



2017



ANNUAL REPORT



VADNAIS LAKE AREA
WATER
MANAGEMENT
ORGANIZATION



Vadnais Lake Area Water Management Organization (VLAWMO)

800 East County Road E

Vadnais Heights, Minnesota 55127

Website: www.vlawmo.org

Email: office@vlawmo.org

Phone: (651) 204-6070

Fax: (651) 204-6173

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Letter from the Administrator

Greetings!

2017 was the kick off for our new 10-year Water Management Plan. Our Board and Technical Commission, partners, and a host of stakeholders have guided our projects and programs and it's time for action. They came up with a busy year.

Two capital projects were installed in the fall. We're especially excited about the Whitaker treatment wetlands in White Bear Township (details on page 9). Another success story was restoring a degraded section of Sucker channel just south of Hwy. 96. With the help of Ramsey County Parks and Recreation, Ramsey Conservation District, the Saint Paul Regional Water Services, and State of Minnesota grant money (also found on page 9). Both projects serve to improve water quality and add deep-rooted native plantings to the watershed. We hope you take a look at these projects at Columbia Park and Vadnais/Sucker Lake Park this summer!

Lambert Creek is an important focus for our watershed. The Board directed much of its energy to understanding its responsibility as the ditch authority for Lambert Creek (Co. Ditch 14) and Dillan ditch (Co. Ditch 13). Working sessions with legal staff and Vadnais Heights led to winter ditch cleaning and more maintenance efforts in spring, 2018. VLAWMO hired Houston Engineering to survey all of Lambert Creek, complete modeling, and update historical records for the state database. This work will continue in 2018 but the groundwork was laid in 2017. We look forward to the improvement projects that will come from Houston's report.

Nick Voss, the Education & Outreach Coordinator has been working hard in multiple areas. Regular Facebook posts, a website blog, news articles, volunteer events, an adopt-a-drain program, and an expanded video library continue to carry our message to the community.

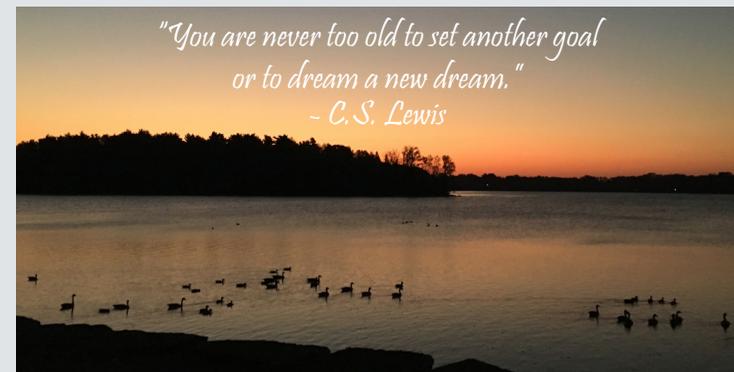
Kristine Jenson has worked to keep our cost-share programs popular as we partner with homeowners and businesses around the watershed. The Raingarden and native plant workshops were held in the spring. Our Landscape Level 1 grant program ran out of funding by May.

Water quality monitoring continued on 12 lakes as well as Lambert creek. In 2017 the bacteria molecular monitoring program completed its fourth and final year on Lambert Creek. A full report will be available to local partners and state agencies in 2018. This innovative project addressing the source and transport of bacteria in urban stormwater has generated interest among professionals in the Twin Cities Metro. We're excited to be able to share our results.

Other water monitoring highlights include our work with Wilkinson and Goose Lakes, both high nutrient impaired water bodies prioritized for improvements. A planning session was held in early 2017 to lay out the options, needs, and interests from stakeholders. To understand each lake's needs VLAWMO staff, sometimes in concert with consultants conducted a variety of storm sample, sediment core and water column tests. Monitoring reports with a wealth of information are posted on the VLAWMO website under the "resources" tab (browse by checking categories and studies).

2018 shows great promise as well. Grant funding was awarded to address a Birch Lake runoff problem area. Look for reports on Goose Lake, Lambert Creek, Charley, and Deep Lakes, and first year results from Whitaker wetlands. Thank you for supporting our mission of watershed protection and enhancement!

- Stephanie McNamara, VLAWMO Administrator



Early Morning on Vadnais Lake

Background

The Vadnais Lake Area Water Management Organization (VLAWMO) was formed in 1983 to protect the Vadnais Lake watershed area in northern Ramsey County and a small portion of Anoka County. Our organization was formed through a Joint Powers Agreement (JPA) that was ratified by the 6 cities within VLAWMO boundaries to comply with the State of Minnesota Metropolitan Surface Water Management Act (Minnesota statute Chapters 103A – 103H). We are governed by a 6 member Board of Directors that is represented by an elected official from each of the communities. VLAWMO covers approximately 25 square miles and includes portions of Vadnais Heights, White Bear Township, White Bear Lake, Gem Lake, Lino Lakes, and all of North Oaks.

OUR APPROACH

Managing a watershed area to protect our vital water resources has become the primary approach across the country. Since water flows across political boundaries, partnerships among local governments, regional, state and federal agencies are vital. Because Vadnais Lake is used as the drinking water reservoir for approximately 400,000 customers in the St. Paul area, VLAWMO frequently partners with the St. Paul Regional Water Service (SPRWS) on a variety of water quality monitoring and improvement projects.

OUR CORE PRINCIPLES

To guide our efforts towards achieving our mission, VLAWMO shares responsibility with its member communities to:

- » Protect surface water quality
- » Protect groundwater quality and recharge areas
- » Provide public education to promote good stewardship of water resources
- » Protect and manage wetlands through the Wetland Conservation Act
- » Collaborate with other public and private organizations
- » Manage stormwater and control flooding through the use of best management practices
- » Require good erosion control practices, both during development and as a part of good stewardship

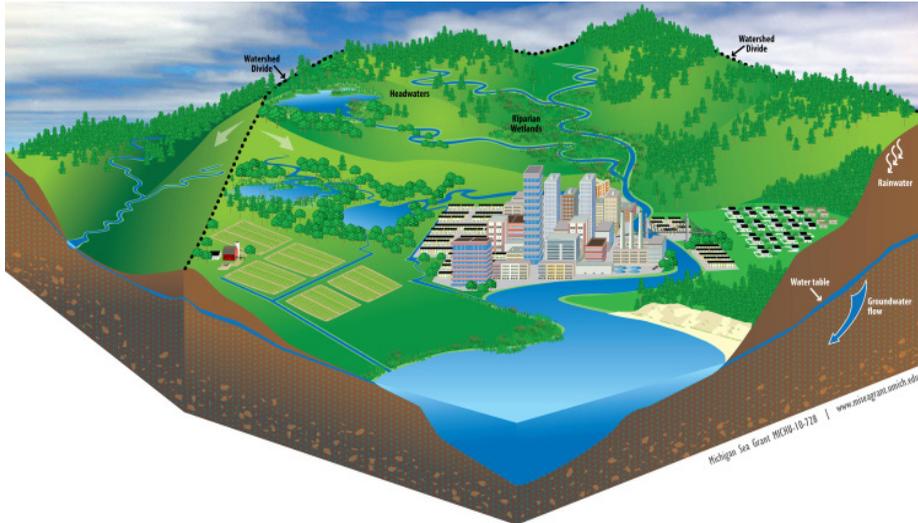


Vadnais Lake pumping house, early 1900s - courtesy of MN Historical Society

Mission Statement

Our mission at the Vadnais Lake Area Water Management Organization is to protect and enhance the water resources within the watershed.

Activities we work on include: water quality monitoring, education and outreach projects, wetland protection, and water quality enhancement projects.



"How Watersheds Work" courtesy of Michigan Sea Grant (MICHU-10-728)



What is a Watershed?

A watershed is all the land area that drains to a specific water resource, such as a lake or stream. Watersheds range in size from a few square miles to an entire continent. As rain and melting snow run downhill, they carry sediment and other materials into streams, lakes, and groundwater.

The land use activities within a watershed have a direct impact on the quality of the water. 96% of the land use within VLAWMO is urban with a small area of agricultural land in the northern end.

Watersheds provide water for drinking, irrigation, streams, and activities such as fishing, swimming, and boating. In addition, watersheds also provide food and shelter for wildlife.

OUR GOALS

Accomplishing our mission requires a focus on common goals. The VLAWMO will pursue the following goals as a way of proceeding towards the mission.

- » Protect and improve surface water quality
- » Protect and enhance wetland resources
- » Protect and improve waters for wildlife habitat and recreation
- » Enhance public participation and stewardship
- » Make and enable informed decisions
- » Optimize public resources
- » Protect and improve groundwater quality and quantity
- » Analyze and use alternative funding sources
- » Improve communications
- » Prevent flooding

WHAT IS A WMO?

A watershed management organization (WMO) is a local government agency charged with protecting water resources within its boundaries. All land within the metropolitan area must be within an organized watershed (State Statutes Chapters 103B & 103D). Watershed Districts are governed by County Commissioners while Water Management Organizations are governed on the municipal level.

WHO PAYS FOR IT?

The Vadnais Lake Area Water Management Organization is funded by a stormwater utility fee. Property owners within the watershed are charged a fee to manage the stormwater that runs off their property. This public utility fee is determined by land use (eg residential, commercial etc), and is included on Ramsey County property tax statements. The authority to charge and collect a stormwater utility fee is governed by Minnesota State Law.

Water Resources in the Watershed

LAKES

There are 16 lakes within VLAWMO. East Goose Lake, West Goose Lake and Birch Lake are located in White Bear Lake. Tamarack Lake, Fish Lake and Ox Lake are located in White Bear Township. Gem Lake is located in Gem Lake. Amelia Lake is located in Lino Lakes. Pleasant Lake, Charley Lake, Deep Lake, Black Lake, Wilkinson Lake and Gilfillan Lake are located in North Oaks. Sucker Lake, East and West Vadnais Lake are located in Vadnais Heights.

East Vadnais Lake is the drinking water reservoir for the City of Saint Paul. East Vadnais Lake is supplied with water pumped from the Mississippi River in Fridley that flows via underground aqueduct into Lake Charley in North Oaks. The water then flows east to Pleasant Lake, then south into Sucker Lake, and then into East Vadnais.

