding from BDMWO. Burnsville performs street sweeping in the watershed twice a year and performs ongoing outreach and education. Beyond website articles and city newsletter information, city staff meet with the Crystal Lake association twice a year. BDWMO also performs ongoing public education.	Cities perform projects as needed; continue to perform public education.
Implement recommended internal phosphorus load reduction projects identified in the TMDL, that may include: <ul style="list-style-type: none"> • In-lake alum treatment • Aquatic macrophyte management • Internal load reduction in upstream Keller Lake 	As needed	The BDWMMO began the Keller Lake Alum Treatment project in 2018. Other potential future projects are listed in Table 5-3 of the 2012 BDWMO Plan; no other projects are currently planned.	Continue implementation of the Keller Lake Alum Treatment project in 2020 and 2021. Implement other projects when recommended.

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
Capital Projects—Keller Lake			
<p>Implement recommended watershed projects to reduce runoff-borne phosphorus loads, as identified in the TMDL, that may include:</p> <ul style="list-style-type: none"> • Construction of a water quality treatment pond in Crystal Beach Park • Construction of a water quality treatment pond on southwest side of Keller Lake • Street sweeping • Native shoreline buffers • Public outreach and education 	<p>Ongoing</p> <p>2013 – 2015 (Crystal Beach Park project)</p> <p>2018 (SW Keller Lake project)</p>	<p>Member cities perform projects, with possible grant funding obtained by BDWMO; BDWMO performs ongoing public education.</p> <p>Crystal Beach Park project: the City of Burnsville completed the project in 2017.</p> <p>SW Keller Lake project: the City of Burnsville will construct this if additional total phosphorus load reductions are required in the watershed. However, if the Crystal Beach Park project meets the city's TMDL load reduction goals for Keller Lake, the city will not construct the SW Keller Lake project.</p> <p>In 2017, the City of Apple Valley conducted a subwatershed assessment for the portions of the city that drain to Keller Lake to target potential projects. The city will construct one of the projects (Redwood Pond) in 2020.</p>	<p>Burnsville will construct SW Keller Lake project if additional load reductions required.</p> <p>Apple Valley will construct the Redwood Pond project in 2020 and implement other projects from the subwatershed assessment as budget and opportunity allows.</p>
<p>Implement recommended internal phosphorus load reduction projects identified in the TMDL, that may include:</p> <ul style="list-style-type: none"> • In-lake alum treatment • Aquatic macrophyte management 	<p>As needed</p>	<p>Keller Lake Alum Treatment project began in 2018, with completion of a feasibility study, implementation planning, and applying for a BWSR Clean Water Fund grant. Other potential future projects are listed in Table 5-3 of the 2012 BDWMO Plan; no other projects are currently planned.</p>	<p>Perform first Keller Lake alum treatment in 2019 and second treatment in 2021.</p>

Table 1: Status of Implementation Tasks from 2012 BDWMO Watershed Management Plan—through December 31, 2018

Implementation Task	Original Implementation Date from Plan	Status/Accomplishments	Next Steps
<i>Capital Projects—Orchard Lake, Kingsley Lake, and Lac Lavon</i>			
Implement water quality improvement measures in Orchard Lake, Kingsley Lake, and Lac Lavon as identified in future diagnostic feasibility studies, that may include: <ul style="list-style-type: none">Watershed projects (e.g., stormwater treatment ponds, rainwater gardens, infiltration basins)Internal load reduction projects (e.g., in-lake alum treatment, aquatic macrophyte management)	As needed	BDWMO will implement projects as necessary; no projects are currently planned.	Implement projects as necessary; no projects planned.

2018 Watershed Annual Report

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Black Dog Watershed Management Organization

2018 WATERSHED ANNUAL REPORT

Published April 2019

Our mission is . . .

To provide leadership in the management and stewardship of the water resources in northwestern Dakota County, Minnesota, through the cooperation of four cities and the involvement of local stakeholders.

Evaluating our Success

The BDWMO watershed management plan calls for the organization and its member cities to identify outcome-based goals for specific water bodies found within the watershed, and to meet annually to discuss progress toward these goals. The BDWMO uses the following tools to track progress toward goals:

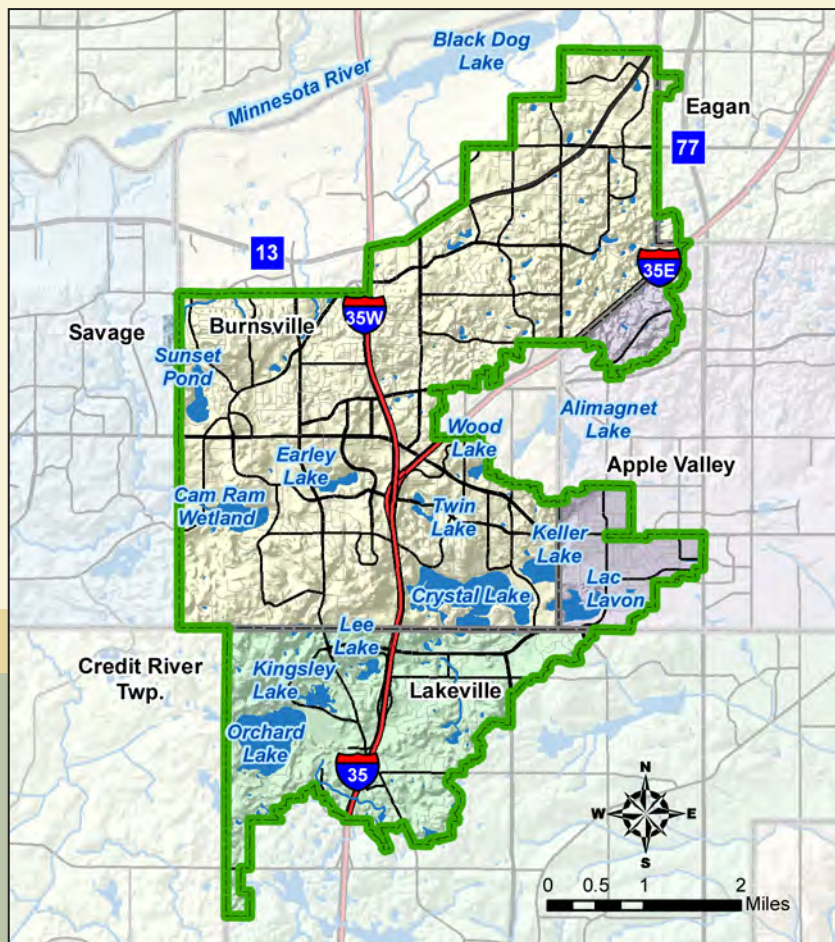
- **Trend Analysis**—The BDWMO collects water quality information to track water quality trends.
- **Performance Analysis**—The BDWMO will evaluate the member cities' implementation of maintenance plans, capital improvement projects, programs, and other items.
- **Habitat Quality Analysis**—The BDWMO collects habitat quality data to detect conditions that would trigger a need for management actions.

This annual report outlines the BDWMO's goals, progress toward those goals in 2018, and plans for 2019 and beyond.

What is the Black Dog Watershed Management Organization?

The Black Dog Watershed Management Organization (BDWMO) actively manages surface water, such as that found in lakes, streams, and wetlands, located in the Black Dog and Credit River watersheds within Dakota County. To effectively manage surface water, the BDWMO develops and implements plans that address water quality, responds to drainage issues that cross multiple municipal boundaries, and assists cities within the watershed to manage surface water runoff. The BDWMO is represented by commissioners who are appointed by the cities within the watershed, which include Burnsville, Lakeville, Apple Valley, and Eagan.

The total area of the Black Dog watershed is 17,500 acres; 70 percent of the watershed lies within the city of Burnsville, 21 percent of the area is within the city of Lakeville, 8 percent is within the city of Apple Valley, and 1 percent is within the city of Eagan.



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- 2019 Income & Expenditures.....page 8

Improvements Coming for Keller Lake

Assessing Feasibility of Alum Treatment for Keller Lake

In 2018, a feasibility study was conducted to determine if alum treatment would be a good approach for improving water quality in Keller Lake.

The feasibility study included sediment core collection and analysis; determination of an alum dosage plan; and compilation/consolidation of supporting information to apply for a BWSR Clean Water Fund (CWF) grant to complete the in-lake management practices.

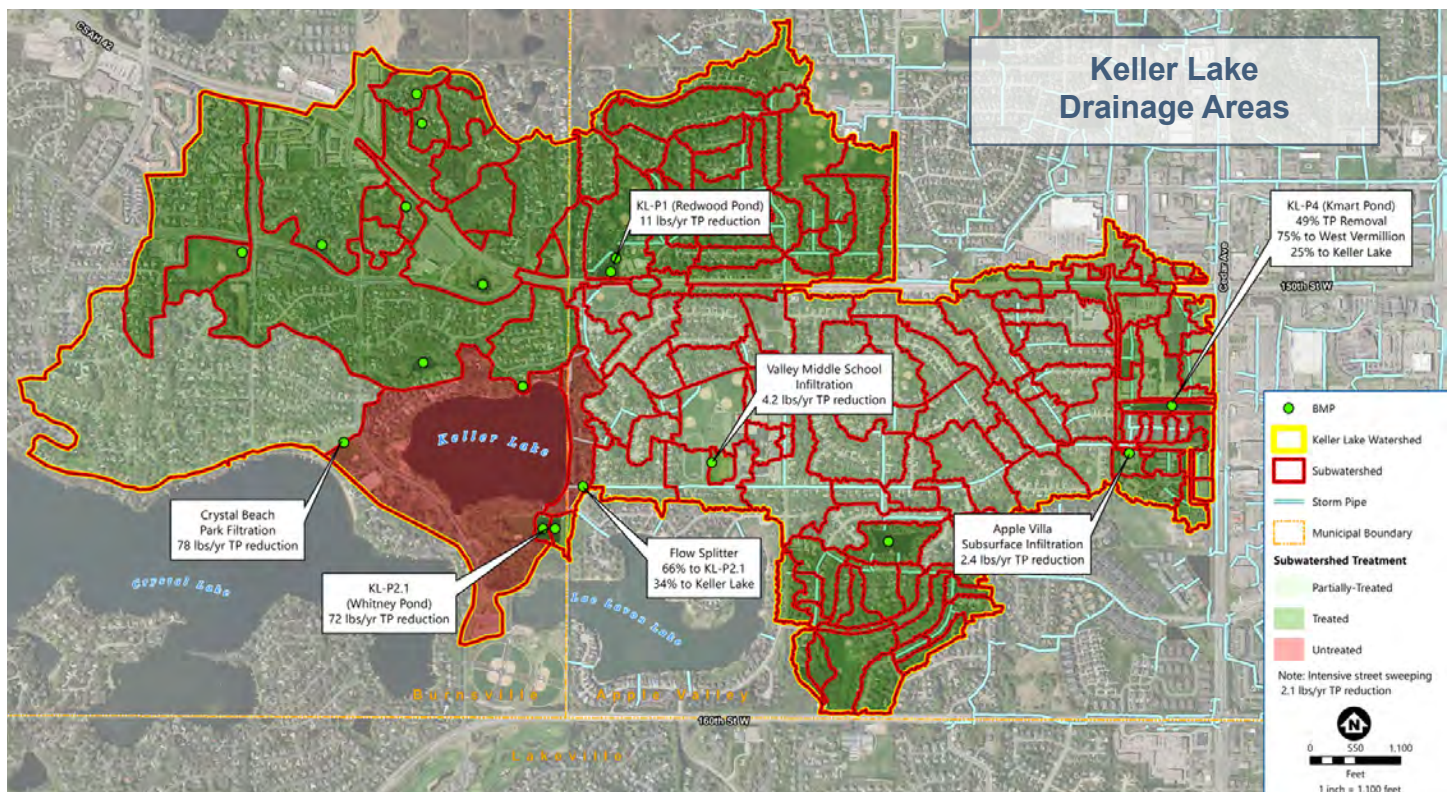
Preparation for the report entailed reviewing reports and data collected on Keller Lake, including the total maximum daily load (TMDL) report and implementation plan, sustainable lake management plans, storm sewer and treatment practice plans, proposed redevelopment plans, fish and aquatic plant survey reports, bathymetric surveys and internal loading analyses.

The feasibility study determined that, at a minimum, the proposed in-lake aluminum application is expected to reduce the annual average TP (total phosphorus) load to Keller Lake by 80% or 186 lbs/yr. It is estimated that the BMPs implemented since the completion of the TMDL

How Does Alum Treatment Work?

When aluminum is applied to lake water, it binds with phosphorus in the lake sediment, forming a compound. After it binds with the aluminum, the phosphorus no longer supplies nutrients to lake algae, reducing its growth.

Two forms of aluminum are typically applied to lakes: alum and sodium aluminate. When alum is added to a lake, it will lower the pH (make it more acidic), while sodium aluminate will raise the pH (more basic). Therefore, these two chemicals are often added in combination to neutralize the pH effects during treatment.



will remove more than 159 lbs/yr of the watershed TP load. Another 11 lbs/yr will be addressed through a 2020 project, partially funded by a BWSR watershed-based CWF grant. The in-lake aluminum application represents most of the remaining TP load reduction required to ensure that the shallow lake standards can be met in Keller Lake on a consistent basis.

