

Volunteer Coordination and Training for the Lake Champlain Cyanobacteria Monitoring Program



July 2018

Final Report

Prepared by:

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Lake Champlain Committee

For:

The Lake Champlain Basin Program and

New England Interstate Water Pollution Control Commission

This report was funded and prepared under the authority of the Lake Champlain Special Designation Act of 1990, P.L. 101-596 and subsequent reauthorization in 2002 as the Daniel Patrick Moynihan Lake Champlain Basin Program Act, H. R. 1070, through the US EPA. Publication of this report does not signify that the contents necessarily reflect the views of the states of New York and Vermont, the Lake Champlain Basin Program, or the US EPA.

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NEIWPCC Job Code: 0993-003-001
Project Code: L-2017-041
Prepared by: Lori Fisher
Lake Champlain Committee
Date Submitted: 1/30/18; Updated 4/26/18
Date Approved:

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This project was funded by an agreement awarded by the Environmental Protection Agency to the New England Interstate Water Pollution Control Commission in partnership with the Lake Champlain Basin Program. NEIWPCC manages LCBP's personnel, contract, grant, and budget tasks and provides input on the program's activities through a partnership with the LCBP Steering Committee.

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Executive Summary

A Lake Champlain cyanobacteria monitoring program has been in place since 2002. The Lake Champlain Committee (LCC) initiated a citizen-based near-shore monitoring program in 2003 and has expanded the network of trained volunteers and monitoring sites since that time. The monitoring program is an effective collaboration with the Vermont Department of Environmental Conservation (VT DEC), Vermont Department of Health (VDH) and participating New York agencies. The program includes New York, Vermont and Quebec monitoring sites. Since 2012, VT DEC has had primary responsibility for program oversight including Quality Assurance/Quality Control (QA/QC) procedures. Funding for LCC's portion of the monitoring program was provided by the Lake Champlain Basin Program and private donations.

This report covers LCC's portion of the on-going Lake Champlain cyanobacteria monitoring program for the period between June 1, 2017 and December 31, 2017 and focuses on monitoring season preparation, recruitment and training of volunteers, monitor season reporting, and analysis of the season. LCC trains and supports a network of volunteers who monitor for cyanobacteria at shoreland locations on Lake Champlain and at several inland Vermont lakes. LCC also assists in training water supply operators and state and municipal recreational personnel at Lake Champlain parks and beach areas. LCC's data collection complements those of VT DEC and is integrated into a program that includes qualitative observations and quantitative analysis. LCC vets all of the monitor observations before they are approved for public viewing on a cyanobacteria data-tracker map housed on the VDH website. LCC also communicates results via our website, weekly emails to monitors and a list-serve of interested citizens, and through media releases and social media avenues. LCC's outreach also focuses on how to recognize and respond to cyanobacteria blooms.

Objectives of the Lake Champlain/Inland VT Lakes Citizen Monitoring Program

- recruit, train and support a cadre of volunteer cyanobacteria monitors for Lake Champlain and select Vermont inland lakes that have experienced periodic cyanobacteria blooms;
- coordinate efforts with VT DEC and VDH in a program that provides both qualitative and quantitative data at selected Lake Champlain locations and tests for the presence of cyanotoxins when algal density and composition triggers are reached at select monitoring locations;
- facilitate communication about lake conditions through timely postings to VDH web page, weekly emails to monitors and list-serve and through media releases and social media outreach; and
- provide outreach and assistance to beach managers, lakeshore property owners and the public so they can learn to recognize and respond appropriately to the presence of cyanobacteria blooms.

For the 2017 monitoring season LCC produced and updated a series of resource materials, offered 23 formal training sessions and trained nearly 300 potential monitors, interested citizens and municipal and state park personnel. LCC staff and monitors consistently reported from 117 locations on Lake Champlain and 11 on Vermont inland lakes. LCC volunteer monitors submitted an average of 75 observations of water conditions per week from mid-June of 2017 into November 2018. Report frequency was heavier during the heart of summer and tailed off on either end in keeping with the seasonal use and openings and closings of park and beach areas. Over 1750 site-specific reports were submitted during the

2017 monitoring season from Lake Champlain and Vermont inland lakes. Of those reports, 1486, or 85% of the reports were submitted by monitors trained and supported by LCC.