LAMBERT CREEK

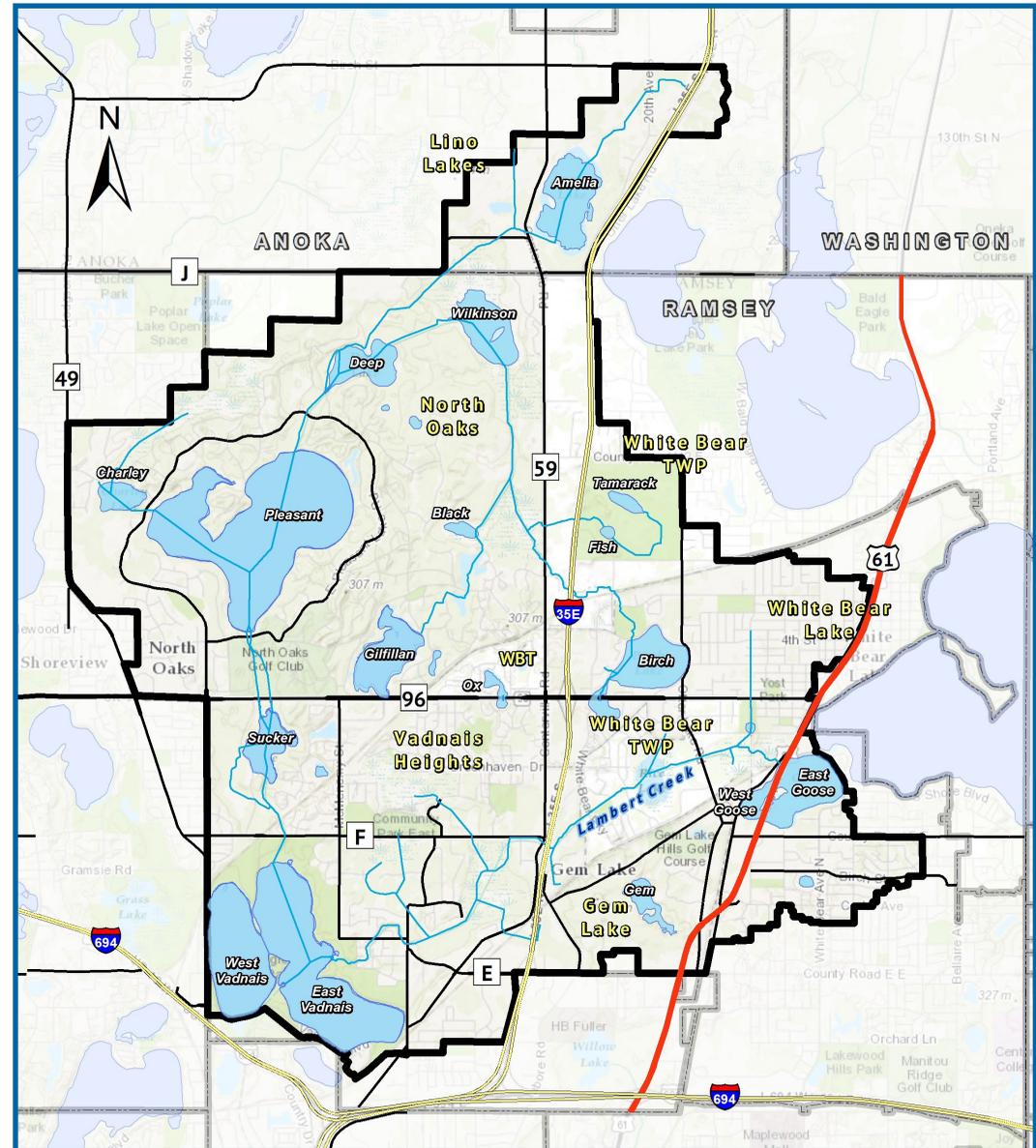
VLAWMO has jurisdiction over Lambert Creek, 4.5 miles of creek and wetland that runs from West Goose Lake and eventually empties into East Vadnais Lake.

WETLANDS

There are over 500 wetlands within VLAWMO. Tamarack, Grass, Wilkinson, Rice, Lambert, and Sobota Slough are a few of the largest tracts of wetlands in the watershed.

GROUNDWATER

Groundwater beneath the land surface of the Watershed flows to local lakes, the Mississippi River, and aquifers including the Prairie du Chien aquifer.



THE YEAR IN REVIEW:
2016 activities, projects, and improvements

IN THIS SECTION

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- » Water Monitoring
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Research

FISH SURVEYS

In support of VLAWMO's 2017-2026 water plan, fish surveys are conducted every few years to keep close tabs on what's happening in our lakes. Fish surveys are a useful tool in lake management because it tells us about nutrients, sediment, and vegetation in addition to the actual fish population. Comparing vegetation studies, fish studies, and water monitoring data forms a deeper understanding and gets us closer to the true status of the lake.

The last time a fish survey was conducted at Goose Lake was 2012. At that time, bullheads were abundant in the lake, indicating a high amount of sediment stirring into the water column. This is because bullhead, like carp, are "rough fish" that routinely stir up the lake bottom with their feeding habits. The result is released nutrients such as phosphorus that promotes algae growth.

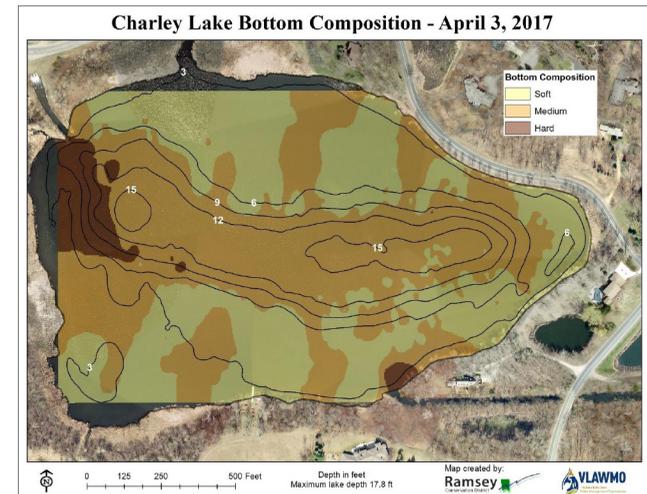
This year, 206 fish were netted, recorded, and set free. This is down from the 2012 survey, that included 312 fish, but we also see an improvement in the rough fish population. Bullhead have been decreased from 80 to 22, and black crappie has increased from 33 to 150. This tells us that the crappie population is established enough to control the bullhead population

through predation of their eggs. While Goose Lake is still impaired for high nutrients, we can assume that the lake is heading in the right direction. See the full report on the VLAWMO website.



BATHYMETRY & VEGETATION STUDIES

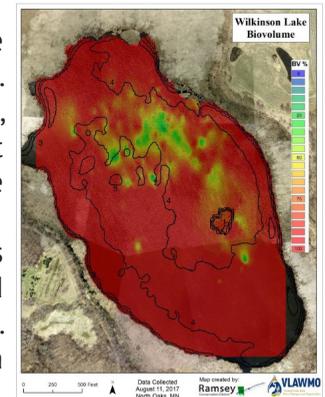
Bathymetry and vegetation studies are a doctor's check-up for a lake. If a shallow lake is rich in vegetation, this implies a healthy lake that holds its nutrients in plants instead of in the water column through algae. However the diversity of the plant life, the amount, and the shape of the lake bottom are also important. With these we can draw conclusions in things like the lake's wintering ability and limits in holding nutrients. With this we can set realistic goals for lake improvement.



As seen above, Charley Lake Bathymetry studies showed us how water moves through the lake and creates a deep channel.

At right, we see how Wilkinson Lake is heavily vegetated throughout. Using both of these studies, VLAWMO determines if the amount of vegetation is adequate for lake depth and water quality.

Like a check-up, these reports are useful for future decisions and are a record of the lake's health. As an impaired lake, Wilkinson is a higher priority for improvements.



Large Projects

WHITAKER TREATMENT WETLANDS

Grant Funds: MN Legislative-Citizen Commission on Minnesota Resources (LCCMR)

Location: White Bear Township

Completion: Spring, 2018

Cost: \$500,000



The Whitaker Treatment Wetlands are an innovative research project that also serves as a filter for Lambert Creek. VLAWMO is excited to partner with the University of Minnesota, White Bear Township, and Barr Engineering for this project. VLAWMO is thankful to receive a grant from LCCMR for this project.

The structure of three treatment 'wetlands' are fed water from stormwater runoff. This runoff is the start of Lambert Creek, which flows in to Vadnais Lake, and is impaired for E. coli bacteria and is high in nutrients. The polluted stormwater is pumped through the three wetland cells that consist of different engineered soils called *sorptive material*. The water is monitored and directed back into Lambert Creek.

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Water monitoring will help us understand which soil mixture is most effective at treating stormwater runoff and removing bacteria. Findings for this project could have major implications for stormwater treatment across the country. The design was done by Burns and McDonnell Engineering.



Three wetland cells are filled with sorptive material and ready for Spring planting.

SUCKER CHANNEL RESTORATION

Capital Improvement Project

Location: Vadnais Heights

Completion: May, 2018

Amount Awarded: \$20,000

The Sucker Channel restoration is a collaboration between Ramsey County Parks, Ramsey Conservation District (RCD), VLAWMO, and the Saint Paul Regional Water Services (SPRWS). This popular park and fishing destination was experiencing heavy erosion between Pleasant Lake and Sucker Lake, harming water quality in Sucker Lake and creating inefficiencies in the water filtration process. To improve aquatic habitat and protect this source of drinking water, the shoreline was stabilized with rip-rap, coir logs, and new vegetative cover. Enhanced handicap accessibility, fishing nodes, a platform along the culvert at highway 96, and native plantings improve the park for guests, wildlife, and water.



Above: The channel pre-construction had turf grass directly down to the water line. Grass clippings, eroded soil, goose droppings, and crumbled concrete from the 90's were washing into the channel, bringing nutrients and contaminants into the water.



Above: The new channel is nearly complete in late fall, awaiting planting in Spring, 2018.

In the Community

COMMUNITY EVENTS

Staffing a booth at popular local events is a fun and valuable way to connect with community members. At events VLAWMO has the opportunity to share its work, provide brochures, give away prizes such as rainbarrels or tote bags, and answer questions for event goers. This year, community events served a dual purpose by also providing a place to conduct community surveys for the Education and Outreach Plan (p. 11).

VLAWMO booths were presented at the following 2017 events:

- » Vadnais Heights Community Business Expo - April
- » Saint Paul Regional Water Service Open House - May
- » 2017 White Bear Lake Water Symposium - June
- » North Oaks Community Fair - June
- » WBL Marketfest: Conservation and Environment Day - July
- » Taste of Vadnais - July
- » Vadnais Heights Farmers Market - August



Vadnais Heights Community Business Expo



Marketfest



Taste of Vadnais - hiding out from the rain

Education Programs

MACROINVERTEBRATES FIELD DAY

Macroinvertebrate (“water bug”) workshops are a way for students to interact with our local water resources and glimpse a day in the life of an ecologist. Field trips from AFSA high school, Vadnais Heights summer programs, White Bear Lake Area Schools summer programs, and the general public visited the Vadnais/Sucker Lakes park for the activity.

After a brief explanation of the activity, students spend time netting in the Sucker Lake channel to try to gather interesting specimens that can lead to clues about the water quality in the channel. Upon a successful netting, students sort the macroinvertebrates in an ice cube tray and ID them using charts. Certain species prefer clean water, and certain species are able to live in murky, algae rich, or polluted water. At the end of the day, students make an educated conclusion about the water.



WORKSHOPS

VLAWMO continues to offer its classic raingarden workshop each Spring. Participants in the raingarden workshop learned about the watershed, stormwater runoff, how to build and maintain a raingarden, and got a head start with tools such as the Blue Thumb Guide to Raingardens and VLAWMO’s web-based geographic information systems (GIS) map.