Keller Lake Gets BWSR Grant for Alum Treatment

In exciting news, the BDWMO received a BWSR CWF grant for the alum treatment project to improve Keller Lake's water quality.

Secondary benefits of this project are that it will improve water clarity and provide the means for attaining a healthy native plant community in the lake. In addition, this project will improve the water quality of Crystal Lake, which is immediately downstream of Keller Lake. Protecting the water quality of Crystal Lake is also important as it was recently removed from the impaired waters list for eutrophication (see page 4 for story on Crystal Lake water quality monitoring).

Landscaping for Clean Water—Clean Water Starts at Home

Since most land is privately owned, it is up to each individual landowner to do the right thing on their property to help keep water clean. The Landscaping for Clean Water program makes it easy for residents to turn their yards into a lush and lovely force for clean water rather than a contributor to water pollution.

Are you doing everything possible on your patch of lawn? Attend a Landscaping for Clean Water workshop to find out. Participants in the program attend design workshops to develop landscape plans for their own yards. These plans include creating native gardens, raingardens, or native shorelines that stabilize soil. These planting practices provide habitat for pollinators and birds, reduce watering and require no chemical inputs. On top of that, these

practices help water soak into the ground rather than running off and delivering polluted stormwater into lakes, rivers and wetlands.

Who gets a grant?

Participants can submit an application, project plan, and cost estimates to the Dakota County SWCD for grant funds of up to \$250. In 2018, 55 homeowners attended Landscaping for Clean Water Introductory workshops hosted by the BDWMO; 40 went on to design projects. Of those, 18 projects within the WMO received construction funding grants and were installed. Up to 18 Landscaping for Clean Water Introductory projects will also be funded by the BDWMO in 2019. Homeowners must attend workshops to apply for grants.

Landscaping for Clean Water is one type of cost-sharing program offered by the Dakota County SWCD (see table below). For more information, call 651-480-7777 or go to www.dakotaswcd.org/costshare.html.

Program	For Who?	Award \$\$\$	Project Examples
Landscaping for Clean Water Grants	Dakota County homeowners	\$250	Native gardens Rain gardens Native shoreline plantings
Citizen Conservation Stewards (CCS)	Dakota County property owners	Up to \$5,000 (up to 75% of actual project cost)	Erosion and slope stabilization; gully, wetland, lake or stream restorations; sediment basins; bioretention practices; shoreline stabilizations
Conservation Initiative Funding (CIF)	For the implementation of conservation practices on commercial or multiple properties in Dakota County	Up to \$25,000 (up to 75% of actual project cost)	Low-impact development practices; stormwater retrofit with best-management practices; erosion and slope stabilization; gully, wetland, lake, or stream restorations; bioretention practices; shoreline stabilizations
Community Conservation Partnership (CCP)	Public landowners interested in implementing TMDL and local water management plans	Up to \$50,000 (up to 75% of actual project cost)	Bioretention; infiltration; filtration soil amendments; rooftop disconnect; reduced impervious surface areas; porous pavements; thermal impact prevention/mitigation practices; snowmelt treatment; stormwater recycling; best management practices
Native Prairie Restoration (NPR)	Dakota County Property owners to install native prairie vegetation and pollinator habitat	75% of project costs (up to \$2,000/acre for native prairie vegetation and \$1,000/acre for pollinator habitat)	Site preparation, seed, and planting of native vegetation; enhancement of existing prairie vegetation with pollinator species

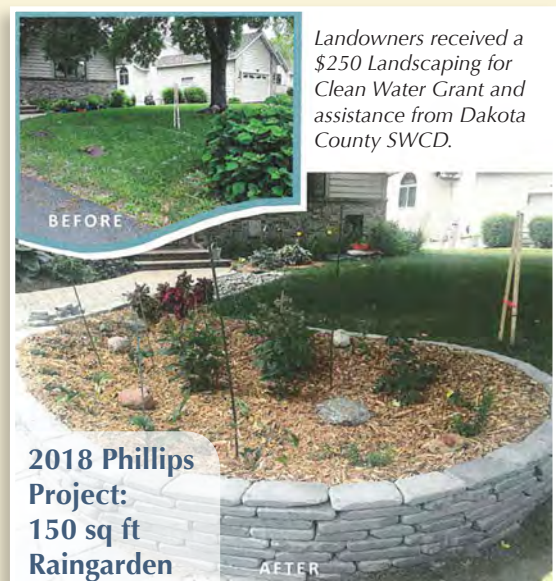
Helpful Resources for Improving Water Quality

There are other helpful resources where homeowners can find more information on how they can protect and improve water quality. Below are links to some of this information.

- www.blue-thumb.org
- <http://www.dnr.state.mn.us/restoreyourshore/index.html>
- <http://www.dnr.state.mn.us/lakescaping/index.html>
- <http://www.dnr.state.mn.us/gardens/nativeplants/index.html>

For septic system owners, it's important to maintain the system to protect water quality. Learn more at the links below:

- <http://septic.umn.edu/septic-system-owners>
- <https://www.septic.umn.edu/septic-system-owners/owners-guide/>
- <https://www.co.dakota.mn.us/Environment/WaterResources/SepticSystem/Pages/default.aspx>



Landowners received a \$250 Landscaping for Clean Water Grant and assistance from Dakota County SWCD.

Crystal Lake Keeps on Sparkling

Crystal Lake is a 292-acre lake located in the cities of Burnsville and Lakeville. The BDWMO is pleased to report that Crystal Lake continues to show good water quality, and the lake has recently been removed from the MPCA's list of waterbodies impaired for nutrients (i.e., phosphorus). The 2018 summer-average Secchi disc transparency (a measure of water clarity) was 2.15 meters (7.0 feet), which is better than the MPCA deep lake water quality standard of 1.4 meters. The 2018 summer-average total phosphorus was 22 µg/L, which was one of the best summer averages on record, and better than the MPCA's deep lake standard of 40 µg/L. The summer average of chlorophyll-a was 9 µg/L, which was the best on record for Crystal Lake, and better than the MPCA's deep lake standard of 14 µg/L.

During the period of 2008 to 2011, the BDWMO, along with its member communities, the Minnesota Pollution Control Agency (MPCA), and other state and local agencies, developed a Total Maximum Daily Load (TMDL) report for Crystal Lake. The TMDL was required because the MPCA added Crystal Lake to its impaired waters list in 2002. Two other lakes in the Crystal Lake watershed – Keller Lake and Lee Lake* – were also part of the TMDL report. The TMDL established phosphorus load allocations that would achieve water quality goals for Crystal, Keller, and Lee Lakes. The BDWMO member cities continue to implement water quality improvement measures with the goal of improving water quality in Crystal, Keller and Lee Lakes. Additional information regarding the Three-Lake TMDL can be found on page 2 of the BDWMO's 2011 Watershed Annual Report.

**Although part of the Crystal Lake watershed, Lee Lake often acts as a landlocked waterbody, so it's not always draining to Crystal Lake.*

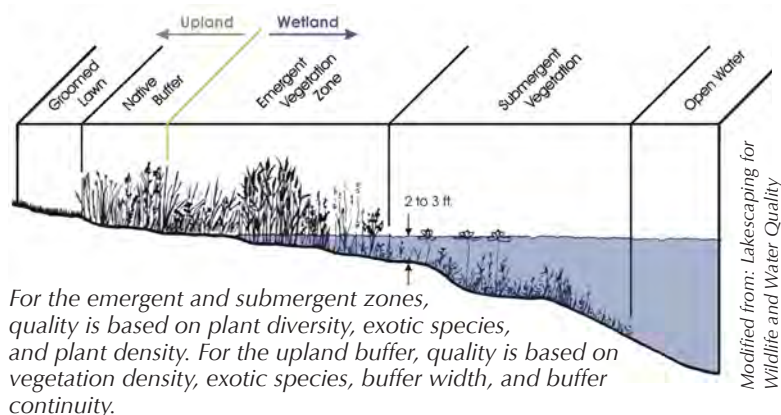


In recent years, the summer averages of Secchi disc transparency and total phosphorus in Crystal Lake have regularly met MPCA standards. The summer-average total phosphorus has been better than the MPCA standard for the past 12 years. The summer-average Secchi disc transparency has been better than the MPCA water quality standard 12 of the last 13 years. The Minnesota Pollution Control Agency (MPCA) removed Crystal Lake from the list of impaired waterbodies for eutrophication in 2018 due to more than a decade of good water quality, and the Environmental Protection Agency (EPA) approved the MPCA's decision in January 2019.

The BDWMO will continue to monitor the water quality of Crystal Lake in 2019. The BDWMO also performed habitat monitoring for Crystal Lake in 2018 (see story on page 7); the next Crystal Lake habitat monitoring is scheduled for 2023.

Habitat Monitoring Program

In 2002, the BDWMO created a program for monitoring the wildlife and fish habitat quality of strategic water resources in the watershed, including biological and physical indicators, such as upland and aquatic vegetation, buffer zones, erosion, sedimentation, and the presence of non-native exotic species. The program also recommends management actions based upon monitoring results.



In 2018, the BDWMO and the City of Burnsville monitored the habitat quality of Crystal Lake. Monitoring included transect, plot, and meandering surveys in, within, and along the fringe of Crystal Lake (in the submergent, emergent, and upland buffer zones). Photographs were taken to document conditions. Analysis and reporting of the monitoring data included a floristic quality assessment and a four-tiered rating system (poor, moderate, high, and excellent). Private versus public ownership was identified along the shoreline. The BDWMO used the survey results, along with parcel data, to identify possible locations for restoration and preservation.

The City of Burnsville conducts annual harvesting of curlyleaf pondweed to control this invasive species. Eurasian watermilfoil was also found in Crystal Lake in 2018 and in previous years. Eurasian watermilfoil has fast growing stems and often branches out and covers the water surface, which impedes boating, makes water recreation difficult, and often shades out slower-growing native plants.

See page 7 for Crystal Lake habitat monitoring results. See the BDWMO's website at www.blackdogwmo.org for the full report.

Water Quality Monitoring Program

The BDWMO and member cities continued to monitor several of its lakes during 2018 through the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP) to detect any water quality changes that would require management action by the WMO. In addition, the BDWMO conducted more detailed monitoring on Crystal Lake (see page 4). The monitoring focused on three water quality indicators—total phosphorus and chlorophyll-*a* concentrations, plus Secchi disc transparency. All three variables correlate strongly to the open-water nuisance conditions of lakes (i.e., algal blooms).

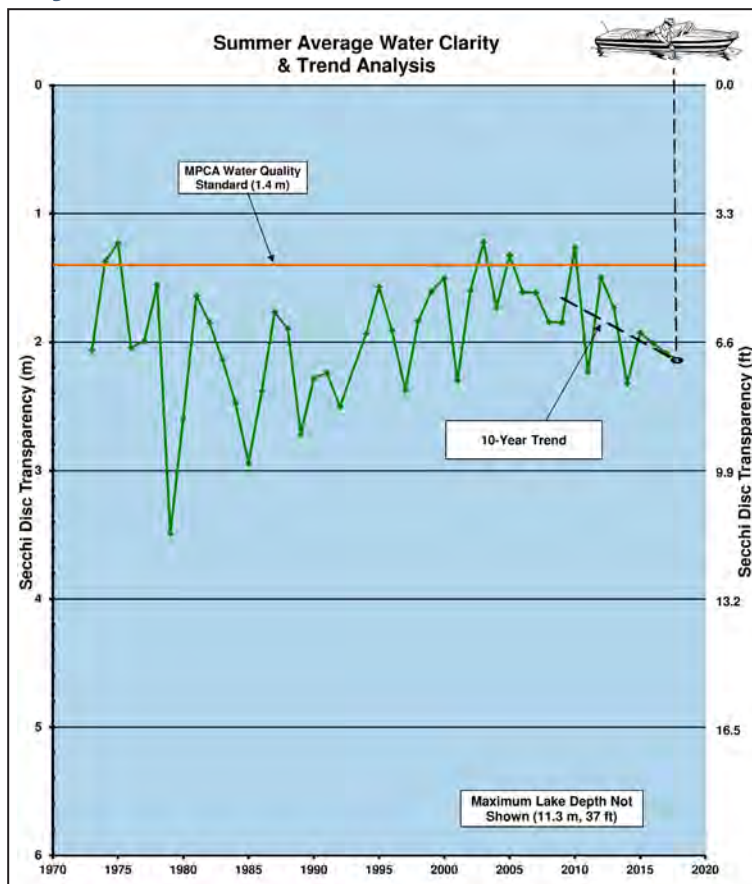
Long-term monitoring is important because lakes can change from year to year. Only when several years of data are compiled do trends become apparent. Because the MPCA periodically evaluates water quality data from the most recent ten-year period to determine if a lake violates applicable water quality standards, the WMO has adopted the same time convention for conducting its annual trend analyses. Graphs on this page and subsequent pages show historic trends in water quality.