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1 Project Introduction

Background

Lake Champlain is one of the largest lakes in the United States and an important water resource for the states of Vermont and New York, and the province of Quebec. The lake is a drinking water source for nearly 200,000 people, a prime recreational resource for residents and visitors, and the economic driver for the region. The regional tourism economy is heavily dependent on the lake health and water quality. Cyanobacteria blooms have been documented in the lake since the 1970s, with some areas experiencing extensive annual blooms. In 1999, several dog deaths were attributed to cyanobacteria toxins, raising health and safety concerns regarding drinking water supplies and recreational activities such as swimming, boating and fishing. Public concern about cyanobacteria blooms remains high.

Cyanobacteria, also referred to as blue-green algae, are a natural and normal component of the phytoplankton in freshwater and are present in Lake Champlain during much of the summer (Watzin et al 2011, LTM unpublished data). Cell counts and associated toxins are below levels of concern in most of the lake each year (Watzin et al, 2011). St. Albans and Missisquoi bays typically experience annual periods of high cyanobacteria density lasting several weeks, though, based on targeted sampling efforts, conditions rarely exceed Vermont's recreational guidance criteria of 6µg/L.

History of Cyanobacteria Monitoring on Lake Champlain

A Lake Champlain cyanobacteria monitoring program has been in place since 2002. The Lake Champlain Committee (LCC) initiated a citizen-based near-shore monitoring program in 2003 and has expanded the network of trained volunteers and monitoring sites since that time. The monitoring program is an effective collaboration with the Vermont Department of Environmental Conservation (VT DEC), Vermont Department of Health (VDH) and participating New York agencies. From 2002 to 2011, the Lake Champlain Basin Program provided the majority of funding for the annual cyanobacteria monitoring program which utilized cell density and toxin data to evaluate recreational conditions around the lake. Results were communicated to stakeholders around the region through weekly updates. The University of Vermont (UVM) developed and implemented the program, in cooperation with LCC, VT DEC and VDH. The monitoring program was well received locally and served as a model at the regional and national level.

Beginning in 2012, the volunteer monitoring portions of the program coordinated by LCC transitioned from an analytically intensive sampling based system to a more qualitative observational system. This change enabled us to expand the monitoring network to underserved areas of the lake while continuing to provide the information necessary to inform recreational and public health response in a fiscally sustainable program. The volunteer monitoring complemented on-going analytical sampling and analysis conducted by VDH and VT DEC. Since 2012, VT DEC has had primary responsibility for program oversight including Quality Assurance/Quality Control (QA/QC) procedures.

Financial Support

Funding for LCC's portion of the 2017 monitoring program was provided by the Lake Champlain Basin Program and private donations.

Report Focus

This report covers LCC's portion of the on-going Lake Champlain cyanobacteria monitoring program for the period between June 1, 2017 and December 31, 2017 and focuses on monitoring season preparation, recruitment and training of volunteers, monitor season reporting, and analysis of the season. LCC trains and supports a network of volunteers who monitor for cyanobacteria at shoreland locations on Lake Champlain and at several inland Vermont lakes. LCC also assists in training water supply operators and state and municipal recreational personnel at Lake Champlain parks. LCC's data collection complements those of VT DEC and is integrated into a program that includes qualitative observations and quantitative analysis. LCC vets all of the monitor observations before they are approved for public viewing on a cyanobacteria data-tracker map housed on the VDH website. LCC also communicates results via our website, weekly emails to monitors and a list-serve of interested citizens, and through social media. In order to educate and engage the broader public on this issue, LCC's outreach also focuses on how to recognize and respond to cyanobacteria blooms.

Objectives of the Lake Champlain/Inland VT Lakes Citizen Monitoring Program

The objectives of the LCC cyanobacteria monitoring program are to:

- recruit, train and support a cadre of volunteer cyanobacteria monitors for Lake Champlain and select Vermont inland lakes that have experienced periodic cyanobacteria blooms;
- coordinate efforts with VT DEC and VDH in a program that provides both qualitative and quantitative data at selected Lake Champlain locations and tests for the presence of cyanotoxins when algal density and composition triggers are reached at select monitoring locations;
- facilitate communication about lake conditions through timely postings to VDH web page, weekly emails to monitors and list-serve and social media outreach; and
- provide outreach and assistance to beach managers, lakeshore property owners and the public so they can learn to recognize and respond appropriately to the presence of cyanobacteria blooms.