2017 was also the first year for a new workshop in native plants. Participants ranged from previous raingarden cost-share recipients as well as plant and garden enthusiasts. This workshop dug deep into plant identification, planting plans and strategies, and how native vegetation is a valuable asset for the watershed.

RAINGARDEN WORKSHOP - 14 PARTICIPANTS
NATIVE PLANTS WORKSHOP - 30 PARTICIPANTS



Left: Shoreline Restoration on Birch Lake
Shoreline Restoration on a stormpond in Vadnais Heights

Cost Share Programs

VLAWMO's Cost Share Program exists to provide assistance to public and private landowners for implementing programs and projects that support one or more of the following:

- » Prevention of flooding or mitigation of drought
- » Water quality improvement or increase in watershed storage capacity
- » Preservation, protection, and restoration of native plant and wildlife communities, especially along lakes, streams, and wetlands
- » Protection and preservation of groundwater quality and quantity

Available funds vary by year. Once the annual amount is depleted, applicants are advised to reapply the following year.

There are 3 cost share programs:

- » Rainbarrel
- » Landscape Level 1
- » Landscape Level 2



LANDSCAPE COST SHARE PROGRAMS

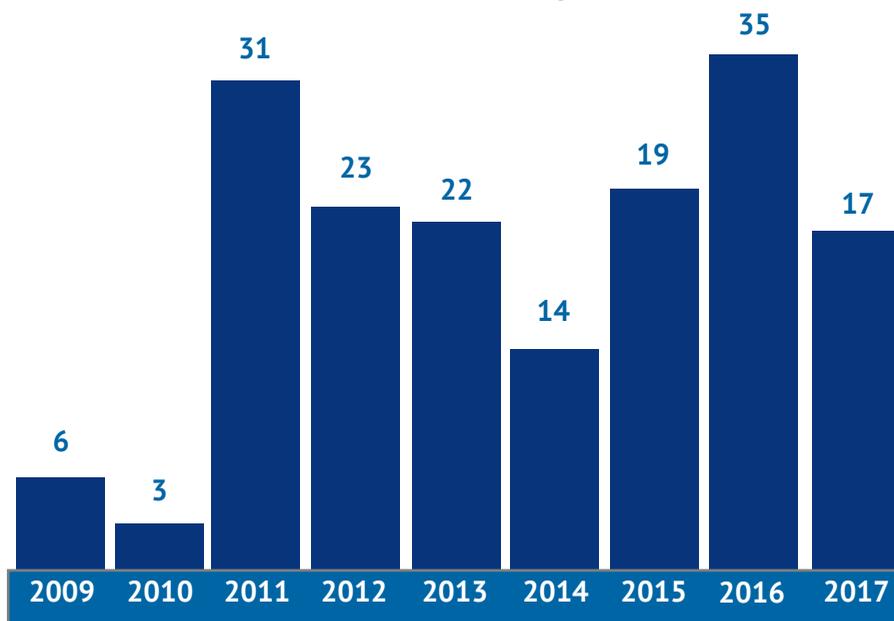
Landscape Level 1: Reimburses property owners 75% of the costs associated with implementing approved water quality improvement projects. The maximum reimbursement is \$2,000 for this program. Typical projects include raingardens, shoreline restoration, native habitat restoration, or pervious paver installation.

Landscape Level 2: Projects with a larger total cost (minimum total cost of \$5,000) and will reimburse 75% of the costs, up to \$20,000. The program was updated in 2015 to allow funding to be more available for applicants.

VLAWMO uses the Minimal Impact Design Standards (MIDS) to measure the impact of landscape improvement projects. The impact of 2017's projects are estimated to improve water quality by:

- Reducing phosphorus by **5.43 lbs** per year.
- Reducing suspended solids by **987 lbs** per year.
- Infiltrating **2,173,524 gallons** of water into groundwater annually.

Total Annual Grants: Landscape & Rainbarrel



Shoreline Restoration on Birch Lake

LANDSCAPE LEVEL 1 SUMMARY

For Landscape level one, **13** grants were awarded funding for a total of \$18,450. This was the largest year for landscape level 1 grants in the program's history. Because of this, level one cost-share funds were depleted halfway through 2017.

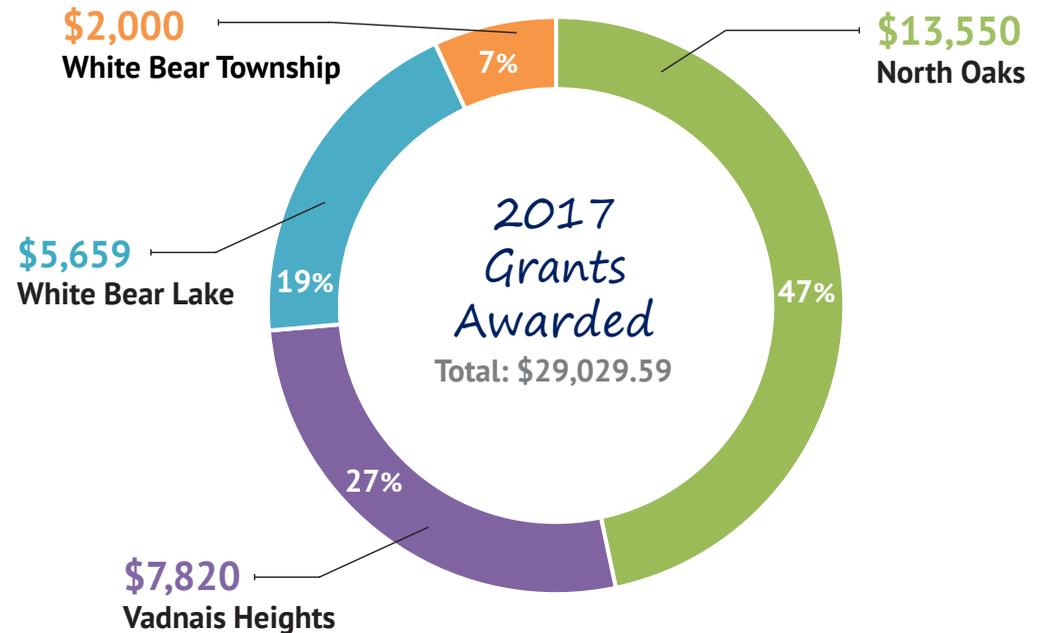


Of the 13 level one grants, four were native plant restorations totaling 20,500 ft². Four were raingardens totaling 3,380 ft². One was a pervious pavement installation totaling 165 ft².



LANDSCAPE LEVEL 2 SUMMARY

1 Landscape level two grant was awarded for a total of \$10,000. This project was an aeration improvement at the Pines of North Oaks. Installed sensors or "smart controllers" complete with software allow the new system to adjust lawn watering according to the weather, providing greater efficiency and water savings - now that's smart watering!



RAINBARREL COST SHARE PROGRAM

The Rainbarrel Program reimburses residents 50% of the cost towards the purchase of up to 2 rainbarrels. Applicants are limited to \$125 maximum reimbursement per rainbarrel. In promotion of the program

RAINBARREL SUMMARY

In 2017 VLAWMO awarded grants for **3** rainbarrels, for a total of \$154.59. A total of 83 rainbarrel grants have been awarded since the program began in 2007. Each time the barrels are filled, up to 4,400 gallons of water is available for reuse. If each rainbarrel gets filled 10 times throughout the year, that's 44,000 gallons! An additional 4 rainbarrels were awarded as prizes during 2016 public events (pictured left).

COMMUNITY BLUE GRANT PROGRAM

Community Blue is an education focused grant program for community groups within VLAWMO. It funds educational events and resources as they relate to water resources, and provides support in making existing stormwater, wetland, or watershed improvements into educational tools with public exposure. 1 Community Blue grant was completed in 2017 for the amount of \$700 (page 14).

Community Blue WHITE BEAR WATER SYMPOSIUM

In 2017 the Community Blue program funded an actor-educator presentation at the first annual White Bear Water Symposium. White Bear School District, being the recipients of the grant, contracted Climb Theater to provide the presentation on how to be a “water hero”. The presentation covered local and global water issues, in a way that was easy for kids to grasp and apply to their lives.

The presentation was a part of a larger effort to bring students, families, and the public together with a focus on local water resources. Students presented educational videos and “enviro-scapes”, which are mini watershed models that demonstrate the concept of stormwater runoff. The event also featured booths from different watershed districts, presentations from the experts, poly-bots (a mixture of robotics, water, and seed growing), as well as lunch.



If your community has an idea on how to harness education, demonstrations, the arts, or instruction in a way that relates to water

stewardship, contact us to explore the possibilities of a Community Blue grant application.



Stakeholder Meetings 25 X 25 TOWNHALL



The 25 x 25 town hall was a state-wide initiative from Governor Dayton. The goal is to improve Minnesota’s water quality by 25% by year 2025. To coordinate a local edition, VLAWMO partnered with Rice Creek Watershed District, Conservation Minnesota, and the City of White Bear Lake.

Each organization presented on their work, challenges, and future aspirations. Input was gathered in the form of public comments to be used for the state water quality improvement plan.

GOOSE LAKE & WILKINSON LAKE CHARETTE

Goose and Wilkinson lakes are water bodies that need water quality improvements, but also have multiple priorities and uses. Planning in these situations is nearly impossible, unless all parties are present and part of the plan. A Goose and Wilkinson planning charette took place in January, 2017.

Stakeholders include the North Oaks Corporation, MNDOT, The White Bear Ski Otters, the MN Pollution Control Agency, the City of White Bear Lake, the City of North Oaks, and Ramsey Conservation District. This work continues in 2018.



Outreach

ADOPT-A-DRAIN

The adopt-a-drain program is a convenient and practical way to make a positive impact on a nearby water body. Residents, community groups, or businesses commit to checking their stormdrain 3 times/month, with a rate of cleaning that is up to the volunteer. Upon registration, an info-packet is sent to volunteers containing instructions and background information on why stormwater is an important issue. Data is kept throughout the year and compiled in December to document the pounds of sand, grass clippings, leaves, and other debris that is spared from lakes and wetlands.

Each volunteer makes a major difference in this effort, raising awareness in their community and directly reducing algae-producing nutrients and sediments that clog up our lakes and wetlands. Visit our website at vlawmo.org/get-involved to learn more and sign-up to join the team!



RAINBARREL WINNERS

The tradition continues at VLAWMO's Spring and Summer events. Fair goes at MarketFest, Taste of Vadnais, the North Oaks Community Fair, and Vadnais Heights Farmer's Market had the opportunity to enter to win a free rainbarrel upon signing up to our seasonal email list. 5 rainbarrels were given away, allowing VLAWMO's audience to grow while capturing and re-using stormwater runoff at the same time. Our emails contain no spam - we promise!



PHENOLOGY IN NORTH OAKS

In July, 2017, VLAWMO teamed up with the North Oaks Home Owner's Association and the U of M's Backyard Phenology program to offer phenology training. Homeowners learned about how to observe seasonal changes in their yards, parks, and trails. Residents also learned how to participate in a picture post project between Deep and Pleasant Lakes.