Crystal Lake Water Quality Monitoring—In 2018, the BDWMO performed more detailed management level monitoring on the lake (see story on page 4). Habitat monitoring was also performed in 2018 (see page 7 for results).

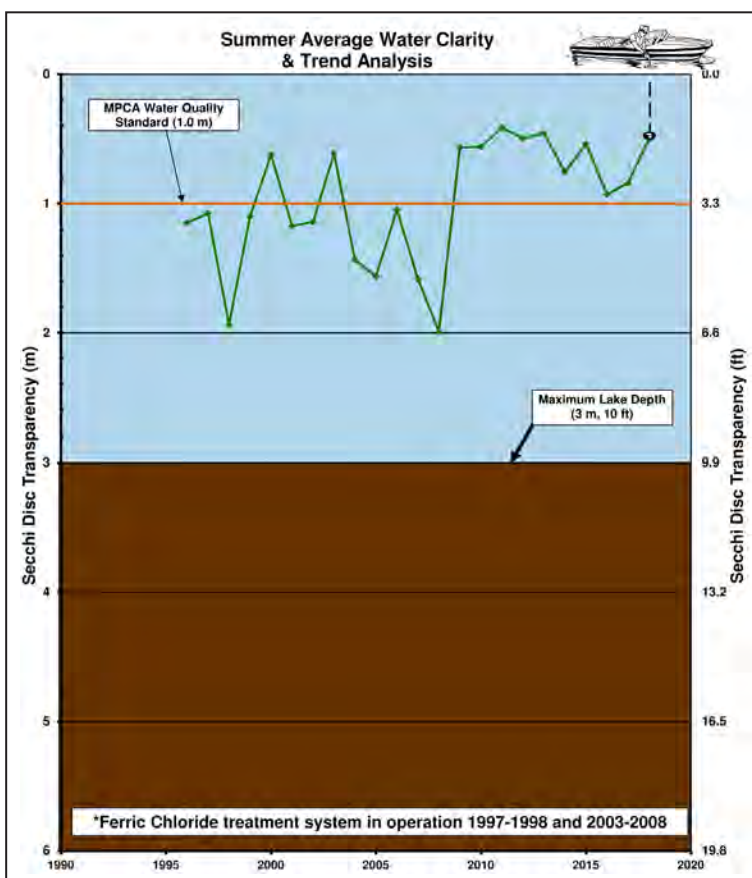
Keller Lake Water Quality Monitoring—The 2018 Secchi disc transparency summer average was 0.50 meters (1.6 feet) which was worse than the 2017 summer-average, and is worse than the MPCA's shallow lake standard of 1.0 meter (3.3 feet). The 2018 summer-average of chlorophyll-*a* (33 µg/L) was also worse than the MPCA's shallow lake standard of 20 µg/L. The summer-average total phosphorus (99 µg/L) was worse than the 2017 summer-average, and was worse than the MPCA shallow lake standard of 60 µg/L.

Trend analyses were not completed for Keller Lake because there is less than 10 years of data since the ferric chloride treatment system was permanently shut down (end of 2009). Water quality has generally degraded since the shutdown of the ferric chloride system. The three-lake TMDL study and implementation plan identifies the water quality improvement measures needed to achieve the BDWMO and MPCA goals for the lake. The BDWMO will implement an alum treatment on Keller Lake in 2019 (see story on page 2). The BDWMO will continue to monitor the water quality of Keller Lake in 2019. Habitat monitoring is scheduled for Keller Lake in 2020.

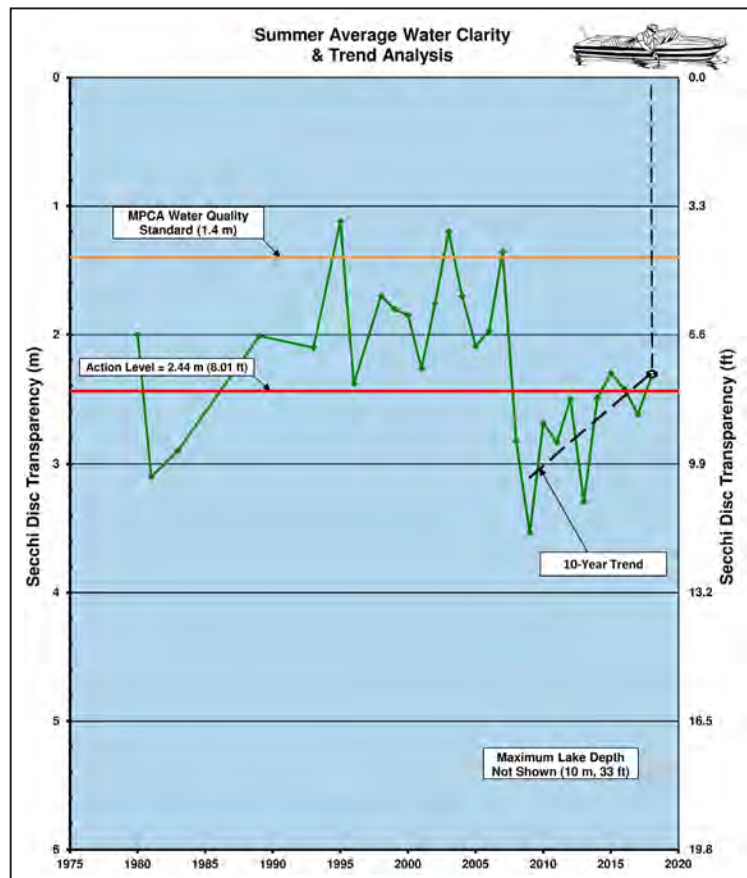
Crystal Lake (Burnsville & Lakeville)



Keller Lake (Burnsville & Apple Valley)



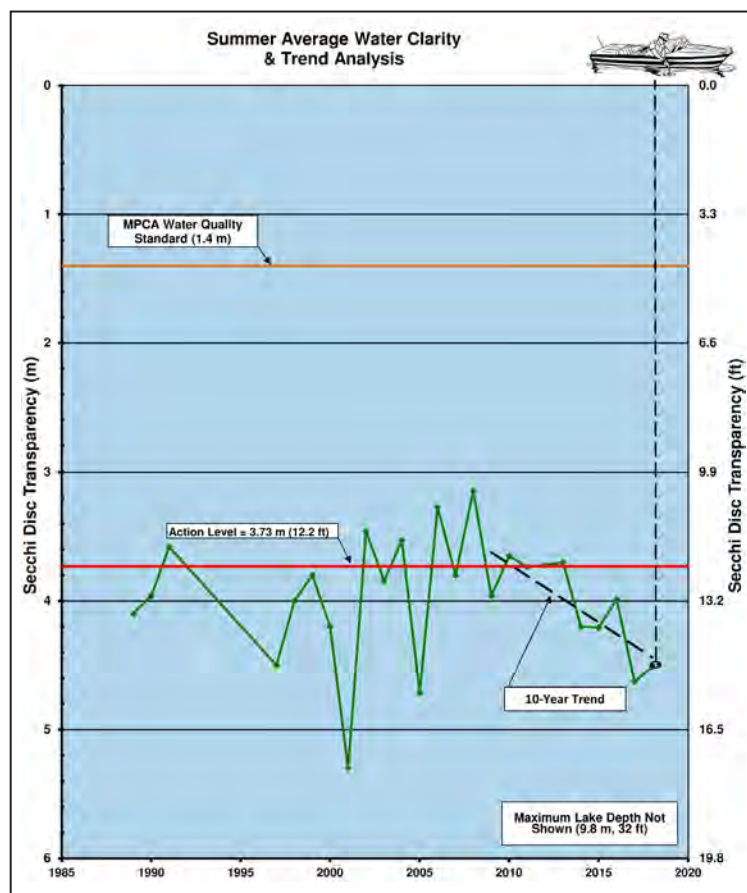
Orchard Lake (Lakeville)



Water Quality Monitoring—The 2018 summer-average Secchi disc transparency was 2.3 meters (7.6 feet), which is worse than the 2017 summer average but better than the MPCA deep-lake water quality standard of 1.4 meters. The 2018 summer average of total phosphorus (23 µg/L) was worse than the 2017 summer average, but is better than the MPCA's deep lake standard. The summer-average chlorophyll-a (5.3 µg/L) was similar to the 2017 summer average, and is better than the MPCA's deep lake standard. The BDWMO will continue to monitor the water quality of Orchard Lake in 2019. Habitat monitoring is scheduled for Orchard Lake in 2022.



Lac Lavon (Apple Valley & Burnsville)

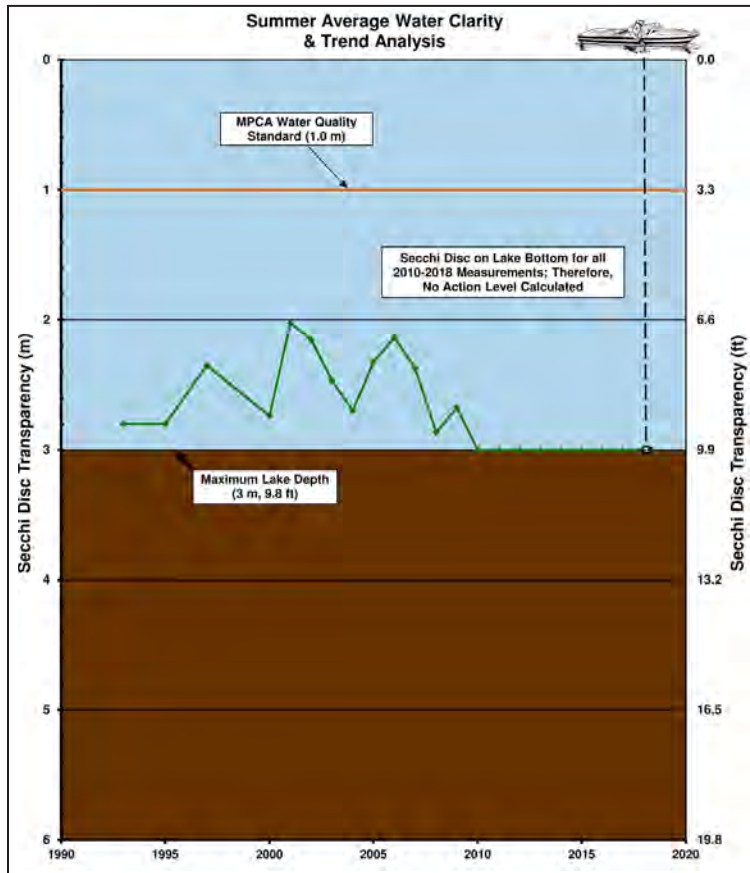


Water Quality Monitoring—The 2018 summer-average Secchi disc transparency was 4.5 meters (15 feet), which indicates continued excellent water quality. It was one of the highest summer averages on record (although the 2017 summer average was even higher). The 2018 summer averages of total phosphorus (11 µg/L) and chlorophyll-a (2.6 µg/L) further indicate excellent water quality for Lac Lavon. Summer averages of Secchi disc transparency show a statistically significant improving trend for the most recent 10-year period of 2009-2018. There was no significant trend in summer averages of total phosphorus or chlorophyll-a for the same period. The BDWMO will continue to monitor the water quality of Lac Lavon; in 2019, this includes management level monitoring that is conducted every 3 years. Habitat monitoring is also scheduled for Lac Lavon in 2019.



2018 Monitoring Results

Kingsley Lake (Lakeville)

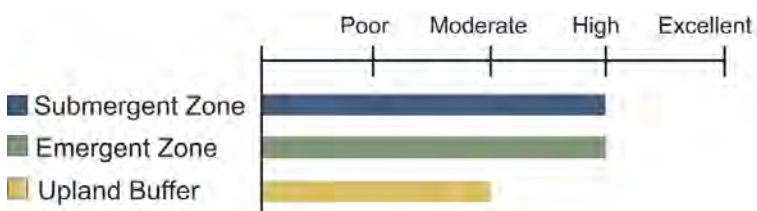


Water Quality Monitoring—Water quality monitoring data from 2018 show continued excellent water quality in Kingsley Lake. Water is often clear enough that the Secchi disc used to measure transparency can still be seen when resting on the bottom of the lake.* The 2018 summer averages of total phosphorus (15 µg/L) and chlorophyll-a (3.3 µg/L) concentrations in 2018 were similar to years 2015-2017, and are considerably better than the MPCA's shallow lake standards. The BDWMO will continue to monitor the water quality of Kingsley Lake in 2019. Habitat monitoring is scheduled for Kingsley Lake in 2021.

* Secchi disc readings in Kingsley Lake are difficult because lake vegetation obscures the Secchi disc, giving false measurements; therefore, there is no trend line in the graph above.

Crystal Lake Habitat Monitoring Results for 2018

As mentioned in the article on page 4, Crystal Lake habitat monitoring was conducted in 2018. The BDWMO made the following quality ratings, based on the monitoring results:



**Exotic plant species in upland buffer include garlic mustard, burdock, knapweed, leafy spurge, honeysuckle, bird's foot trefoil, sweet clover, buckthorn, Kentucky bluegrass, and Siberian elm.