Overview of 2017 Trainings & Results

For the 2017 monitoring season LCC offered 23 training sessions and trained nearly 300 potential monitors, interested citizens and municipal and state park personnel. LCC staff and monitors reported from 117 locations on Lake Champlain and 11 on Vermont inland lakes (Appendix A). LCC volunteer monitors submitted an average of 74 observations of water conditions per week over a 20-week period running from mid-June of 2017 through early November. (Report frequency was heavier during the heart of summer and tailed off on either end in keeping with the seasonal use and openings and closings of park and beach areas.) Over 1750 site specific reports were submitted during the 2017 monitoring season from over 150 locations on Lake Champlain and Vermont inland lakes as part of the collaborative program. Of those reports, 1486, or 85% of the reports were submitted by monitors trained and supported by LCC.

2 Tasks Completed and Methodology

Recruitment

LCC recruited monitors broadly through a variety of mediums and the training sessions were publicized through media outreach, public events, presentations, emailings and social media. Sign-in sheets for LCC programs throughout the year included a check-off box to indicate interest in serving as a monitor or receiving weekly updates during the monitoring season. These options were also conveyed through mailings and emailings to LCC members and lake residents throughout the year. LCC's website further reinforced the program with [web pages dedicated to information on cyanobacteria and the monitoring program](#), [a volunteer response form](#) and online forms to indicate [interest in monitoring](#) or sign up for [weekly informational reports](#).

While we attempted to gain a wide geographic distribution of monitoring sites, no interested volunteer willing to commit the time to training and reporting was turned away. In a few areas of the lake, this did lead to a cluster of observation points. The volunteer monitor program has an impact beyond the recruitment of volunteers and collection of data. There is widespread public concern about cyanobacteria. While not all trained volunteers go on to report, all become familiar with cyanobacteria, potential health risks associated with them, the water quality conditions that increase the likelihood of blooms, and individual actions they can take to improve water quality.

Training Sessions

For the 2017 season, LCC trained nearly 300 potential monitors during 23 formal training sessions around the Lake Champlain Basin. A separate online training session was held for watershed organizations and interested citizens in the Lake Memphremagog region. LCC also provided training for municipal and state recreational staff and assisted VT DEC and VDH with training for Vermont drinking water facility operators. Throughout the year we also held informal information sessions about cyanobacteria as part of larger presentations on water quality.



*Cyanobacteria Monitor Training session
for Burlington Recreation staff.
Photo by Lori Fisher.*

LCC's cyanobacteria monitor training sessions covered:

- background on cyanobacteria;
- causes and conditions that favor blooms;
- health concerns;
- management efforts and citizen actions to reduce blooms;
- appearance and how to distinguish cyanobacteria from other lake phenomena;
- categorization of water conditions and blooms;
- photographic and water sampling requirements;
- reporting protocols; and
- instructions for filling out both the VDH and LCC online reporting forms.

Attendees get detailed guidance on how to assess conditions and are provided with links to a series of online tools to aid their reporting. Monitors were provided with gloves for taking water samples and thermometers for temperature checks.

The guidance materials are available on the Lake Champlain Committee website (lakechamplaincommittee.org) and reiterated in all our weekly emails with hyperlinks so that monitors could continually refer to the instructions throughout the season. Citizens who attended training sessions or received our reports were encouraged to distribute the information to friends and neighbours. LCC also has online resources to educate anyone visiting our website about cyanobacteria. Information covered includes:

- [cyanobacteria in Lake Champlain](#);
- [the cyanobacteria monitoring program](#) ;
- [how to stay informed](#);
- [what to do if you see a bloom](#);
- [actions to take to reduce blooms](#);

Training materials for the monitors were based on the Vermont Department of Health's *Blue-green Algae (Cyanobacteria) Guidance for Vermont Communities* as well as input from monitors and were reviewed by VT DEC and VDH.

Monitoring Requirements

Monitors were asked to commit to monitoring at least one location for the duration of the monitoring period (mid-June to September). All volunteers attended a mandatory training session to learn to recognize cyanobacteria, become familiar with the assessment protocol, and learn how to submit their weekly reports. Monitors are trained to make their weekly observations between 10 AM and 3 PM on roughly the same day of the week. If they observed bloom conditions outside of their regular reporting period they were asked to file supplemental reports as soon as possible. Any time blooms were observed monitors were encouraged to submit daily reports until after the bloom dissipated. LCC staff met with or interacted with each volunteer in the weeks following the training to ensure reporting consistency among volunteers and provide

ongoing support. Not all volunteers were able to use the internet-based reporting system and instead submitted their reports by telephone or email.