This post allows volunteers to easily and consistently and regularly photograph the shoreline and nearby wetland. Photos are uploaded to the Picture Post website and will be a valuable tool for home owners, North Oaks, the Saint Paul Regional Water Service, and VLAWMO to better understand the subtle trends and changes that occur on the shoreline and in the water. Examples include tracking ice-out, algae blooms, erosion, and more .



MEDIA

Water resource topics can be complicated because there's always multiple interests involved. Videos are a helpful way to convey our message in an effective way that's also accessible to the public.



Blog found at
VLAWMO.org

Follow our social media
with the handle:
"@VLAWMO"

Videos produced in 2017 include:

- Tour the Watershed presentation
- Lambert Creek: Past & present
- Winter maintenance for clean water: parts 1 & 2

YouTube





Volunteer Activities



Volunteers bring VLAWMO's work into the community. Volunteers help with water sampling, booth staffing, community outreach, advising VLAWMO on public interest and priorities, and leading by example.

CITIZEN LAKE MONITORING PROGRAM (CLMP)

VLAWMO would like to thank the following volunteers for their role in the Citizen Lake Monitoring Program, collecting water samples bi-weekly from May through September. The volunteers for 2017 were: Jim Grisim (Birch Lake), Justine Rowe (East Vadnais Lake) and Shannon Stewart (Tamarack Lake).

WATERSHED ACTION VOLUNTEERS (WAV)

VLAWMO is grateful for the volunteers who have supported the Watershed Action Volunteers in 2017: Alina/Vadnais Heights Clinic nurses, St. Mary's of the Lake youth group, Erik Barsness, Bob Larsen, Diane Gorder, Grace Watkins, Micah Watkins, Connie Winterhalter, and Gina Schmidt.

2017 volunteer activities included:

- » Staffing VLAWMO booths at community events: MarketFest, Taste of Vadnais (pictured left).
- » Stormdrain stenciling and cleaning while promoting adopt-a-drain
- » Raingarden maintenance
- » Creating educational videos for decreasing home salt use
- » Advising VLAWMO on public interest, priorities, and opportunities



Water Monitoring

INTRODUCTION

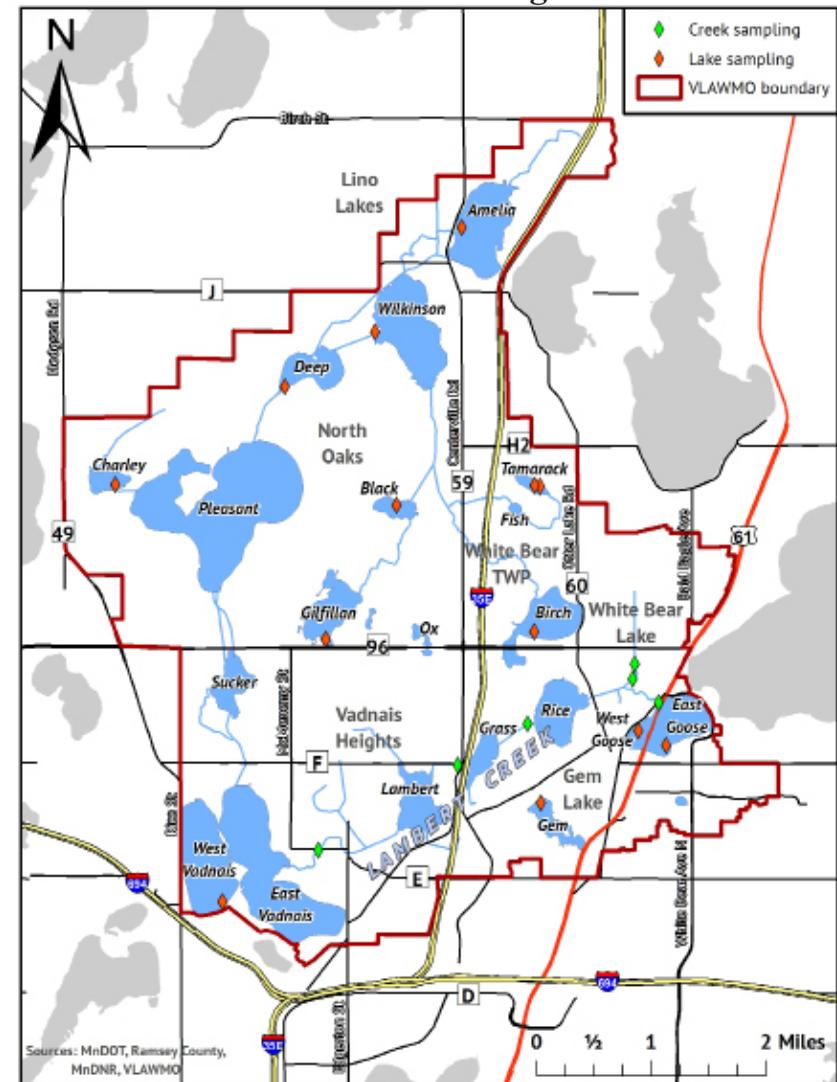
VLAWMO's regular water quality monitoring program includes nutrient sampling on 6 Lambert Creek sites, and nutrient sampling on 12 of the Vadnais Lake Area Watershed lakes. Nutrients and pollutants sampled for data include: total phosphorus, chlorophyll-A, soluble-reactive phosphorus, iron, total nitrogen, nitrate, total suspended solids, and chloride. VLAWMO's specialty monitoring programs, such as E coli and winter chloride sampling, will continue. See the 2016 Annual Report Summary for a map of monitoring locations.

2016 was officially the wettest year on record in Minnesota. Part of VLAWMO's water monitoring includes rainfall measurements because rainfall and the timing of rainfall are factors that influence water quality. Typically, more precipitation implies more water runoff, which carries more contaminants from the land surface into water bodies.

Lakes are summarized with a grading system called the Trophic State Index (TSI). This system was developed in the 1970's to calculate average phosphorus, chlorophyll-A, and Secchi disk readings, and generate a summarizing number. Letter grades are developed from the Metropolitan Council matrix for annual averages.



VLAWMO Monitoring Locations

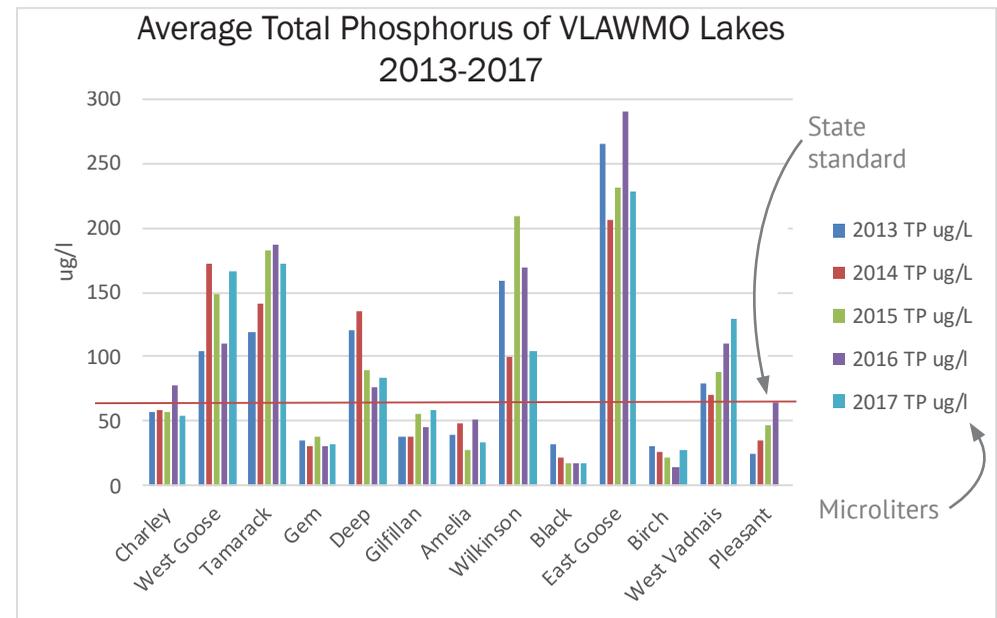


Monitoring results are used to guide local water policies and management, and to help prioritize and locate future water quality projects such as raingardens, underground retention basins, and shoreline restorations. The full 2016 monitoring report is available at: vlawmo.org/resources

WATER MONITORING SUMMARY

- » **Gem Lake:** Gem Lake's chemistry has improved over the last 5 years which coincides with the work that was done on Highway 61 and the reconstructed grass swales flowing into the lake. Water quality parameters are below state standards. The MNPCA is currently looking into delisting Gem Lake from the impaired list.
- » **Lake Gilfillan:** Gilfillan is also on the State Impaired List. Since the augmentation system went in (2012) to raise the water level, the water quality has improved (most likely due to dilution). We have been told that no augmentation has occurred the last five years so it has been maintaining its water level on its own. Nutrient levels look to be slightly rising over the last five years near state standards.
- » **East Goose & West Goose:** Booth Goose Lakes are still very high nutrient levels. Bullhead removal did not make the water quality impact we hoped, but it did reduce nutrient levels a little, and a 2017 fish survey indicated the bullhead population is still under control. Sediment cores and enhanced sampling were completed in 2017 for possible future alum treatment.
- » **Wilkinson:** Wilkinson's phosphorus is well over state standards but Chlorophyll A is well below standard. Wilkinson acts more like a wetland and therefore what goes on in the watershed has a greater effect on the chemistry. A special study was done on the wetland complex connecting Amelia to Wilkinson and results indicate nutrient loading from that system
- » **Tamarack Lake:** Data for nutrient levels are still high. The floating wetland has not shown any effect as of yet. This is the fifth full year of monitoring the island. Samples were taken right next to the island and compared it to samples taken off the dock. There is no difference between the two spots. So far the water chemistry is similar to what was seen in the past. Monitoring will continue. The floating island currently provides good habitat and educational opportunities and will hopefully help improve water quality over the next few years.
- » **Automated sampler:** This was installed at 4th and Otter Lake Rd. This area drains stormwater into Birch Lake. Results showed very high nutrient levels during storms.
- » **Chloride Levels:** Overall were similar to last year. We have been sampling for 8 years and there have been no significant changes within the lakes. Black Lake has the lowest levels. Birch Lake and East Goose are the highest which makes sense due to the proximity to major roads. All of the lakes are below the current State standards. The creek samples are difficult to catch because it has to be done when water is flowing. Year round chloride sampling on Birch Lake was done for the second year and levels have stayed steady
- » **Wet weather E. coli study:** showed that the flow from storm events in the creek has a correlation to the amount of E. coli in the samples. Stormwater runoff seems to be the source of high E. coli levels in the Whitaker and Goose sub-watersheds, mainly from the runoff carrying high levels of E. coli off of terrestrial soils and road gutters.

The complete 2017 Monitoring Report and a summary can be found at VLAWMO.org/resources/reports



MONITORING SUMMARY - CONTINUED

E. COLI BACTERIA SOURCING PROJECT

Lambert Creek is currently on the State Impaired Waters 303(d) list for high levels of *E. coli* bacteria. The creek was monitored for *E. coli* at 5 sub-watershed sampling locations weekly during the summer from 2008-2012. VLAWMO has been working with a consultant to perform target monitoring and molecular sourcing to discover the source of the *E. coli* impairment (whether the bacteria comes from human, animal or avian sources). The recently approved Total Maximum Daily Load study (TMDL) suggests a 37%-61% reduction in current bacteria loads to the creek.