Submergent zone quality rating = High

Rating based on averaging four criteria:

1. excellent total number of native species (15)
2. excellent average native plant density (1.2)
3. moderate rating for average exotic species density (1.2)
4. moderate coefficient of conservatism value (mean C-value) (5.0)

Curlyleaf pondweed (common every year in the lake in early spring) often out-competes native vegetation early in the growing season and dies off in early to mid-summer. This creates a sudden loss of habitat and releases nutrients into the water that can produce algal blooms and create turbid water conditions. The City of Burnsville conducts annual harvesting of curlyleaf pondweed to control this invasive species. Eurasian watermilfoil was also found in Crystal Lake in 2018 and in previous years. Eurasian watermilfoil has fast growing stems and often branches out and covers the water surface, which impedes boating, makes water recreation difficult, and often shades out slower-growing native plants.

The BDWMO recommends continued monitoring and control of these invasive species.

Emergent vegetation zone quality rating = High

Rating based on averaging four criteria:

1. excellent number of native plant species (50)
2. high rating for % coverage of exotic species (26-50%)
3. a moderate mean C-value rating (3.3)
4. moderate rating for total vegetative cover (26-50%)

The shallow marsh areas within Crystal Lake West Park are dominated by non-native cattails; however native species including sedges, rushes, bur-reed, arrowhead, swamp milkweed, cardinal flower, and blue vervain also present in the emergent zone provide valuable diverse wildlife habitat. Purple loosestrife is another invasive species with little wildlife value found in the lake's emergent zone.

The BDWMO recommends continued management of purple loosestrife where feasible.

Upland buffer zone quality rating = Moderate

- 54 native species and 20 exotic species observed
- Exotic plant species** 15-40% of upland vegetative cover. Native plants with high C-values: white prairie clover, lance-leaf twisted stalk, birch, and oaks.
- Upland buffer around the lake averages <10' wide and surrounds 26-50% of the lake, which is insufficient to protect water quality, prevent erosion, and provide wildlife habitat.
- Most of the residential properties were identified as having the potential to increase naturalized upland buffer widths to provide some level of benefit to protect water quality and prevent erosion (25'). A few residential and city-owned properties have the potential to increase the buffer width to provide wildlife habitat (100'). Several shoreline restoration projects have been completed.
- Lakeshore property owners are encouraged to apply for funds (see page 3) to assist with implementation of the BDWMO recommendations.



Black Dog Watershed Management Organization

Board of Commissioners

Representing Burnsville:

Roger Baldwin, Chair
(serving since 1996)
Tom Harmening, Commissioner
(serving since 2002)
Mike Hughes, Commissioner
(serving since 2008)
Curtis Enestvedt, Alternate
(serving since 2014)

Representing Apple Valley and Eagan:

Greg Helms, Vice Chair
(serving since 2011)
Rollie Greeno, Alternate
(serving since 2018)

Representing Lakeville:

Scott Thureen, Secretary/Treasurer
(serving since 2008)
Vacant, Alternate

Engineering Consultant:

Karen Chandler, P.E., Barr Engineering Co.

Legal Consultant:

Roger Knutson, Campbell Knutson, P.A.

Regular board meetings . . .

are held at 5:00 p.m. on the third Wednesday of the month at the Burnsville Maintenance Facility at 13713 Frontier Court.

For more information, please contact:

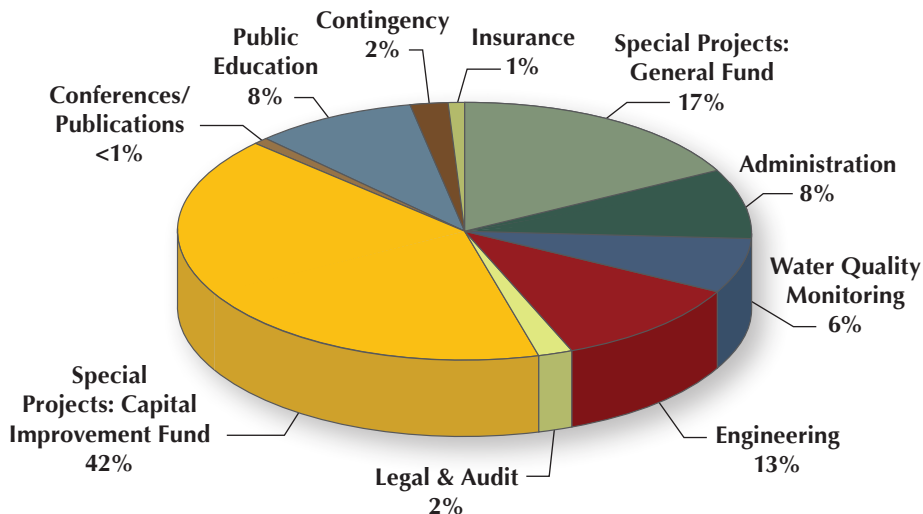
Daryl Jacobson, Administrator
Black Dog WMO
City of Burnsville
13713 Frontier Court
Burnsville, MN 55337
Telephone: 952-895-4574
Fax: 952-895-4531

Website: www.blackdogwmo.org

2019 Expenditures

Engineering	\$31,000
Legal and Audit	\$4,400
Administrative Services	\$18,000
Public Education	\$17,900
Insurance	\$3,000
Special Projects – General Fund	\$39,200
Special Projects – Capital Improvement Fund	\$96,700
Conference/Publications	\$500
Water Quality Monitoring	\$14,900
Contingency	\$5,000

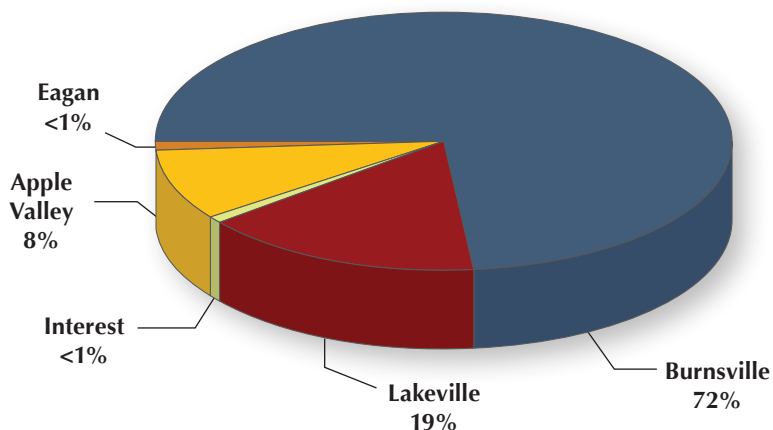
Total Expenditures \$230,600



2019 Income

Member Contributions	\$153,000
Interest	\$40

Total Income \$153,040



NOTE: Difference between expenditures and income (\$77,560) to come out of Fund Balance

2018 Water Quality Data

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The Black Dog WMO funds the water quality monitoring of its water bodies designated as “strategic” by the Black Dog WMO. In 2018, the strategic water bodies included:

1. Crystal Lake
2. Keller Lake
3. Kingsley Lake
4. Lac Lavon
5. Orchard Lake

Some of the water quality data for the strategic water bodies is presented on the following pages. First are a series of figures that summarize the historical summer average (June 1 through September 30) total phosphorus, chlorophyll *a*, and Secchi disc transparency data. The figures also display the trend lines for the past 10 years’ water quality data, if a trend was observed. The linear best-fits were determined using a “least squares” regression analysis of the summer averages of the past 10 years (2009—2018) of data. Trend analyses were not performed for Keller Lake because there is less than 10 years of monitoring data since shutdown of the ferric chloride treatment system at the end of 2009. The 2018 CAMP data provided by the Metropolitan Council were preliminary data at the time this report was prepared.

Second are a series of tables that show the results of the water quality monitoring for each data collection date in 2018.

Water quality monitoring data is also available for other “non-strategic” water bodies in the Black Dog WMO. In 2018, the member cities funded participation in the CAMP program for the following non-strategic water bodies

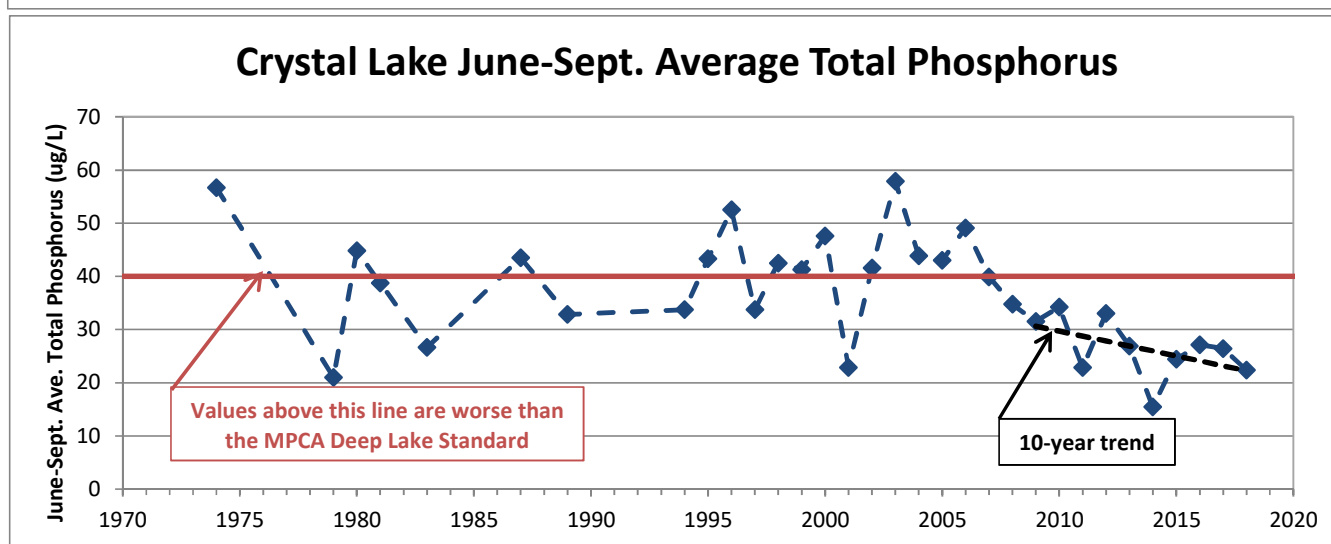
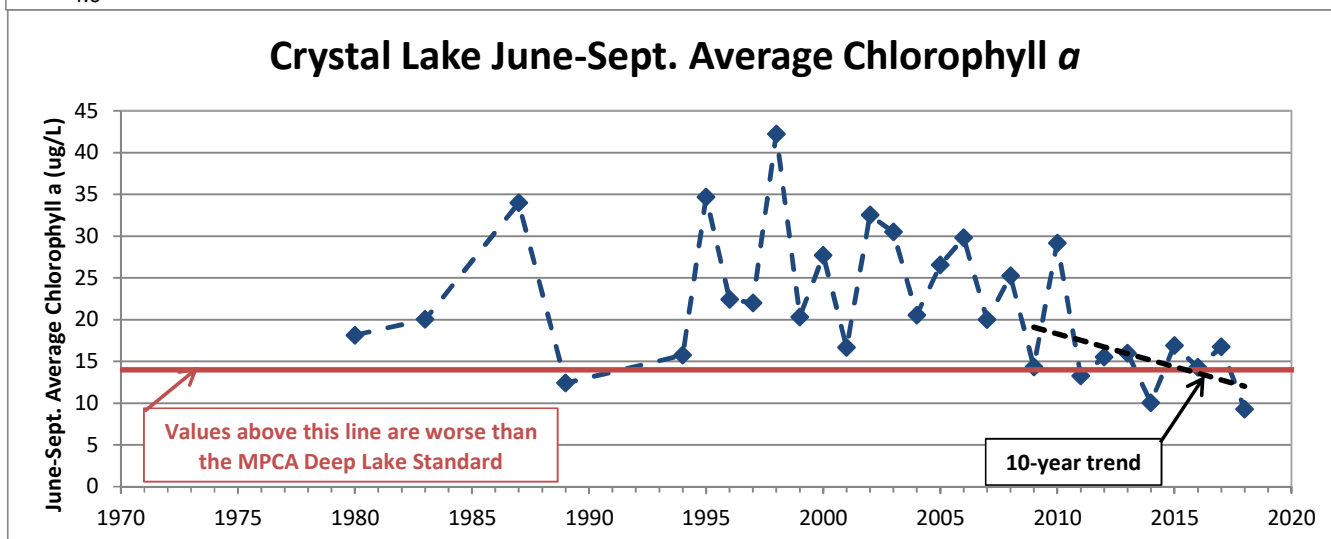
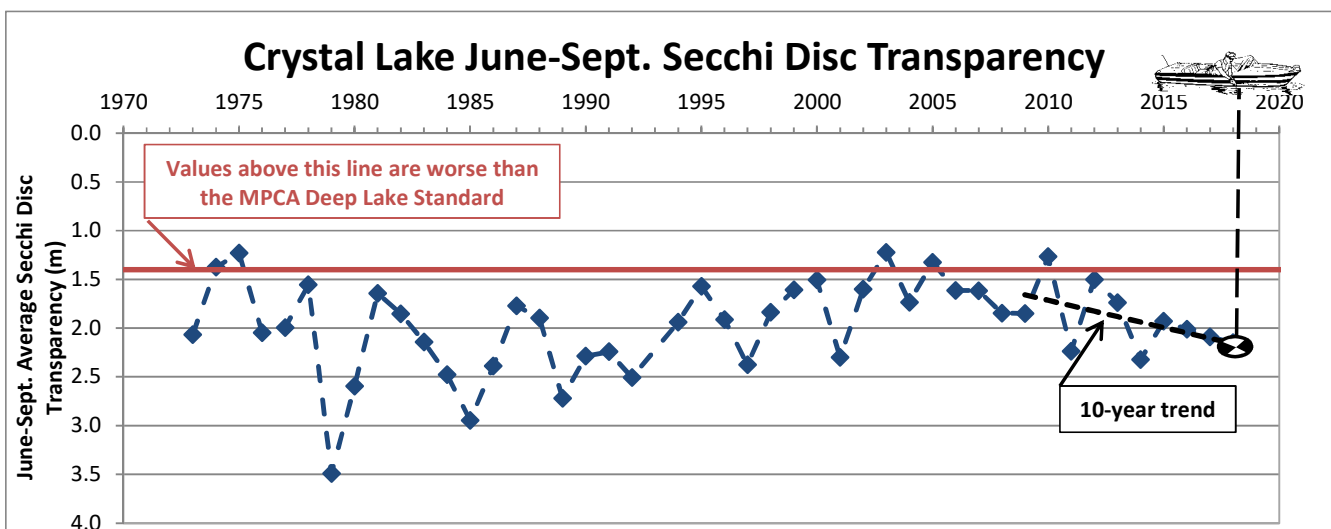
- Earley Lake (City of Burnsville)
- Twin Lake (City of Burnsville)
- Sunset Pond (City of Burnsville)
- Wood Pond (City of Burnsville)
- Lee Lake (City of Lakeville)