Monitors are provided with gloves and thermometers and trained how to assess and report on conditions. Photo by Sheila

Three-tiered Visual Assessment Approach

Volunteer monitors were taught to assess cyanobacteria conditions using a three-tiered visual system outlined at the training sessions and in the training materials. They identified conditions and assigned them to one of three categories:

- Category 1 - very few or no cyanobacteria observed, recreational enjoyment not impaired by cyanobacteria. (Category 1 contained subcategories of ratings from 1a through 1d).
- Category 2 - cyanobacteria present at less than bloom levels.
- Category 3 - cyanobacteria bloom in progress.

Monitors also had the option to report 'little cyanobacteria present but enjoyment of water not impaired' (category 1d - a subset of category 1). This language mimics the lake-user surveys conducted between 1987 and 1991 that formed the basis for the Lake Champlain water quality standards.

In the event that monitors observed cyanobacteria blooms (category 2 or 3 conditions), they were asked to submit photographic documentation. We requested three photographs: a close-up of the water, a broader view to evaluate the extent of the bloom, and a water sample in the bottle to help distinguish colour and give cyanobacteria a chance to float toward the water surface. Photographs allowed us to check the monitor's assessment. If we disagreed with a monitor's categorization, we followed up to provide further guidance. When possible, monitors observing category 2 or 3 conditions reported daily through the duration of the bloom. Any time monitors reported blooms, LCC followed up with them to encourage daily reporting.

LCC approved reports submitted directly by volunteers to the VDH web interface and uploaded any sent submitted solely to LCC as quickly as possible. Category 2 and 3 reports were prioritized, shared with VT DEC and VDH partners, and posted right away following verification.

Quantitative Monitoring

Four shoreline monitoring locations, Shipyard in Highgate, St. Albans Bay Park, North Beach in Burlington, and Red Rocks in South Burlington, were designated sites of high risk/high concern due to the presence of drinking water facilities or high recreational usage. At these locations, volunteers made visual observations and also collected water samples from the shore. These volunteers received additional training in water assessment and testing. Volunteers delivered whole water samples to the VDH laboratory where they were analyzed for microcystin, anatoxin and cyanobacteria density.

Monitoring Season

The official monitoring season began the weekend of June 18, 2017 and ran through September 30, 2017. The reporting start was delayed by a week due to issues with the cyanobacteria data tracker. Some monitors continued to file reports through early November if conditions warranted and they were available and had access to sites. Some monitors reported over a 20-week season.

Reporting & Publicity of Results

Monitors' observations were received via an on-line form available on the Lake Champlain Committee website, by phone, or were directly entered into the Vermont Department of

Health cyanobacteria tracker. For reports that were entered into the VDH tracker, partners received automated notification of alert level reports posted to the tracking database. This facilitated communication and enabled quick review, approval and public posting of cyanobacteria blooms.

Each monitor was provided with a user name and password for the VDH tracker and trained how to submit online reports. The LCC online form provided a back-up option for monitors who had trouble using the VDH site and form or during times when the VDH site had technical issues. Additionally, LCC took verbal reports on conditions when monitors were not able to access online reporting forms.

Once approved by an administrator from LCC, VDH, or VT DEC, the monitors' reports appeared live on the public VDH tracker web-site which is accessible to anyone with internet access.

Monitors and partners received a weekly email summarizing water conditions on the lake each Friday or Saturday (example at Appendix D). The weekly updates also included a photograph of conditions observed that week, monitor's individual user names and passwords, links to resource materials including the online materials, relevant information and reporting tips, and actions to take to reduce bloom frequency. This way monitors always had easy access to information to file accurate reports. The weekly emails also served to continue educating recipients about cyanobacteria. A separate weekly update report was provided to interested citizens and area media (examples at Appendix E and F). Weekly updates and notices of cyanobacteria blooms were also posted on LCC's website and Facebook pages, relayed to some Front Porch Forum outlets, and promoted through additional emails and e-newsletters as relevant.