At the completion of this project we hope to have an understanding of exactly where the *E. coli* is coming from at these locations on the creek and also determine proper best management practices (BMP's) to reduce the amount of bacteria in the creek. 2014 source monitoring focused on the County Road F and Oakmede sites, while 2015 sampling targeted the Whitaker and Goose drainage sites. The 2016 focus was on wet weather sourcing at County Road F and Oakmede sites. The 2017 focus was on wet weather sourcing at Whitaker and Goose sites.

THE E. COLI SOURCING PROCESS

VLAWMO is working with a consultant to perform target monitoring to clarify geographic source of *E. coli*. Further, DNA analysis is uncovering the host animal source of the *E. coli* impairment (whether the bacteria comes from human, avian, canine, or other animal sources. 3 rain events were targeted for sampling, each containing hundreds of samples taken right before and during rain events.

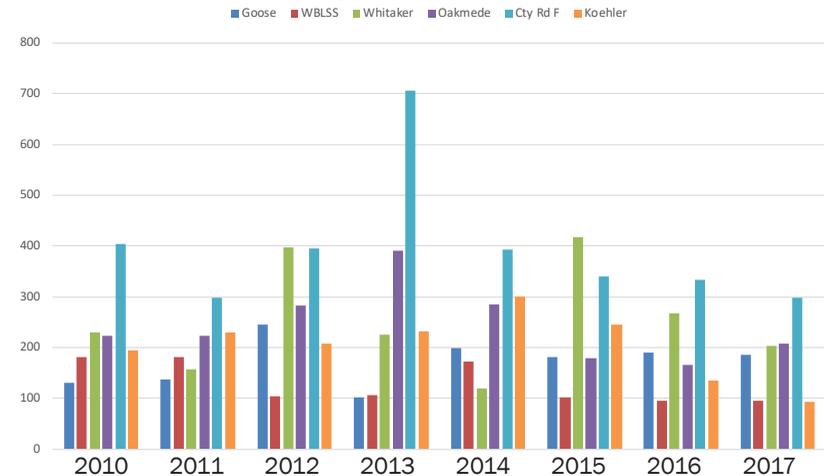
E.COLI SOURCING RESULTS AND REPORT

In 2016, VLAWMO completed the County Road F and Oakmede sub-drainages this summer for wet conditions. *E. coli* concentrations were monitored at primary sites as well as tested for the human, canine, and avian genetic markers along with sediment studies in the sub-drainages.

The results from County Road F and Oakmede wet weather *E. coli* concentrations showed above state chronic standard levels of *E. coli* (more than 126cfu/100ml), indicating the impairment is wet weather related at these sites. Both sites were also negative for the human genetic marker suggesting there are no septic or sanitary sewer leaks contaminating ground water in these areas leeching into the creek. Both sites were positive for the avian and canine markers, suggesting that waterfowl and dog waste have an influence on the bacteria levels in the creek.

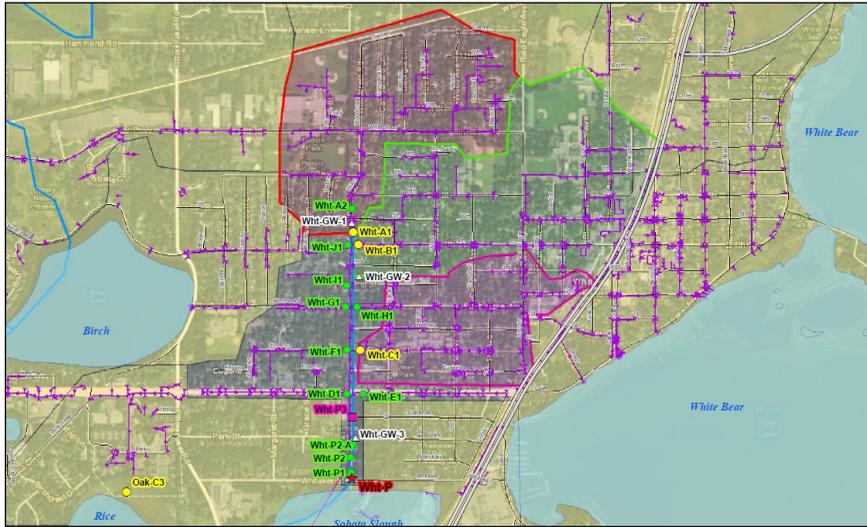
The four year *E. coli* sourcing project final report will be available in Summer, 2018.

Lambert Creek Historical Total Phosphorus
(ug/l) 2009-2017



The above map displays Goose Lake sampling locations. Stormwater runoff was monitored during rain events to assess sources of contaminants and nutrients flowing into the lake.

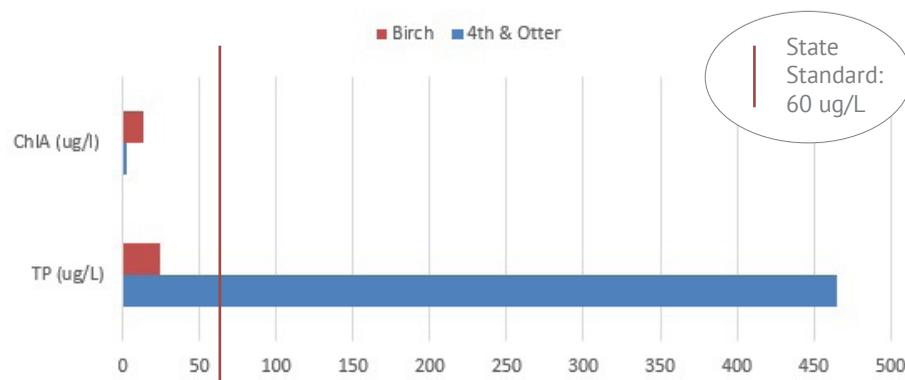
MONITORING SUMMARY - CONTINUED



The above map displays sampling location that drain into Whitaker Pond and Lambert Creek.

Automated sampler: VLAWMO’s automated sampler is used to take stormwater samples from rainstorm events to measure increases in nutrient loading that are introduced to our water bodies. The sampler is used in areas where stormwater-induced nutrient loading is suspected to be an issue. The graph below illustrates the nutrient load to Birch Lake.

Chlorophyll and Phosphorus measurements of 4th St & Otter v. Birch Lake: Average of 4 Samples



Review of 2017 Work Plan

2017 was the first year of action for the 2017-2026 comprehensive water plan. It was adopted by the Board in October, 2016 and hit the ground running ever since. The new Education and Outreach Plan and the VLAWMO water policy update were also adopted at the same time. Stakeholder input went into all three planning and policy documents, which will continue to guide VLAWMO’s work for years to come (see page 8). Another major project was the Sucker Channel restoration, which required partnerships with Ramsey County Parks and the Saint Paul Regional Water Services (page 9).

It was a big year for innovation. The long-awaited Whitaker Treatment Wetlands system was installed in the Fall, supported by a grant from the Legislative-Citizen Commission on Minnesota Resources (LCCMR). The results of this study and stormwater treatment method may bring insights in stormwater management across the country. We’re thankful for White Bear Township’s support in this project!

For the first time, our cost-share program depleted its funding before the year’s half-way mark, due to heavy demand in the landscape level 1 program. The Community Blue Grant Program kept active with an educational grant for the public in White Bear Lake. The monitoring program continued lake and stream monitoring, compiling data for VLAWMO’s annual monitoring report (available on vlawmo.org).



Acronyms:

BOD: Board of Directors

BMP: Best Management Practice (pertaining to stormwater treatment)

RFP: Request for Proposal

TEC: Technical Commission

Review of 2017 Work Plan

CAPITAL IMPROVEMENT PROJECTS - 2017

Project Name	Description	Goal: Going into 2017	Goal: 2017 Result
Sucker Lake Channel Restoration	This project is a joint effort in partnership with Ramsey County Parks, Ramsey Conservation District, and the St. Paul Regional Water Service. When completed it will restore approximately 700 linear feet of shoreline that has eroded. Includes fishing access locations to support the current use of the site.	Finalize designs, secure partner agreements, go out for bid Summer, 2017.	Agreements secured, designs finalized, bid complete. Installation complete except for planting, to be finished Spring, 2018.
Whitaker Treatment Wetlands	A stormwater treatment project partnering with the U of MN with funding through LCCMR grant funding. Stormwater from Whitaker Pond is routed to wetland treatment cells then infiltrated into shallow groundwater. The study will determine which of three sorption materials is most effective at filtering pollutants, contaminants, and bacteria.	Finalize design and cost estimates. Release project for bid. Start installation and preliminary sample collection.	Bid complete, design finalized, installation complete except planting and preliminary sample collection, to be completed Spring, 2018.
Lambert Creek: Lower Kohler channel restoration	This project will restore approximately 200 ft. of streambank downstream of the Kohler flume. Engineered armoring will be part of first section below the flume. Native vegetation will be planted to help stabilize the banks. Partner with City of Vadnais Heights on downstream restoration.	Installation complete by Spring of 2017.	Project complete
Goose & Wilkinson Lakes: Load assessment for project development	VLAWMO will work with consultants to assess all data and information collected on these water bodies, engage with stakeholders (see page 14), and determine the next best steps for nutrient reduction.	Determine next steps to reduce nutrient levels. Begin development plans for 2018 installations. Assist MS4's in achieving their WLA's.	Next steps pending
Birch Lake: 4th and Otter Road Project Development	VLAWMO to work with a consultant to assess the options for BMPs at the 4th and Otter Lake Rd site. Conceptual designs of best possible projects will be completed and VLAWMO will work with its partners to finalize design and secure funding.	Capture stormwater from residential area and reduce incoming nutrients. Secure funding.	Funding secured through BWSR (Board of Water and Soil Resources) grant.

GRANT PROGRAMS

CORE ACTIVITY #	Project Name	Description	Goal: Going into 2017	Goal: 2017 Result	
	3.4	Landscape Level 1	Establish relationships and provide grants to property owners within the watershed to install water quality enhancement projects.	Install at least 10 projects Achieve .25 lbs of phosphorus/year removed from local waters.	Complete
	3.4	Landscape Level 2	Landscape Level 2 Cost Share Program is aimed at assisting landowners with implementing larger BMP projects within the watershed. Preference for projects that have high visibility, educational value and/or local citizen support.	Install at least 1 project. Achieve .25 lbs of phosphorus/year removed from local waters.	Complete
	3.3	Community Blue	A communication and outreach grant program to provide money for projects big and small that otherwise might not qualify for other grant awards. Projects must provide education and outreach benefits that directly relate to water quality.	Initiate at least 1 approved grant that has a tangible connection to water resources education. Receive 2 grant applications.	1 grant complete. Received 2 grant applications.