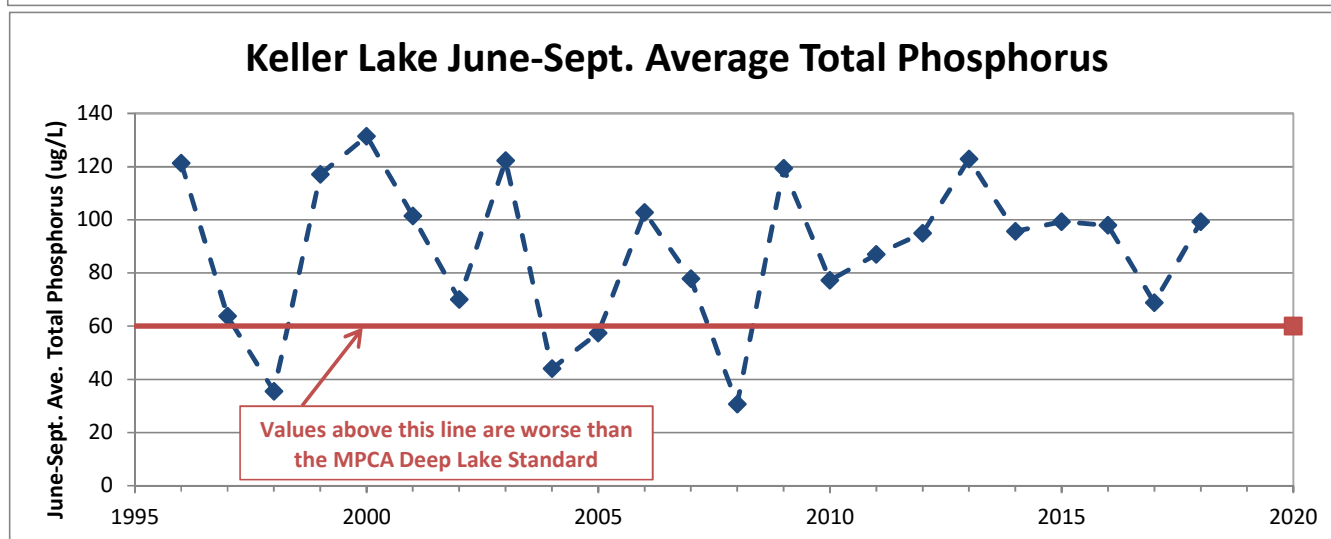
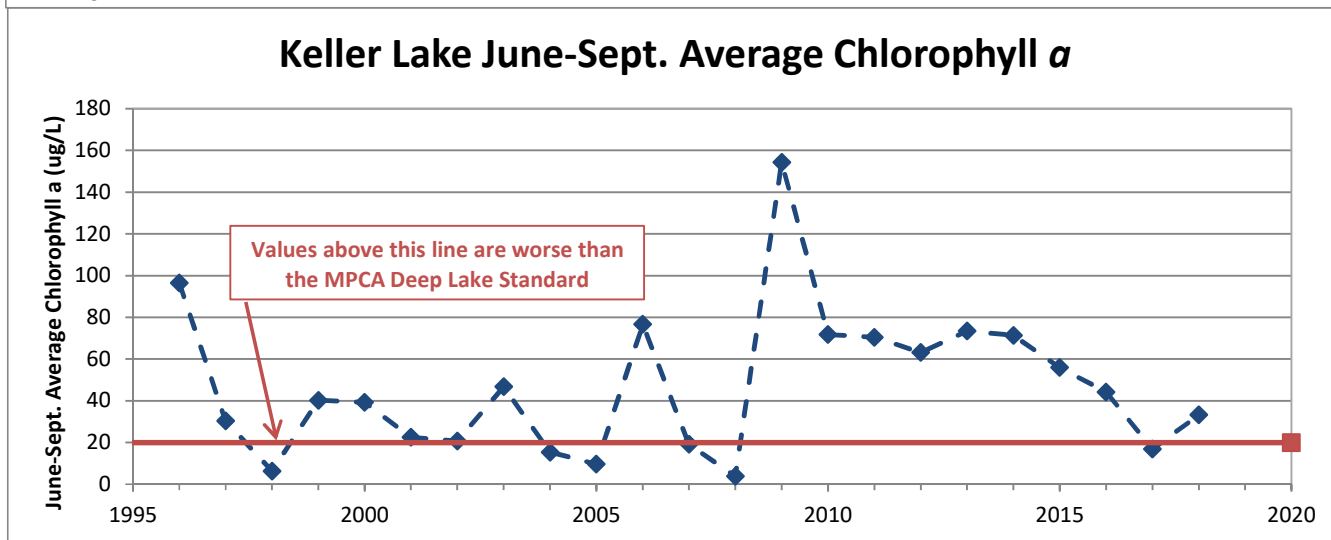
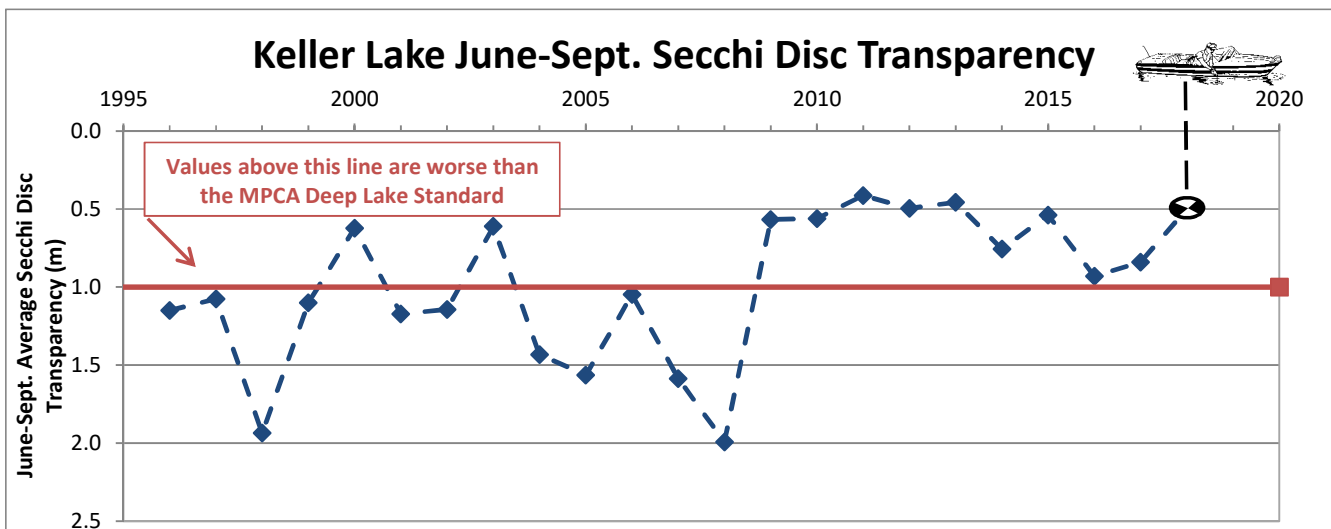
Results of the 2018 water quality monitoring of these water bodies is available from the Metropolitan Council’s CAMP program.