3 Quality Assurance Tasks Completed

There were no Quality Control requirements on the visual observations. However, LCC reviewed all reports for logical consistency and errors before entering the data into VDH tracker. In cases where we changed categorizations or required additional information we always contacted monitors to explain our decisions and provide them with the background and support they needed to correctly assess conditions. We also contacted monitors from high priority sites if they were delinquent in their reporting and followed up with anyone who appeared to have trouble filing complete reports. Phytoplankton samples from four priority locations were delivered to the VDH laboratory as unfiltered whole water. Any further laboratory analysis and QA was conducted at the laboratory.

4 Deliverables Completed

Resource Materials

A large portion of the pre-season work focused on developing and refining education and outreach materials and recruiting monitors for a successful season. We expanded our website content about cyanobacteria and updated guidance materials on cyanobacteria (see

Appendix B for links to examples). We also updated our informational materials to use the term "cyanobacteria" rather than "blue-green algae" for scientific accuracy. This approach was also generally adopted by program partners to help foster consistent public messaging.

Training Sessions

LCC conducted 23 formal training sessions around the Lake Champlain Basin. General sessions, open to any interested person, were held at Charlotte Town Hall, the offices of the Lake Champlain Basin Program (multiple sessions) in Grand Isle, Missisquoi National Wildlife Refuge in Swanton, the Plattsburgh public library, Kill Kare State Park in St. Albans, Kingsland Bay State Park in Ferrisburgh, Noblewood Park Pavilion in Willsboro, the Shelburne town offices (multiple sessions), and the office of the Lake Champlain Committee in Burlington (multiple sessions). Training sessions for staff who regularly work on the water were held for the Vermont State Park staff in the northwest and southwest districts, and Lake Champlain Basin Program boat launch stewards. Additionally we hosted special trainings for interested personnel and summer seasonal staff for nine groups:

- the Burlington Community Sailing Center,
- Burlington Parks, Recreation and Waterfront,
- Charlotte Recreation,
- Colchester Parks and Recreation,
- Plattsburgh City Beach, Shelburne Parks and Recreation,
- South Burlington Recreation and Parks,
- St. Albans Parks and Recreation Department,
- St. Albans Public Works Department,
- Willsboro Department of Recreation

We also did a webinar training for Lake Memphremagog monitors and interested citizens and held a special training session for LCC Board members.

LCC participated in additional sessions at the request of VT DEC and VDH. LCC provided cyanobacteria monitor training sessions for public water suppliers with in-takes on Lake Champlain during a series of outreach sessions put together by the VT DEC and Vermont Rural Water Association. These training sessions were part of a program initiated in 2015 to test raw and finished water for cyanotoxins. LCC provided also training for volunteers on Lake Carmi, Lake Iroquois, Lake Memphremagog, and Shelburne Pond to assist with inland lake monitoring at those locations. We also reviewed reports and supported monitors for those locations throughout the season.

LCC provided ongoing support to monitors throughout the season via in-person meetings, over the phone consultation, emailings and weekly reporting.

Report Vetting

During the summer monitoring season from mid-June through early November, LCC received and approved an average of 74 reports per week from volunteer monitors. Reporting frequency was highest during the heart of the summer and diminished after Labor Day when most park areas closed and seasonal residents moved away from the lake. We also continued to monitor conditions through mid-November at select locations as Lake Carmi experienced sporadic blooms from mid-August through early November.

As in past years, we distinguished between regular reports and supplemental reports. "Regular" reports are those filed by monitors as part of their regular weekly reporting. "Supplemental" reports are those received outside of the weekly reporting period or submitted by people who don't monitor regularly. By distinguishing between regular and supplemental reports we are better able to understand the probability of a bloom occurring at a given location while still collecting valuable information to inform public health alerts. Supplemental reports are biased toward reporting bloom conditions. Random observers of the lake do not submit reports of the lake's regular day-to-day condition; they only report when they see something out of the ordinary. Yet supplemental reports help capture the patchy distribution of blooms in space and time, and it is important to inform the public when such blooms occur so they can more reasonably avoid them. The regular weekly reports provide a check on observer's inclination to report only bloom conditions, and provide a better assessment of the lake as a whole.