PUBLIC EDUCATION AND OUTREACH

CORE ACTIVITY #	Project Name	Description	Goals: Going into 2017	Goals: 2017 Result	
	3.3	Watershed Action Volunteers (WAV)	WAV is a group of volunteer residents that assist with idea development and implementation of outreach opportunities and projects. A new stormdrain stenciling program will allow volunteer groups such as scouts and youth groups to protect our water through stenciling service projects. A new "Adopt-a-Drain" program educates residents and businesses the importance of adopting a stormdrain. WAV also strives to encourage awareness and interaction with local water resources using phenology and basic environmental monitoring.	At least 2 volunteers will help staff community booths more than once. Hold at least 5 WAV meetings. Host at least 3 stenciling service projects, adopt 12 stormdrains, install 1 picture post. Complete at least 1 educational video related to water resources.	1 volunteer helped at booth. 3 WAV meetings held. 3 stenciling projects. 10 drains adopted. 1 picture post in progress. 1 educational video complete.
	3.3	Workshops	Hold raingarden workshops for residents covering watershed processes, raingarden function, and installation how-to. Introduce VLAWMO's cost-share program to participants. In addition to a raingarden workshop, add a native plant workshop based on a survey of past workshop attendees.	Achieve at least 25 raingarden workshop participants. At least 3 residents who attend a raingarden or native plant workshop will pursue a cost-share grant.	44 workshop participants. ___ residents from workshop pursued a grant.



PUBLIC EDUCATION AND OUTREACH

CORE ACTIVITY #	Project Name	Description	Goals: Going into 2017	Goals: 2017 Result	
	3.3	Community Events	Staff a VLAWMO booth at various community events. Develop information and engagement components for community events. A rainbarrel giveaway contest is used to attract event goers, and number of entries signify how many people stopped by the VLAWMO booth. Prizes such as tote bags, boating kits, and craft soda will be provided for free to guests who engage the booth.	Attend at least 5 community events annually. Receive at least 200 entries total in rainbarrel giveaways. Giveaway at least 100 prizes to booth guests.	7 events attended. 93 rainbarrel entries received. Prize giveaway # no longer relevant - undocumented.
	3.3	Communications	Create and update material and publications for social media, website, seasonal Enews, and local publications. Make all sections of the website active. Create and maintain communications to promote public awareness for responsible use of our water resources.	Appear in at least 3 news articles in local papers. Appear in at least 4 City/Township newsletters with opportunities and education. Reach 200 views on website.	3 City/township newsletters. 43 website views.
	3.3	K-12	Develop youth involvement opportunities and programs that improve/benefit VLAWMO's goals and activities: Macroinvertebrates field days, STEM lessons. Reach multiple age demographics through school involvement. Assist schools in establishing and maintaining stormwater best management practices (BMP's).	Reach 10% of the school age population in 2017 through education and BMP maintenance. At least 5 adults will contact VLAWMO about cost-share grants as a result of hearing about their student's school activities.	3% of school age population reached. 0 adults contacting VLAWMO - school reach still developing.
	3.3	Citizen Science	Picture posts will be a new initiative for VLAWMO to explore phenology (ice-out, algae blooms) and AIS monitoring, with support from volunteers. Citizens assist lake monitoring each year through the Citizen Lake Monitoring Program (CLMP).	Install at least 1 picture post in the water for phenology monitoring (AIS, ice-out, foliage, etc.) and display data on VLAWMO website. Volunteers will collect samples for 3 lakes for the 2017 lake monitoring season.	Picture post in progress. 3 lakes for collected by volunteers for monitoring season.

CORE ACTIVITY #



PUBLIC EDUCATION AND OUTREACH - 2018 WORK PLAN

	Project Name	Description	Goals: Going into 2017	Goals: 2017 Results
3.3	Partnerships	Continue support of existing partners and partner activities: NEMO, Watershed partners, local businesses, etc. Provide MS4 education summary for SWPPP; Improve stormwater guidance and information.	Attend meetings with at least 4 partners annually, totaling at least 10 meetings.	6 partnerships with a total of 16 meetings.



MONITORING PROGRAM

SUB-WATERSHED

	Project Name	Description	Goals: Going into 2017	Goals: 2017 Result
Lambert Creek	E. coli Sourcing	Continue wet weather monitoring of the Goose and Whitaker sites (wet weather= during rainfall event).	Address bacteria impairment on Lambert creek through source and transport mechanism identification.	Project complete, final report of last four years in progress.
Lambert Creek	Lambert Creek monitoring program	Monitor basic phosphorus, nitrogen, Chlorophyll A, chloride, and sediment levels at 6 sites along with pH, conductivity and DO at the 3 flumes. Maintain automated flow meter and precipitation gauge at Whitaker.	Document and evaluate the general health of the creek.	Complete
Multiple	Lake Level Program	Gilfillan, Birch, Gem & Goose Lake gauges are calibrated in the spring and read up to 11 times during the summer.	Monitor lake levels on 4 targeted lakes in the watershed to track short & long term trends.	Complete
Multiple	Lake Surveys	VLAWMO will work with Ramsey Conservation District to perform bathymetry and vegetation surveys on Wilkinson and Charley Lakes and with Blue Water Science to perform fish surveys on East & West Goose Lakes and Wilkinson Lake. These surveys assist in determining future management of the lakes.	Complete all identified surveys.	Surveys complete
Multiple	Stormwater Monitoring	Automated and manual sampling, including flow measurements on targeted streams into Birch Lake.	Document watershed nutrient loading into Birch Lake to assist selection of implementation strategies.	Samples collected at 4th and Otter & Wilkinson drainage

MONITORING PROGRAM

Project Name	Description	Goals: Going into 2017	Goals: 2017 Results
Lake Monitoring Program	Monitor chemistry of 12 of VLAWMO's lakes through nutrient and sediment sampling, along with pH, conductivity, and dissolved oxygen (DO) measurements. Continue integration of automated sampling.	Keep water quality record of watershed's lakes. Utilize water quality data for future projects and CIPs.	Complete
Chloride Measurements	Sample lakes and Lambert Creek. Partner with Birch Lake Improvement District (BLID) for summer monitoring of Birch Lake.	Check monthly measurement.	Complete



ADMINISTRATION & REGULATION - 2017 WORK PLAN

Project Name	Description	Goals: Going into 2017	Goals: 2017 Results
Budget & Stormwater Utility	Storm sewer rates are based on the adopted budget and certified to the counties for collection.	Provide necessary financing for watershed.	Complete
Wetland Conservation Act (WCA)	Complete boundary and type & other determinations in consultation with the TEP. Respond to WCA questions.	Administer WCA Rules with VLAWMO as LGU.	All determinations complete for 2017.



SUSTAINABLE LAKE MANAGEMENT PLAN (SLMP) - 2017 WORK PLAN

Project Name	Description	Goals: Going into 2017	Goals: 2017 Results
Charley Lake SLMP	A report covering the sub-watershed of Charley Lake on its health and trends, with lake management plans to sustain its health.	Collect background data, share with lake stakeholders to develop a prioritized list of management strategies.	Complete

LOOKING AHEAD:

2018 goals, plans, and projections

IN THIS SECTION

» 2018 Work Plan

VLAWMO CORE ACTIVITIES



WATER PLAN STRUCTURE



2017 WORK PLAN PROJECTION

VLAWMO will put the 2017-2026 comprehensive water plan into action. The water plan structure (above) informs issues that will be addressed, goals that VLAWMO will set, and the strategies employed to reach those goals. See the 2017-2026 comprehensive water plan on our website under About > Why Water Matters for a more in-depth look at these plan components.

The 2017 work plan on the following pages is color coded according to the VLAWMO core activities diagram above. Each core activity also has a number, conveyed in the 2017-2026 comprehensive water plan.

ACRONYMS:

- WLA: Waste Load Allocation
- DNR: Department of Natural Resources
- MS4: Municipal Separate Storm Sewer System
- NEMO: Northland
- SWPPP: Storm Water Pollution Prevention Program
- STEM: Science, Technology, Engineering, Mathematics
- BMP's: Best Management Practices
- CIP's: Capital Improvement Project
- LGU: Local Governing Unit
- LCCMR: Legislative Citizen Commission on Minnesota Resources
- AIS: Aquatic Invasive Species
- TMDL: Total Maximum Daily Load
- TEP: Technical Evaluation Panel



CAPITAL IMPROVEMENT PROJECTS - 2018 WORK PLAN

SUB-WATERSHED

	Project Name	Description	Goals	Timeline
Sucker-Vadnais	Sucker Lake Channel Restoration	This project is a joint effort in partnership with Ramsey County Parks, Ramsey Conservation District, and the St. Paul Regional Water Service. When completed it will restore approximately 700 linear feet of shoreline that has eroded. Includes fishing access locations to support the current use of the site.	Complete final planting and install educational signs.	Finished by June 2018
Lambert Creek	Whitaker Treatment Wetlands	A stormwater treatment project partnering with the U of MN with funding through LCCMR grant funding. Stormwater from Whitaker Pond will be routed to underground wetland treatment cells and then infiltrated into shallow groundwater. Treatment cells contain different sorption material - the study will determine which material is most effective at filtering pollutants. VLAWMO will monitor for nutrients and bacteria, while the U of MN will monitor for pathogens.	Finalize installation and monitoring plan. Begin year one of two of monitoring.	April 2018 May 2018
Lambert Creek	Goose & Wilkinson Lakes Project Development	VLAWMO worked with consultants in 2018 to assess all data and information collected on these water bodies, engage with stakeholders (see page 14), and determine the next best steps for nutrient reduction. Out of the potential projects that were discovered, work is now directed to selecting a project and its methods. Options include spent lime or alum treatment.	Continue assessment for BMP's, research grant opportunities. Define BMP options.	End of 2018
Lambert Creek	Birch Lake: 4th & Otter Lake Road Project Development	VLAWMO will work with a consultant to assess the options for BMPs at the 4th and Otter Lake Rd site. Conceptual designs of best possible projects will be completed and VLAWMO will work with its partners to finalize design and secure funding for 2018 installation.	Capture stormwater from residential area and reduce nutrients prior to reaching Birch Lake.	Installation by winter 2018

GRANT PROGRAMS - 2018 WORK PLAN

CORE ACTIVITY #	Project Name	Description	Goals	Time line	
	3.4	Landscape Level 1	Establish relationships and provide grants to property owners within the watershed to install water quality enhancement projects.	Install at least 10 projects Achieve .25 lbs of phosphorus/year removed from local waters.	Ongoing
	3.4	Landscape Level 2	Landscape Level 2 Cost Share Program is aimed at assisting landowners with implementing larger BMP projects within the watershed. Preference for projects that have high visibility, educational value and/or local citizen support.	Install at least 1 project. Achieve .25 lbs of phosphorus/year removed from local waters.	Ongoing
	3.3	Community Blue	A communication and outreach grant program to provide money for projects big and small that otherwise might not qualify for other grant awards. Projects must provide education and outreach benefits that directly relate to water quality.	Initiate at least 1 approved grant that has a tangible connection to water resources education.	Ongoing