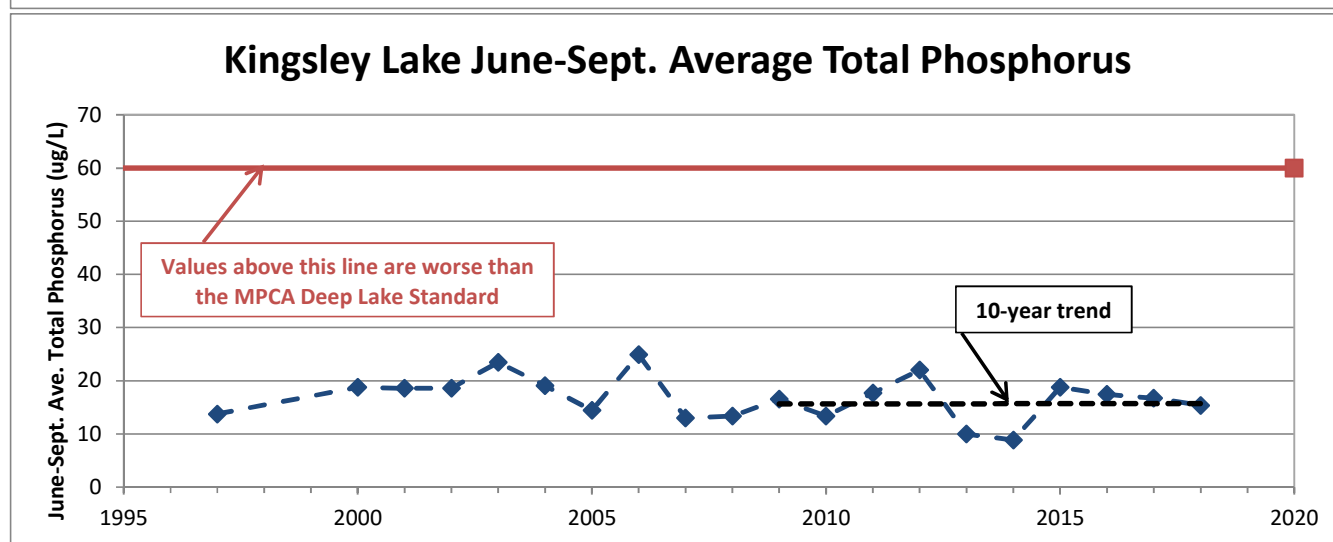
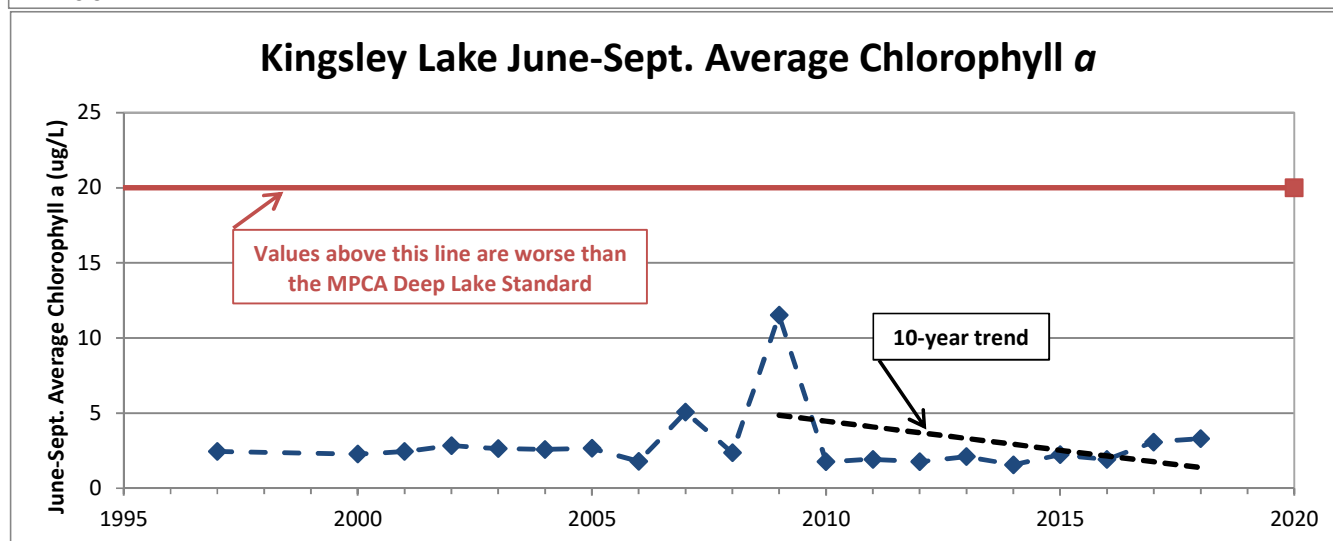
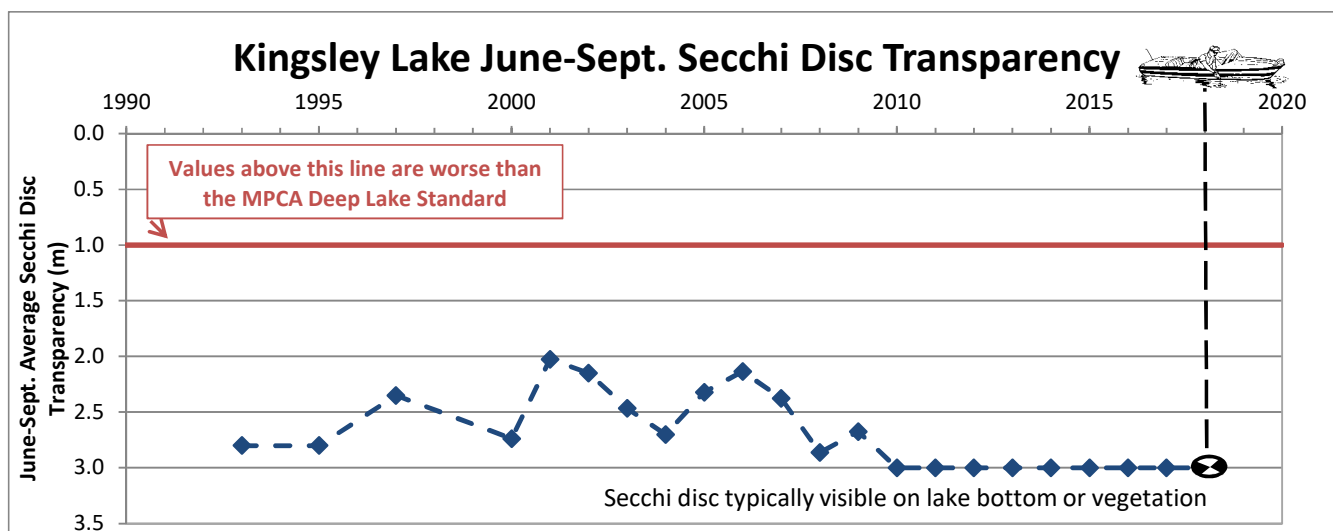
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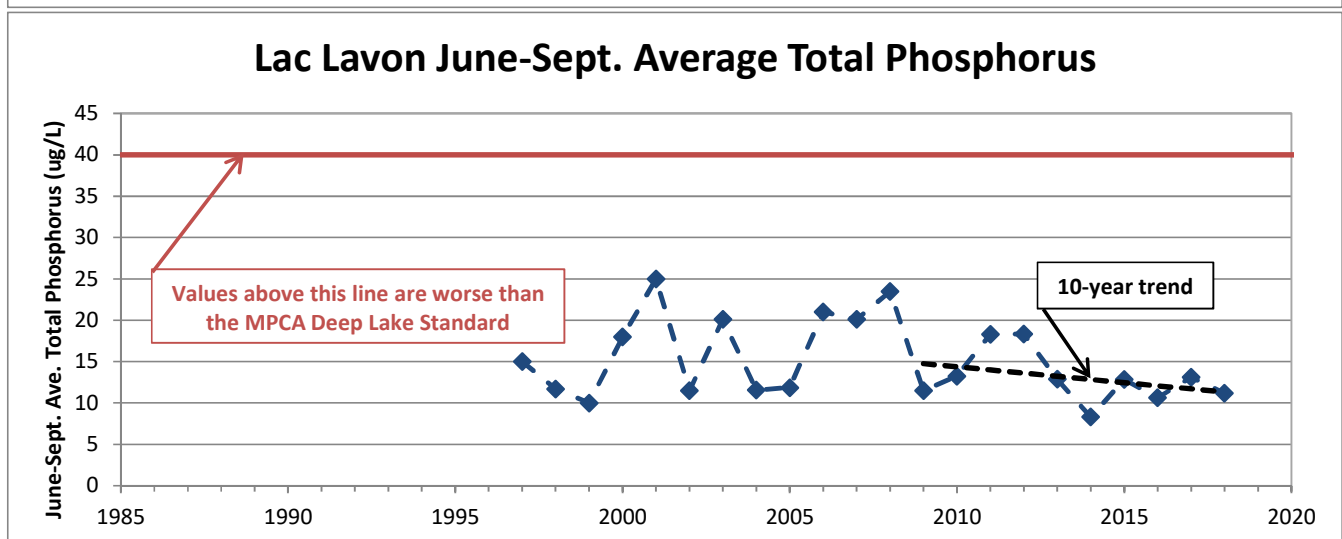
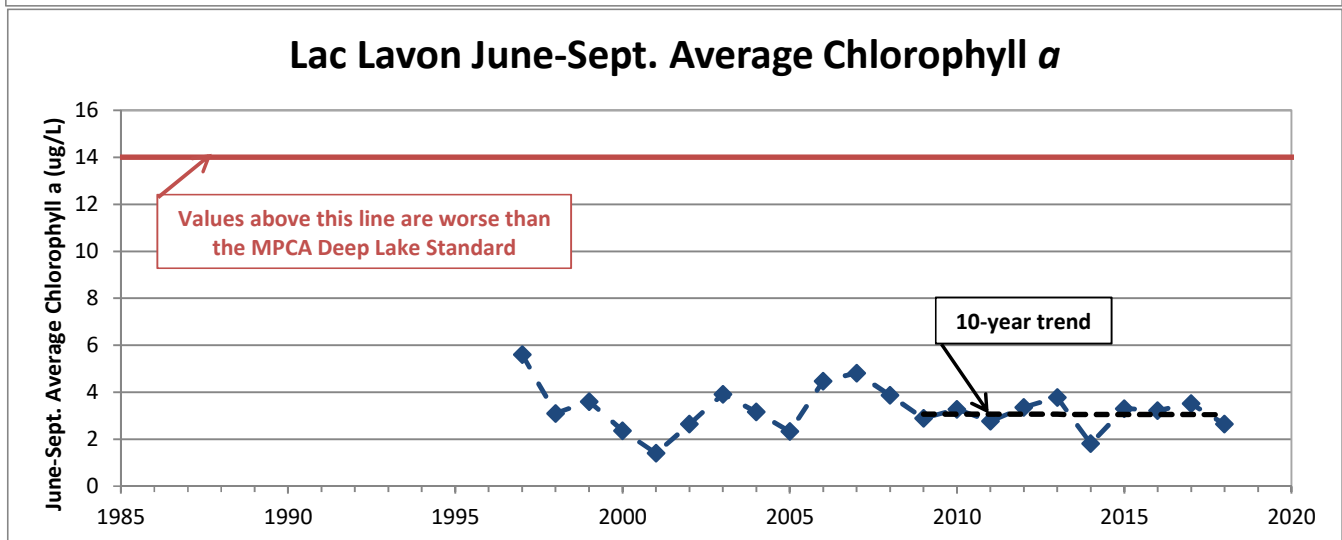
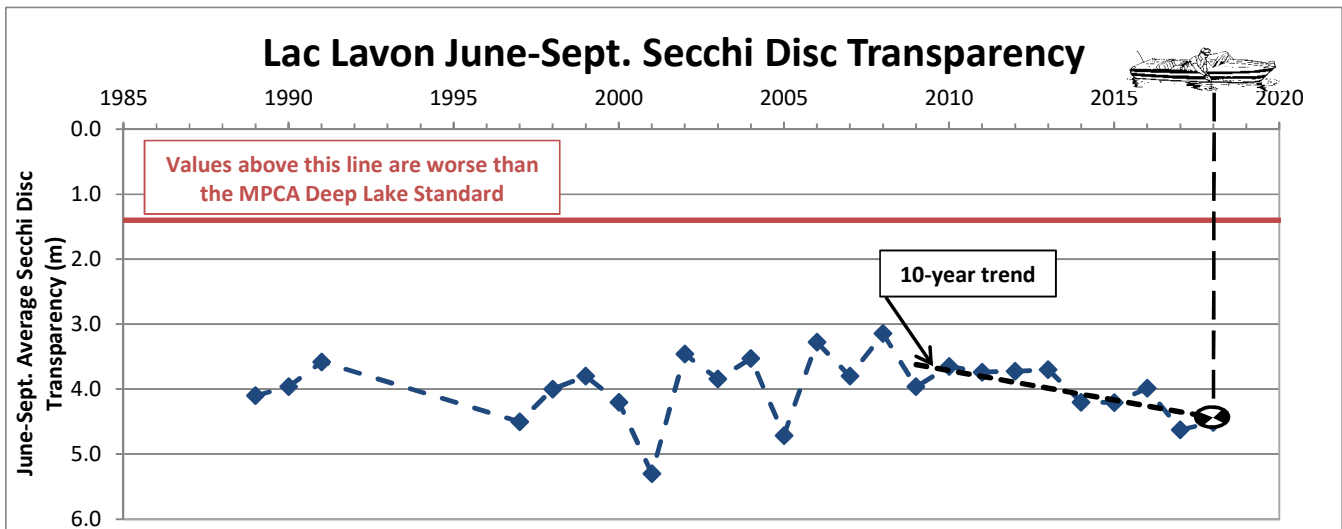
Historical Water Quality Data—Figures