PUBLIC EDUCATION AND OUTREACH - 2018 WORK PLAN

CORE ACTIVITY #	Project Name	Description	Goals	Time line	
	3.3	Watershed Action Volunteers (WAV)	WAV is a group of volunteer residents that assist with idea development and implementation of outreach opportunities and projects. A new stormdrain stenciling program will allow volunteer groups such as scouts and youth groups to protect our water through stenciling service projects. A new "Adopt-a-Drain" program educates residents and businesses the importance of adopting a stormdrain. WAV also strives to encourage awareness and interaction with local water resources using phenology and basic environmental monitoring.	Volunteer participation to grow 10% WAV email list to reach 100 readers Host at least 3 stenciling service projects, adopt 12 stormdrains, install 1 picture post. Establish a volunteer program with 2 dedicated volunteers with specific role descriptions.	Ongoing
	3.3	Workshops	Hold raingarden workshops for residents covering watershed processes, raingarden function, and installation how-to. Introduce VLAWMO's cost-share program to participants. In addition to a raingarden workshop, add a native plant workshop based on a survey of past workshop attendees.	Achieve at least 25 raingarden workshop participants. At least 3 residents who attend a raingarden or native plant workshop will pursue a cost-share grant.	Workshops: April-May Cost-share: ongoing



PUBLIC EDUCATION AND OUTREACH - 2018 WORK PLAN

		Project Name	Description	Goals	Time line
CORE ACTIVITY #	3.3	Community Events	Staff a VLAWMO booth at various community events. Develop information and engagement components for community events. A rainbarrel giveaway contest is used to attract event goers, and number of entries signify how many people stopped by the VLAWMO booth. Prizes such as tote bags, boating kits, and craft soda will be provided for free to guests who engage the booth.	Attend at least 5 community events annually. Receive 50 entries total in rainbarrel giveaways. Hold a press conference/public opening for Whitaker Treatment Wetlands	April - October
	3.3	Communications	Create and update material and publications for social media, website, seasonal Enews, and local publications. Make all sections of the website active. Create and maintain communications to promote public awareness for responsible use of our water resources.	Appear in at least 6 news articles in local papers. Appear in at least 3 City/Township newsletters with opportunities and education. Reach 200 views on website.	Ongoing
	3.3	K-12	Develop youth involvement opportunities and programs that improve/benefit VLAWMO's goals and activities: Macroinvertebrates field days, STEM lessons. Reach multiple age demographics through school involvement. Assist schools in establishing and maintaining stormwater best management practices (BMP's).	Reach 10% of the school age population in 2018 through education and BMP maintenance. At least 5 adults will contact VLAWMO about cost-share grants as a result of hearing about their student's school activities.	Ongoing
	3.3	Citizen Science	Picture posts will be a new initiative for VLAWMO to explore phenology (ice-out, algae blooms) and AIS monitoring, with support from volunteers. Citizens assist lake monitoring each year through the Citizen Lake Monitoring Program (CLMP).	Install at least 1 picture post in the watershed for phenology monitoring (AIS, ice-out, foliage, etc.) each with a team of dedicated volunteers (5-12) and display data on VLAWMO website. Volunteers will collect samples for 3 lakes for the 2018 lake monitoring season.	May - November

PUBLIC EDUCATION AND OUTREACH - 2018 WORK PLAN

	Project Name	Description	Goals	Time line
3.3	Partnerships	Continue support of existing partners and partner activities: NEMO, Watershed partners, local businesses, etc. Provide MS4 education summary for SWPPP; Improve stormwater guidance and information.	Form one new partnership and sustain previous partnerships with meeting attendance and project development.	Ongoing

MONITORING PROGRAM - 2018 WORK PLAN

	Project Name	Description	Goals	Time line	
SUB-WATERSHED	Lambert Creek	<i>E. coli</i> Sourcing	Dry and wet weather monitoring of the Goose, Oakmede, County Road F, and Whitaker sites (wet weather= during rainfall event). Four-year summary is currently in the works, presentation to be completed in 2018.	Complete final report of four-year project, present report to stakeholders.	Fall 2018
	Lambert Creek	Lambert Creek monitoring program	Monitor basic phosphorus, nitrogen, Chlorophyll A, chloride, and sediment levels at 6 sites along with pH, conductivity and DO at the 3 flumes. Maintain automated flow meter and precipitation gauge at Whitaker.	Document and evaluate the general health of the creek.	April - September
	Multiple	Lake Level Program	Gilfillan, Birch, Gem & Goose Lake gauges are calibrated in the spring and read up to 11 times during the summer.	Monitor lake levels on 4 targeted lakes in the watershed to track short & long term trends.	May - September
	Multiple	Lake Surveys	VLAWMO will work with Ramsey Conservation District to perform bathymetry and vegetation surveys on Wilkinson and Charley Lakes and with Blue Water Science to perform fish surveys on East & West Goose Lakes and Wilkinson Lake. These surveys assist in determining future management of the lakes.	Complete all identified surveys.	Surveys will be completed by Summer 2018 and reports on findings submitted by Fall 2018.
	Multiple	Stormwater Monitoring	Automated and manual sampling, including flow measurements on targeted streams into Birch Lake and Wilkinson Lake.	Document watershed nutrient loading into Birch and Wilkinson to assist selection of implementation strategies.	May - September



MONITORING PROGRAM - 2018 WORK PLAN

SUB-WATERSHED

	Project Name	Description	Goals	Time line
Multiple	Lake Monitoring Program	Monitor chemistry of 12 of VLAWMO's lakes through nutrient and sediment sampling, along with pH, conductivity, and dissolved oxygen (DO) measurements. Continue integration of automated sampling.	Keep water quality record of watershed's lakes. Utilize water quality data for future projects and CIPs.	March - September
Birch	Chloride Measurements	Sample lakes and Lambert Creek. Partner with Birch Lake Improvement District (BLID) for summer monitoring of Birch Lake.	Check monthly measurement.	Jan. - September



ADMINISTRATION & REGULATION - 2018 WORK PLAN

CORE ACTIVITY

	Project Name	Description	Goals	Time line
3.1	Budget & Stormwater Utility	Storm sewer rates are based on the adopted budget and certified to the counties for collection.	Provide necessary financing for watershed.	April - October
3.5	Wetland Conservation Act (WCA)	Complete boundary and type & other determinations in consultation with the TEP. Respond to WCA questions.	Administer WCA Rules with VLAWMO as LGU.	Ongoing



SUSTAINABLE LAKE MANAGEMENT PLAN (SLMP) - 2018 WORK PLAN

	Project Name	Description	Goals	Time line
3.2	Deep Lake SLMP	A report covering the sub-watershed of Deep Lake on its health and trends, with lake management plans to sustain its health.	» Collect background data, share with lake stakeholders to develop a prioritized list of management strategies.	2018

LOGISTICS:
Core operations

 **IN THIS SECTION**

- » WCA Summary
- » Water Standards
- » Local Plan Adoption
- » Biennial Solicitations
- » Partnerships

Wetland Conservation Act (WCA)

VLAWMO administers the Wetland Conservation Act with review. There were 21 landowner contacts in which wetland related technical assistance was provided during 2017. There were 4 potential WCA violation sites investigated, all 4 were resolved.

WCA SUMMARY

Type of Application	Approved	Denied	Withdrawn
Boundary and Type	4	0	0
No-Loss	2	1	0
Exemption	0	0	0
Sequencing	0	0	0
Replacement Plan	0	0	0

Local Plan Adoption

Adoption of Local Plans: Gem Lake, Lino Lakes, North Oaks, White Bear Lake, White Bear Township, Vadnais Heights are all complete and have been adopted.

Member Community	Last Local Water Plan Update Year
Gem Lake	2010
Lino Lakes	2011
North Oaks	2009
Vadnais Heights	2010
White Bear Lake	2007
White Bear Township	2010

Partnerships

One of VLAWMO's greatest successes is working together with partners to use resources wisely and maximize effectiveness. Workshops, meetings, and webinars allow VLAWMO to be on the cutting edge of the water resources in the Northeast Metro.

- » Metro Watershed Partners provides monthly meetings to keep updated with other watersheds, receive feedback and strategy assistance, as well as hear from guest speakers to enhance education and outreach efforts.
- » Ramsey County GIS User Group focuses on sharing, developing, and promoting GIS data and technology. As a member agency, VLAWMO contributes and receives data, and has a voting hand in the content the Group funds and develops. Regular RCGISUG membership fees go to producing aerial images of Ramsey County and other GIS data.
- » Ramsey Conservation District holds informative forums on topics of general concern (AIS, State of the Waters, groundwater). They also provide technical assistance for lake studies and BMP design. Lastly, they provide financial partnership in grant funding of projects.
- » Many other organizations and groups (p. 35) help carry out VLAWMO's mission through events, outreach strategies, and project planning.

Biennial Solicitation for Proposals

Proposals for professional auditing services and legal services will be solicited for in 2018.

2017 Partners

- » **Metro Watershed Partners**
- » **Ramsey County GIS User Group**
- » **Ramsey Conservation District**
- » **Vadnais Heights Economic Development Corp.**
- » **Birch Lake Improvement District**
- » **North Oaks Home Owners Association**
- » **Tamarack Nature Center**
- » **Minnesota Pollution Control Agency**
- » **MN Erosion Control Association**
- » **Conservation Minnesota**
- » **H₂O for Life, SCC Local Cable TV**
- » **White Bear Lake School District, White Bear Preserve Town homes, and Cities in VLAWMO.**

Partnership Highlights

In a field of complex land-use decisions with many interests verging together, partnerships are critical to success. We're grateful for the support and partnerships we built in 2017.

Ramsey Conservation District (RCD) worked with VLAWMO on the lower Kohler streambank restoration that was finished in 2017. They brought technical assistance and grant funding to the project. Staff from RCD also completed vegetation and bathymetric studies on Charlie and Wilkinson lakes in North Oaks.

Our Cities and the Township are always partners on projects within their communities. In 2017 White Bear Lake has partnered on the Birch Lake effort that secured State funding for stormwater runoff improvements at the intersection of 4th and Otter. White Bear Lake also supported and assisted our effort to study Goose Lake in the pursuit of identifying cost-effective ways to address the lake (VLAWMO's most impaired lake). White Bear Township has been a great partner in the creation of the Whitaker Treatment Wetlands, located at the start of Lambert Creek in Columbia Park.

Education and Outreach efforts have been expanded through valuable connections to H₂O for Life and the Vadnais Heights Economic Development Corporation (VHDEC). New opportunities with school and business outreach are now possible for 2018.

The cost-share and Landscape 1 & 2 programs remain popular as we partner with homeowners and businesses throughout the watershed.



DOLLARS AND CENTS:

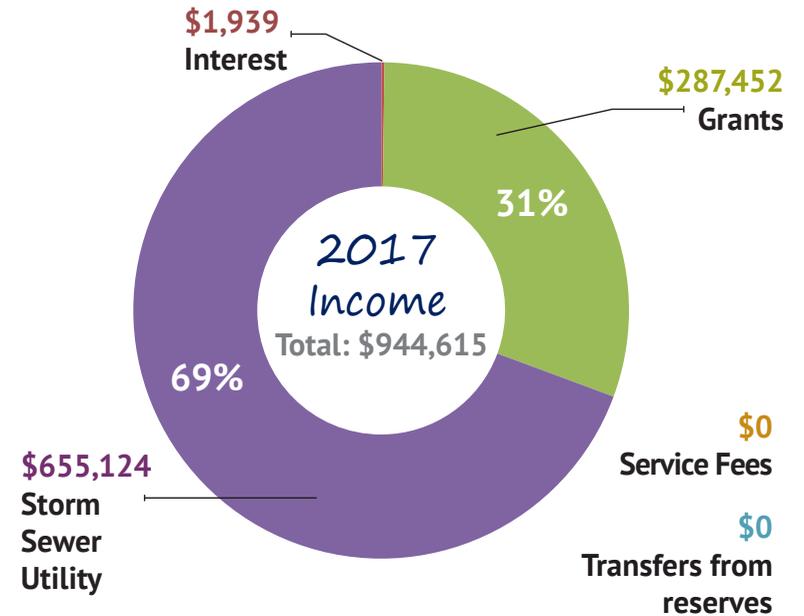
Financial statement and budget

IN THIS SECTION

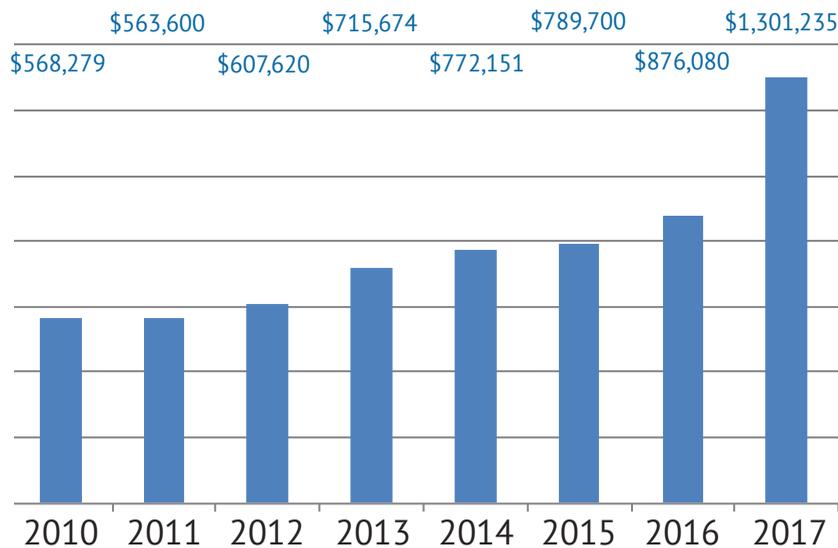
» Finance and Budget

Finance and Budget

The 2017 budget was established by the Board of Directors in June 2016 with carry over project and program funds added in December 2016. The Budget and Finance Committee with members from the Technical Commission and the Board reviews and makes recommendation on the budget to the Board. Two important changes to the budget happened in 2017. The budget was reorganized to reflect the implementation of the updated VLAWMO Water Plan. The Board also directed the operations, program and project budgets no longer be subsidized by VLAWMO reserves.

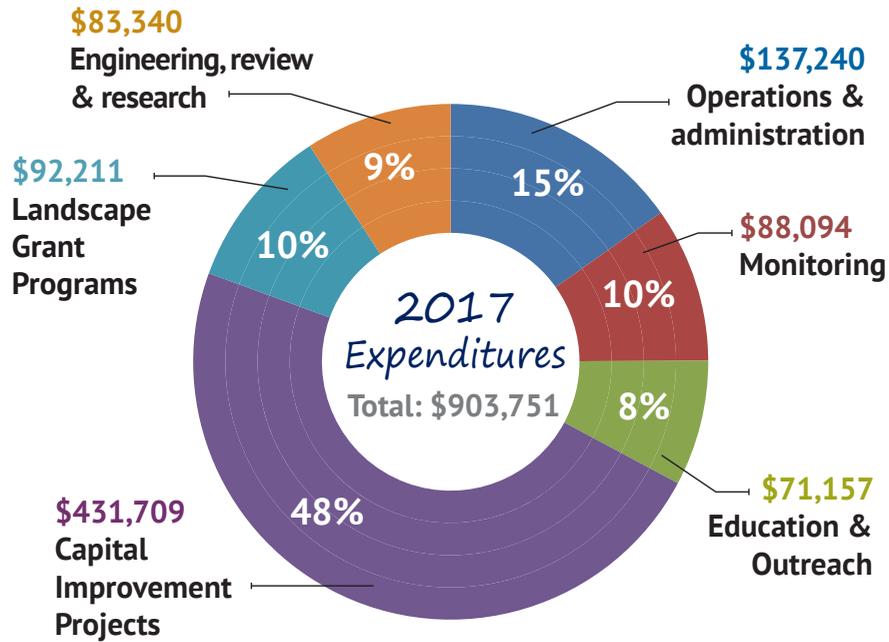


VLAWMO Budget with Fund Balance



INCOME

The mainstay of support for VLAWMO work comes from its Storm Sewer Utility (SSU) fees. These fees are based on an estimate of impervious surface for each parcel of land that is in line with its land use classification. \$564,360 in SSU was certified to Ramsey and Anoka Counties. The average single family homeowner paid \$32.43 per year to support all of the projects and programs conducted by the watershed. That’s about \$2.70 per month. The 12.1% increase in storm sewer utility fees reduced the drain on reserves. No reserve funds were needed in 2017. Ongoing projects resulted in a significant amount of funding being carried over from 2016 to 2017.



EXPENSES

Total cash expenses for 2017 were less than budgeted at \$903,749. This was an increase from 2016 and reflects funding that will be carried over for planned projects. The Whitaker treatment cells project kicked off in 2017 with the help of grant funding from the Legislative Citizens Commission for Minnesota Resources. Several studies were also completed setting the stage for the next phase of projects. Further detail is available in the annual audit attached as an Appendix to this Report.

GRANTS AND PARTNERSHIPS

Grant funds received in 2016 included both direct and indirect funding. Wetland Conservation Act reimbursement funds totaled \$3360. Partnerships have facilitated indirect grant funding for projects implemented with VLAWMO. Ramsey Conservation District applied for and received \$50,000 in State funding for the lower Kohler restoration project. Most of the project was installed in late 2016 with the grant funding passing through the VLAWMO budget in 2017.

RCD also secured state funding for the Sucker channel restoration project which will be installed in 2017-2018. Funding was carried over to 2018. Other cost-sharing partners include Ramsey County Parks and Recreation and St. Paul Regional Water Service. Partner contributions make the Sucker channel restoration possible but are not be reflected in the VLAWMO budget. The public will have the benefit of a long-awaited channel restoration project the will offer multiple benefits.



A baby bluegill caught and released during a Goose Lake fish survey.

CAPITAL IMPROVEMENT PROJECTS

Installation started for pilot wetland treatment cells above Whitaker pond thanks to the LCCMR grant for \$500,000. The grant will allow VLAWMO to install treatment wetlands in White Bear Township near the outlet of Dillan ditch as it empties into Lambert Creek. The focus will be on the removal of bacteria, nutrients and other pollutants. A linked study on pathogens will be done by the University of Minnesota. Funding will be carried over to the 2018 budget.

WHO WE ARE:

The people
behind VLAWMO

 **IN THIS SECTION**

- » Staff
- » Consultants
- » Board of Directors
- » Technical Commission (TEC)

The VLAWMO office is located at:
800 E County Road E
Vadnais Heights, MN
55127

Who we are:

VLAWMO Employs five full-time staff for everyday operations. Consultants are required for a variety of purposes including auditing, bookkeeping, engineering, and technical assistance. The VLAWMO Board of Directors consists of one elected official from each of the six cities within the watershed. Each board member is appointed for a three year term. The VLAWMO Technical Commission consists of one citizen representative from each of the six cities. The Technical Commission meets to review and consider watershed business as well as make recommendations to the Board for wider scope decisions.

BOARD OF DIRECTORS (BOD)**Primary Directors****Dan Jones, Vice Chair**

1956 Lakeaires Blvd
White Bear Lake, MN 55110
651.283.6097

Jim Linder, Treasurer

4200 Otter Lake Rd
Gem Lake, MN 55110
651.492.5083

Marty Long

10 Larch Lane
North Oaks, MN 55127
651.407.8507

Ed Prudhon

470 Otter Lake Rd
White Bear Twp, MN 55110
651.426.2311

Terry Nyblom

715 Hiawatha Ave
Vadnais Heights, MN 55127

Rob Rafferty

1573 Merganser Ct
Lino Lakes, MN 55038
651.982.2492

Alternate Directors

Bill Walsh
White Bear Lake

Jim Linder
Rick Bosak
Gem Lake

Gregg Nelson
North Oaks

Bob Kermes
White Bear Township

Craig Johnson
Vadnais Heights

Dave Roeser
Lino Lakes

TECHNICAL COMMISSION (TEC)**Commissioners can be reached by contacting VLAWMO**

Primary
Mark Graham, Chair
Vadnais Heights

Gloria Tessier
Gem Lake

Jim Grisim
White Bear Lake

Bob Larson, Treasurer
North Oaks

Paul Duxbury
White Bear Township

Marty Asleson
Lino Lakes

Alternate
Kevin Watson
Vadnais Heights

Gretchen Artig-Swomley
Gem Lake

Dale Bacon
White Bear Lake

Diane Gorder
North Oaks

No alternate available
Gem Lake

No alternate available
Lino Lakes

STAFF

Stephanie McNamara**Administrator**

stephanie.o.mcnamara@vlawmo.org
651.204.6073

Kristine Jenson**Program Manager**

kristine.jenson@vlawmo.org
651.204.6074

Brian Corcoran**Water Resources Manager**

brian.corcoran@vlawmo.org
651.204.6075

Nick Voss**Education and Outreach Coordinator**

nick.voss@vlawmo.org
651.204.6070

Tyler Thompson**GIS Watershed Technician**

tyler.thompson@vlawmo.org
651.204.6071

CONSULTANTS

Abdo, Eick & Meyers LLP.

5201 Eden Ave. Ste. 250
Eden Prairie, MN 55436
952.835.9090

Burns & McDonnell

8201 Norman Center Dr
Bloomington, MN 55437
952.656.6003

Ehlers & Associates

3060 Centre Point Dr
Roseville, MN 55113
651.697.8500

HDR Engineering, Inc.

701 Xenia Ave. S. Ste. 600
Minneapolis, MN 55416
763.591.5400

Houston Engineering Inc.

6901 E Fish Lake Rd
Maple Grove, MN 55369
763.493.4522

Humphrey Bookkeeping

14214 Geneva Way North
Hugo, MN 55038
651.426.4900

Kennedy & Graven, Chartered

200 South Sixth St Ste. 470
Minneapolis, MN 55402
612.337.9215

Ramsey Conservation District

1425 Paul Kirkwood Dr
Arden Hills, MN 55112
651.266.7270

St Paul Regional Water Service

1900 Rice St
St Paul, MN 55113
651.266.6350

Wenck Associates

1800 Pioneer Creek Center
P.O. Box 249
Maple Plain, MN 55359
763.479.4200