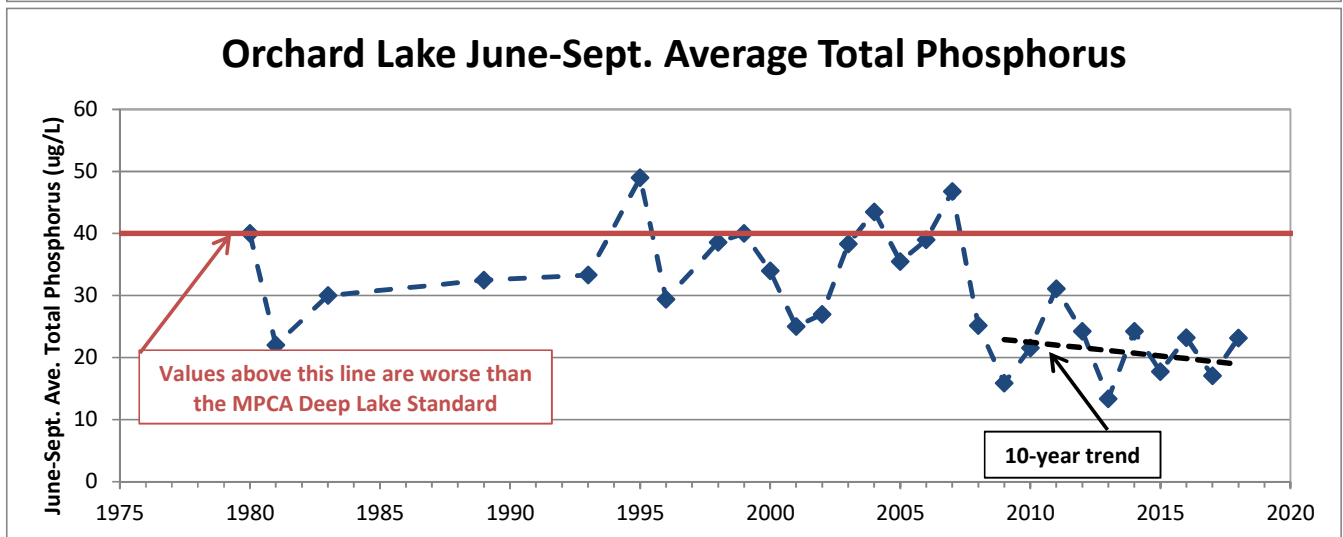
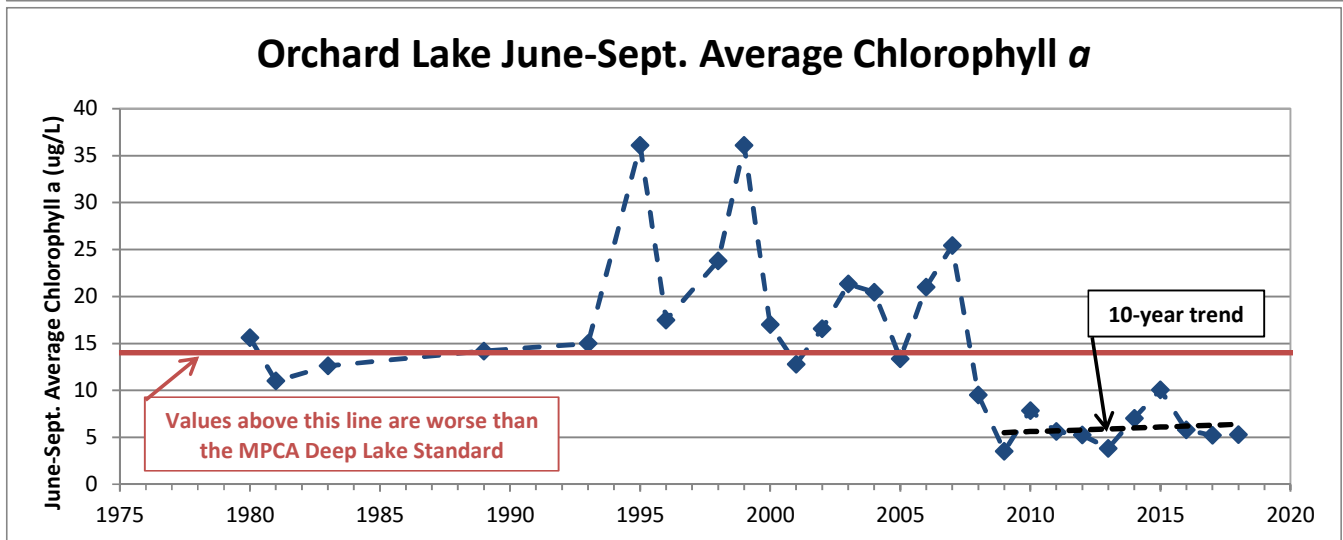
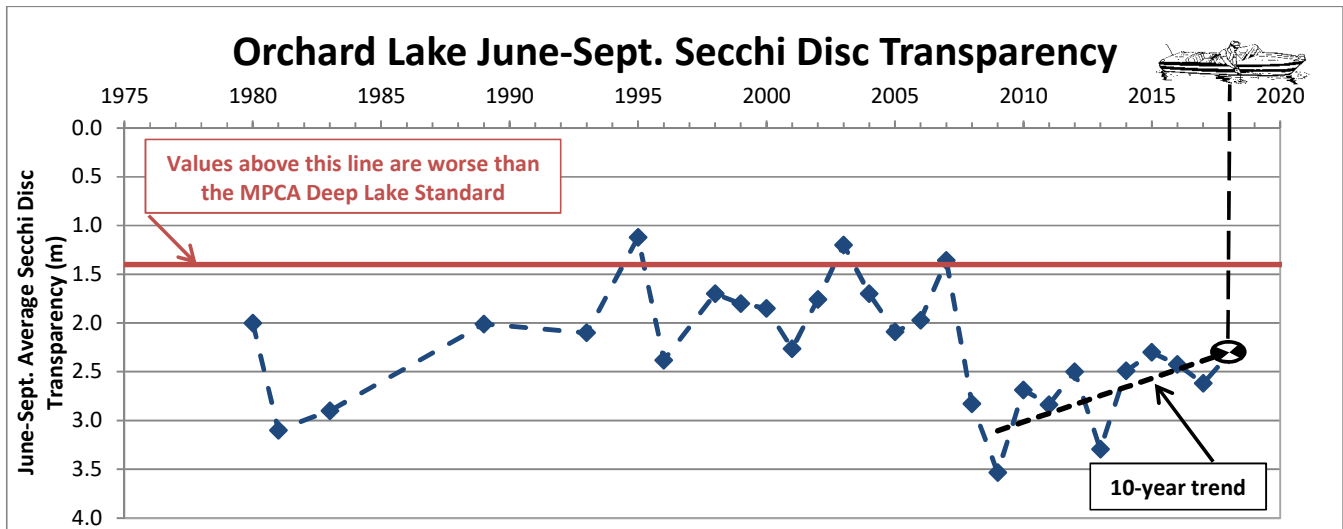
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2018 Water Quality Data—Tables

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**Table 1: Crystal Lake 2018 Water Quality Data
Citizen-Assisted Monitoring Program**

Date & Time	Sample Depth (m)	Secchi Disc Transparency (m)	Chlorophyll-a, Pheophytin Corrected (µg/L)	Total Phosphorus (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Temperature (°C)	Comment
5/6/18 10:00	0	2.9	5.3	0.017	0.65	15.7	
5/16/18 11:00	0	3.2	3.2	0.015	0.57	17.8	
5/16/18 11:00	0	--	--	0.017	0.54	--	field replicate
5/30/18 15:15	0	4.0	5.8	0.030	0.50	24.8	
6/13/18 15:15	0	3.0	5.7	0.013	0.61	22.1	
6/27/18 15:00	0	2.9	5.1	0.029	0.62	24.9	
6/27/18 15:00	0	--	--	0.017	0.59	--	field replicate
7/14/18 14:00	0	2.0	11	0.031	0.58	27.4	
7/27/18 12:55	0	2.0	11	0.023	0.59	24.0	
8/8/18 15:00	0	2.3	10	0.018	0.63	25.3	
8/21/18 11:00	0	1.9	13	0.032	0.73	25.3	
8/21/18 11:00	0	--	--	0.020	0.47	--	field replicate
9/5/18 13:15	0	2.5	10	0.027	0.50	22.9	
9/23/18 11:30	0	1.8	11	0.025	0.68	19.4	
10/3/18 8:45	0	1.4	23	0.029	0.76	14.2	
10/18/18 10:30	0	2.3	12	0.068	0.85	8.7	

Table 2: Crystal Lake 2018 Water Quality Measured by Barr Engineering

Date	Sample Depth	Field Measurements						Laboratory Analyses	
		Secchi Disk Transparency [m]	Dissolved Oxygen [mg/l]	pH	Specific Conductance @ 25 °C [umhos/cm]	Water Temperature [°C]	Turbidity [NTU]	Chlorophyll-a, Pheophytin Corrected [µg/l]	Total Phosphorus [µg/l]
5/14/2018	0-2	3.1	--	--	--	--	2.1	2.9	24
5/14/2018	0.0	--	10.5	7.90	618	16.2	--	--	--
5/14/2018	1.0	--	10.5	8.00	618	16.2	--	--	--
5/14/2018	2.0	--	10.6	8.10	617	15.2	--	--	--
5/14/2018	3.0	--	10.6	8.10	615	14.6	--	--	24
5/14/2018	4.0	--	9.7	8.00	620	13.9	--	--	25
5/14/2018	5.0	--	7.8	7.40	745	7.9	--	--	31
5/14/2018	6.0	--	0.7	7.20	800	6.2	--	--	45
5/14/2018	7.0	--	0.5	7.10	846	5.5	--	--	41
5/14/2018	8.0	--	0.4	7.00	867	5.4	--	--	25
5/29/2018	0-2	3.3	--	--	--	--	1.5	2.8	18
5/29/2018	0.0	--	9.6	8.27	637	24.8	--	--	--
5/29/2018	1.0	--	9.5	8.29	638	24.8	--	--	--
5/29/2018	2.0	--	9.5	8.28	638	24.7	--	--	--
5/29/2018	3.0	--	9.5	8.29	639	24.7	--	--	19
5/29/2018	4.0	--	9.6	7.62	656	16.0	--	--	29
5/29/2018	5.0	--	8.3	7.37	721	12.1	--	--	27
5/29/2018	6.0	--	2.1	7.07	796	8.1	--	--	43
5/29/2018	7.0	--	0.11	7.03	837	6.1	--	--	60
5/29/2018	8.0	--	0.14	7.07	876	5.8	--	--	68
6/11/2018	0-2	2.2	--	--	--	--	4.0	9.2	17
6/11/2018	0.0	--	9.0	8.50	628	21.4	--	--	--
6/11/2018	1.0	--	9.0	8.50	627	21.4	--	--	--
6/11/2018	2.0	--	9.0	8.50	629	21.4	--	--	--
6/11/2018	3.0	--	9.0	8.50	630	21.4	--	--	17
6/11/2018	4.0	--	8.9	8.50	629	21.4	--	--	29
6/11/2018	5.0	--	5.1	7.50	755	12.4	--	--	19
6/11/2018	6.0	--	2.3	7.20	789	9.8	--	--	22
6/11/2018	7.0	--	0.8	7.10	836	7.3	--	--	50
6/11/2018	8.0	--	0.2	7.00	865	6.4	--	--	78
6/25/2018	0-2	2.1	--	--	--	--	2.2	6.5	18
6/25/2018	0.0	--	8.8	8.24	627	24.3	--	--	--
6/25/2018	1.0	--	8.8	8.30	625	24.3	--	--	--
6/25/2018	2.0	--	8.7	8.30	626	24.3	--	--	--
6/25/2018	3.0	--	8.7	8.33	625	24.3	--	--	15
6/25/2018	4.0	--	8.7	7.98	631	23.3	--	--	16

Table 2: Crystal Lake 2018 Water Quality Measured by Barr Engineering

Date	Sample Depth	Field Measurements						Laboratory Analyses	
		Secchi Disk Transparency [m]	Dissolved Oxygen [mg/l]	pH	Specific Conductance @ 25 °C [umhos/cm]	Water Temperature [°C]	Turbidity [NTU]	Chlorophyll-a, Pheophytin Corrected [µg/l]	Total Phosphorus [µg/l]
6/25/2018	5.0	--	0.6	7.26	698	17.2	--	--	24
6/25/2018	6.0	--	0.6	6.99	796	11.2	--	--	20
6/25/2018	7.0	--	0.14	6.89	843	8.0	--	--	66
6/25/2018	8.0	--	0.08	6.87	877	6.9	--	--	130
7/16/2018	0-2	1.7	--	--	--	--	5.3	6.8	20
7/16/2018	0.0	--	8.3	8.40	626	27.3	--	--	--
7/16/2018	1.0	--	8.3	8.40	626	27.3	--	--	--
7/16/2018	2.0	--	8.3	8.40	625	27.3	--	--	--
7/16/2018	3.0	--	8.3	8.40	627	27.3	--	--	23
7/16/2018	4.0	--	1.6	7.60	637	25.6	--	--	50
7/16/2018	5.0	--	0.3	7.20	683	20.6	--	--	27
7/16/2018	6.0	--	0.4	7.00	793	13.0	--	--	59
7/16/2018	7.0	--	0.3	6.80	844	9.1	--	--	82
7/16/2018	8.0	--	0.0	6.80	882	7.5	--	--	350
7/30/2018	0-2	--	--	--	--	--	1.2	10.3	23
7/30/2018	0.0	--	8.9	8.34	639	24.3	--	--	--
7/30/2018	1.0	--	8.9	8.36	638	24.3	--	--	--
7/30/2018	2.0	--	8.9	8.37	638	24.2	--	--	--
7/30/2018	3.0	--	8.9	8.38	638	24.2	--	--	24
7/30/2018	4.0	--	5.9	8.02	645	23.8	--	--	26
7/30/2018	5.0	--	0.9	7.43	667	22.2	--	--	26
7/30/2018	6.0	--	0.3	7.06	798	14.4	--	--	55
7/30/2018	7.0	--	0.2	6.95	859	9.7	--	--	130
7/30/2018	8.0	--	0.0	6.97	894	8.2	--	--	380
8/13/2018	0-2	2.2	--	--	--	--	3.1	6.0	22
8/13/2018	0.0	--	9.4	8.10	638	26.8	--	--	--
8/14/2018	1.0	--	9.5	8.20	638	26.9	--	--	--
8/15/2018	2.0	--	9.5	8.30	640	26.9	--	--	--
8/16/2018	3.0	--	9.5	8.30	640	26.9	--	--	20
8/17/2018	4.0	--	5.6	7.80	646	24.5	--	--	26
8/18/2018	5.0	--	0.3	7.30	676	21.5	--	--	30
8/19/2018	6.0	--	0.3	6.90	790	16.2	--	--	55
8/20/2018	7.0	--	0.4	6.70	850	11.0	--	--	130
8/21/2018	8.0	--	0.1	6.60	905	8.6	--	--	470
8/27/2018	0-2	2.0	--	--	--	--	3.5	8.3	20
8/27/2018	0.0	--	8.0	8.00	650	23.8	--	--	--

Table 2: Crystal Lake 2018 Water Quality Measured by Barr Engineering

Date	Sample Depth	Field Measurements						Laboratory Analyses	
		Secchi Disk Transparency [m]	Dissolved Oxygen [mg/l]	pH	Specific Conductance @ 25 °C [umhos/cm]	Water Temperature [°C]	Turbidity [NTU]	Chlorophyll-a, Pheophytin Corrected [µg/l]	Total Phosphorus [µg/l]
8/27/2018	1.0	--	7.9	7.90	648	23.8	--	--	--
8/27/2018	2.0	--	7.9	8.10	647	23.8	--	--	--
8/27/2018	3.0	--	7.9	8.10	646	23.7	--	--	21
8/27/2018	4.0	--	7.6	8.10	646	23.6	--	--	22
8/27/2018	5.0	--	0.8	7.40	673	22.1	--	--	34
8/27/2018	6.0	--	0.3	7.00	801	15.9	--	--	36
8/27/2018	7.0	--	0.4	6.80	868	11.5	--	--	91
8/27/2018	8.0	--	0.3	6.70	920	9.1	--	--	310
9/10/2018	0-2	1.9	--	--	--	--	4.2	12.8	24
9/10/2018	0.0	--	8.3	7.80	643	21.6	--	--	--
9/10/2018	1.0	--	8.3	8.10	643	21.6	--	--	--
9/10/2018	2.0	--	8.4	8.20	644	21.6	--	--	--
9/10/2018	3.0	--	8.4	8.20	643	21.6	--	--	23
9/10/2018	4.0	--	8.4	8.20	642	21.6	--	--	23
9/10/2018	5.0	--	8.4	8.20	643	21.5	--	--	21
9/10/2018	6.0	--	0.6	7.50	738	19.2	--	--	26
9/10/2018	7.0	--	0.4	7.00	865	13.1	--	--	74
9/10/2018	8.0	--	0.5	6.80	934	9.4	--	--	280
9/24/2018	0-2	1.7	--	--	--	--	5.7	11.5	28
9/24/2018	0.0	--	7.05	7.87	633	19.2	--	--	--
9/24/2018	1.0	--	7.0	7.88	633	19.2	--	--	--
9/24/2018	2.0	--	7.0	7.90	633	19.2	--	--	--
9/24/2018	3.0	--	7.0	7.90	633	19.2	--	--	24
9/24/2018	4.0	--	6.7	7.89	629	19.1	--	--	24
9/24/2018	5.0	--	6.0	7.78	629	18.9	--	--	22
9/24/2018	6.0	--	4.8	7.59	620	18.5	--	--	24
9/24/2018	7.0	--	0.4	7.01	850	15.1	--	--	55
9/24/2018	8.0	--	0.4	6.91	928	11.1	--	--	350

**Table 3: Keller Lake 2018 Water Quality Data
Citizen-Assisted Monitoring Program**

Date & Time	Sample Depth (m)	Secchi Disc Transparency (m)	Chlorophyll-a, Pheophytin Corrected (µg/L)	Total Phosphorus (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Temperature (°C)	Comment
5/5/18 15:30	0	1.3	8.9	0.047	0.52	19.7	
5/15/18 17:00	0	0.9	4.8	0.052	0.72	21.5	
5/31/18 16:00	0	1.0	18.0	0.091	0.82	26.8	
6/11/18 18:00	0	--	31	0.066	1.1	24.4	
6/11/18 18:00	0	--	--	0.049	1.0	--	field replicate
6/30/18 6:00	0	0.9	10	0.082	0.89	27.8	
7/17/18 15:30	0	0.3	47	0.113	1.6	31.0	
7/28/18 12:00	0	0.3	6	0.111	1.3	25.0	
7/28/18 12:00	0	--	--	0.107	1.2	--	field replicate
8/13/18 18:00	0	0.3	41	0.117	1.7	31.00	
9/10/18 15:00	0	0.2	65	0.117	1.8	23.8	
10/21/18 16:30	0	2.2	5	0.031	1.1	8.6	

**Table 4: Kingsley Lake 2018 Water Quality Data
Citizen-Assisted Monitoring Program**

Date & Time	Sample Depth (m)	Secchi Disc Transparency (m)	Chlorophyll-a, Pheophytin Corrected (µg/L)	Total Phosphorus (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Temperature (°C)	Comment
5/16/18 15:00	0	+ 3.2	2.8	0.019	0.47	20.6	
5/29/18 8:45	0	+ 3.2	1.3	0.013	0.47	25.6	
6/12/18 9:00	0	+ 3.2	4.3	0.017	0.47	21.7	
6/27/18 9:50	0	+ 3.3	1.6	0.015	0.42	24.2	
7/9/18 9:30	0	+ 3.3	1.8	0.018	0.41	27.2	
7/27/18 9:20	0	+ 3.0	1.4	0.016	0.42	22.9	
8/8/18 10:50	0	+ 3.0	< 1.0	~ 0.009	0.32	25.1	
8/23/18 9:10	0	+ 3.0	2.3	0.012	0.30	22.8	
9/7/18 8:50	0	+ 3.1	10	0.019	0.41	21.2	
9/24/18 8:50	0	+ 3.1	4.1	0.017	0.36	18.2	
10/17/18 10:35	0	+ 3.1	2.8	0.016	0.39	8.3	

Notes

+ 2.8 Secchi disk was resting on vegetation or lake bottom.

< 1.0 Indicates result is below the method detection limit.

~ 0.009 Indicates result is above the method detection limit, but below the method reporting limit.

**Table 5: Lac Lavon 2018 Water Quality Data
Citizen-Assisted Monitoring Program**

Date & Time	Sample Depth (m)	Secchi Disc Transparency (m)	Chlorophyll-a, Pheophytin Corrected (µg/L)	Total Phosphorus (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Temperature (°C)	Comment
5/13/18 14:00	0	2.7	3.5	0.024	0.55	17.1	
5/21/18 14:15	0	4.5	1.7	0.02	0.58	20.4	
6/2/18 15:00	0	5.0	2.8	0.017	0.47	23.2	
6/17/18 15:00	0	4.2	1.7	0.013	0.46	24.7	
7/15/18 12:45	0	4.6	<1.0	0.011	0.44	28.4	
7/30/18 14:00	0	4.1	2.6	~0.009	0.43	25.0	
7/30/18 14:00	0	--	--	0.01	0.43	--	field replicate
8/12/18 12:30	0	4.6	1.7	0.011	0.44	27.2	
8/27/18 11:00	0	4.7	6.2	~0.008	0.47	22.8	
9/9/18 12:15	0	5.3	24.0	~0.009	0.51	22.5	
9/23/18 14:45	0	3.6	2.5	0.011	0.49	20.1	
10/10/18 14:00	0	2.6	3.6	0.02	0.57	11.5	
10/21/18 13:00	0	3.5	2.3	0.016	0.59	9.6	

Notes

< 1.0 Indicates result is below the method detection limit.

~ 0.009 Indicates result is above the method detection limit, but below the method reporting limit.

Table 6: Orchard Lake 2018 Water Quality Data, Citizen-Assisted Monitoring Program
Citizen-Assisted Monitoring Program

Date & Time	Sample Depth (m)	Secchi Disc Transparency (m)	Chlorophyll-a, Pheophytin Corrected (µg/L)	Total Phosphorus (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Temperature (°C)	Comment
5/16/18 16:30	0	3.1	1.5	0.016	0.72	19.6	
6/3/18 14:00	0	2.9	5.2	0.015	0.64	21.9	
6/11/18 8:45	0	2.2	6.5	0.025	0.58	20.9	
6/23/18 13:31	0	2.8	3.3	0.013	0.65	24.3	
7/9/18 20:10	0	2.4	2.6	0.112 *	0.76	27.8	
7/28/18 9:00	0	2.6	5.9	0.031	0.76	23.6	
8/21/18 8:20	0	1.8	4.3	0.019	0.56	24.6	
9/7/18 11:20	0	2.1	9.1	0.020	0.77	22.2	
9/22/18 17:50	0	1.8	5.5	0.039	0.92	18.8	
10/6/18 10:30	0	2.0	11.0	0.025	0.70	12.1	
10/17/18 15:45	0	2.9	8.2	0.019	0.83	7.8	

Notes

0.112* Result is flagged as suspect.

~ 0.009 Indicates result is above the method detection limit, but below the method reporting limit.

2018 Annual Finance Statement

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**BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION**

Board of Commissioners and Administrators
as of December 31, 2018

BOARD OF COMMISSIONERS

Roger Baldwin	Chair
Greg Helms	Vice Chair
Scott Thureen	Secretary/Treasurer/Commissioner
Tom Harmening	Commissioner
Mike Hughes	Commissioner
Curtis Enestvedt	Commissioner (Alternate)
Rolland Greeno	Commissioner (Alternate)

ADMINISTRATORS

Daryl Jacobson	Administrator
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BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Statement of Net Position
as of 12/31/2018

	Governmental Activities
	2018
Assets	
Cash and investments	470,657
Capital assets	
Buildings	37,600
Equipment	110,138
Less accumulated depreciation	(132,698)
Total capital assets, net of accumulated depreciation	15,040
Total assets	485,697
Liabilities	
Accounts payable	9,212
Due to other governmental units	18,114
Total liabilities	27,326
Net position	
Net investment in capital assets	15,040
Restricted for capital improvements	64,787
Unrestricted	378,543
Total net position	458,370
Total liabilities and net position	485,697

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BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Statement of Net Position
as of 12/31/2018

	<u>Governmental Activities</u>
	<u>2018</u>
Expenses	
General government	
System operations	110,550
Administrative services	35,964
Depreciation	<u>940</u>
Total program expenses	147,453
Revenues	
General government	
Charges for services	
Management fees	153,000
General revenues	
Interest earnings	<u>7,835</u>
Total revenues	<u>160,835</u>
Change in net position	13,382
Net position	
Beginning of year	<u>444,989</u>
End of year	<u><u>458,370</u></u>

BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Balance Sheet
Governmental Funds
as of 12/31/18

	General Fund	Capital Improvement Fund	Total Governmental Funds 2018
Assets			
Cash and investments	404,328	66,329	470,657
Liabilities			
Accounts payable	7,671	1,542	9,212
Due to other governmental units	18,114	-	18,114
Total liabilities	25,785	1,542	27,326
Fund balances			
Restricted for capital improvements	-	64,787	64,787
Unassigned	378,543	-	378,543
Total fund balances	378,543	64,787	443,330
Total liabilities, deferred inflows of resources, and fund balances	404,328	66,329	470,657

Amounts reported for governmental activities in the Statement of Net Position differ because:

Fund balances – governmental funds	443,330
Capital assets used in governmental activities are not financial resources and, therefore, are not reported as assets in governmental funds.	
Cost of capital assets	147,738
Less accumulated depreciation	(132,698)
Net position of governmental activities	458,370

BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Statement of Revenue, Expenditures, and Changes in Fund Balances
Governmental Funds
as of 12/31/18

	General Fund	Capital Improvement Fund	Total Governmental Funds 2018
Revenue			
Member assessments	131,000	22,000	153,000
Interest earnings	7,835	-	7,835
Total revenue	138,835	22,000	160,835
Expenditures			
General government			
System Operations			
Engineering	39,643	-	39,643
Special Projects	30,287	23,213	53,500
Insurance	2,606	-	2,606
Water quality monitoring	14,800	-	14,800
Administrative services			
Legal and audit	4,123	-	4,123
Administrative costs	16,259	-	16,259
Public education	15,533	-	15,533
Conferences, publications and reports	-	-	-
Contingency	49	-	49
Total expenditures	123,301	23,213	146,513
Net change in fund balances	15,534	(1,213)	14,322
Fund balances			
Beginning of year	363,009	66,000	429,009
End of year	378,543	64,787	443,330

Amounts reported for governmental activities in the Statement of Activities are different because:

Net change in fund balances – governmental funds	14,322
Capital outlays are reported as expenditures in governmental funds, but are allocated over the estimated useful lives of the capital assets as depreciation expense in the Statement of Activities.	
Depreciation expense	(940)
Change in net position of governmental activities	13,382

BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Statement of Revenue, Expenditures, and Changes in Fund Balances
Budget and Actual
General Fund
as of 12/31/18

	2018		
	Original and Final Budget	Actual	Over (Under) Final Budget
Revenue			
Management fees	131,000	131,000	-
Interest earnings	40	7,835	7,795
Total revenue	131,040	138,835	7,795
Expenditures			
General government			
System Operations			
Engineering	31,000	39,643	8,643
Special Projects	34,700	30,287	(4,413)
Insurance	3,000	2,606	(394)
Water quality monitoring	14,550	14,800	250
Administrative services			
Legal and audit	4,400	4,123	(277)
Administrative costs	18,000	16,259	(1,741)
Public education	18,675	15,533	(3,142)
Conferences, publications and reports	500	-	(500)
Contingency	5,000	49	(4,951)
Total expenditures	129,825	123,301	(6,524)
Net change in fund balances	1,215	15,534	14,319
Fund balances			
Beginning of year		363,009	
End of year		378,543	

BLACK DOG WATERSHED
MANAGEMENT ORGANIZATION

Statement of Revenue, Expenditures, and Changes in Fund Balances
Budget and Actual
Capital Improvement Fund
as of 12/31/18

	2018		
	Original and Final Budget	Actual	Over (Under) Final Budget
Revenue			
Management fees	22,000	22,000	-
Interest earnings	-	-	-
Total revenue	22,000	22,000	-
Expenditures			
General government			
System Operations			
Engineering	-	-	-
Special Projects	33,000	23,213	(9,787)
Insurance	-	-	-
Water quality monitoring	-	-	-
Administrative services			
Legal and audit	-	-	-
Administrative costs	-	-	-
Public education	-	-	-
Conferences, publications and reports	-	-	-
Contingency	-	-	-
Total expenditures	33,000	23,213	(9,787)
Net change in fund balances	(11,000)	(1,213)	9,787
Fund balances			
Beginning of year		66,000	
End of year		64,787	