Outreach

Each week during the monitoring season we generated weekly reports for monitors providing them with a compilation of reports from that week and providing them with their user name, password, resource links and other information for successful reporting. A separate weekly email about conditions was sent to the media and interested citizens. LCC promoted the weekly emails through outreach to our members and the general public, Facebook posts, Enewsletters, and [our website](#). Weekly updates on conditions were also provided via Facebook posts, website updates and Front Porch Forum. We also distributed information to the press, conducted media interviews and held informational meetings about cyanobacteria.

LCC fielded requests from the Associated Press, The Burlington Free Press, Seven Days, Vermont Digger, Vermont Public Radio, Vermont Public Television, New England News Network, North Country Radio, AMC Radio, the University of Vermont publications and other media outlets to provide interviews and/or background on cyanobacteria.

Results

We extended the monitoring season and had a greater number of monitors continue to report into the early fall. Over 1,750 site specific monitoring reports were filed by LCC staff and volunteers and project partners during the 2017 season. Most of these were from Lake Champlain but regular reports were also provided from volunteer monitoring LCC oversaw on Vermont lakes Carmi, Iroquois and Memphremagog and Shelburne Pond. Additional supplemental reports were received from locations not monitored regularly, made outside the weekly reporting day by LCC volunteers, or provided by the public. Reports based on the visual assessment protocols accounted for the vast majority of the total reports received. Reports from sites using both the tiered alert system and visual assessment protocols were under ten percent of the total.

Cyanobacteria Conditions on Lake Champlain and Inland Lakes

As in years past, the majority of monitoring reports noted generally safe conditions on Lake Champlain and at several of the inland lakes we oversaw. However, there were both low and high alert conditions reported throughout the season and in some areas, cyanobacteria blooms were severe. Eighty-five percent of the monitoring reports received in 2017 indicated that few or no cyanobacteria were present (category 1 of the visual protocol). In

all, 259 regular or supplemental reports of bloom conditions were received, during the 2017 monitoring season, 15% of the total reports received. For Lake Champlain, 88% of the reports from 2017 indicated generally safe conditions. Alert-level conditions were reported 186 times, 119 as supplemental reports (Figure 1 below), approximately 12% of the reports submitted (Figure 2 below). Alert level conditions were reported most frequently in Missisquoi Bay and St. Albans Bay in 2017 (Figure 3 below). The number of alert level reports was higher than in 2016 but similar to the number reported in 2015.

The summer began relatively cool and wet, culminating with lower than normal temperatures in late August. This was followed by higher than normal temperatures throughout the region which lasted through early November. The early summer nutrient loading, followed by hot, sunny, still days stimulated persistent and extensive late season cyanobacteria blooms across the region which lasted into the fall in some areas. The Main Lake section of Lake Champlain, along with St. Albans Bay and Lake Carmi were particularly impacted. Shelburne Pond also has a history of frequent cyanobacteria blooms and reports provided by the LCC volunteer monitoring the boat launch area noted blooms there beginning in late June. Lake Memphremagog and Iroquois experienced good conditions most of the summer, though both were affected by the unusual late season weather. Lake Iroquois experienced short-lived blooms in early August and late September. Low alert conditions were reported from the Newport city dock on Lake Memphremagog in mid-September.

Cyanotoxin sample efforts done by the monitoring partners continue to target bloom situations whenever possible. Because microcystin concentrations are expected to be highest in these situations, this targeted sampling increases the opportunity to capture high microcystin events. Despite targeted sampling efforts, over the last six summers, microcystin concentrations exceeding Vermont's recreational guideline of 6µg/L are rarely documented and have occurred only in Missisquoi Bay. In 2017, microcystin was detected at multiple locations on Lake Champlain and Lake Carmi. The Vermont recreational guidance value was not reached, but concentrations did exceed 4 µg/L on several occasions in Lake Champlain (Shipyard – Missisquoi Bay, August 8 – 5.1 µg/L; Charlotte Town Beach, September 25 – 4.25 µg/L; North Beach, September 26 - 4.4 µg/L; LTM 51 – October 5 – 5.6 µg/L).

Details of the toxin sampling analysis is available from the Cyanobacteria Monitoring on Lake Champlain Summer 2017 report filed by the Vermont Department of Environmental Conservation (Shambaugh et al, 2017). The complete monitoring data can be downloaded from the VDH website at

<https://apps.health.vermont.gov/vttracking/cyanobacteria/2017summary/index.html>).

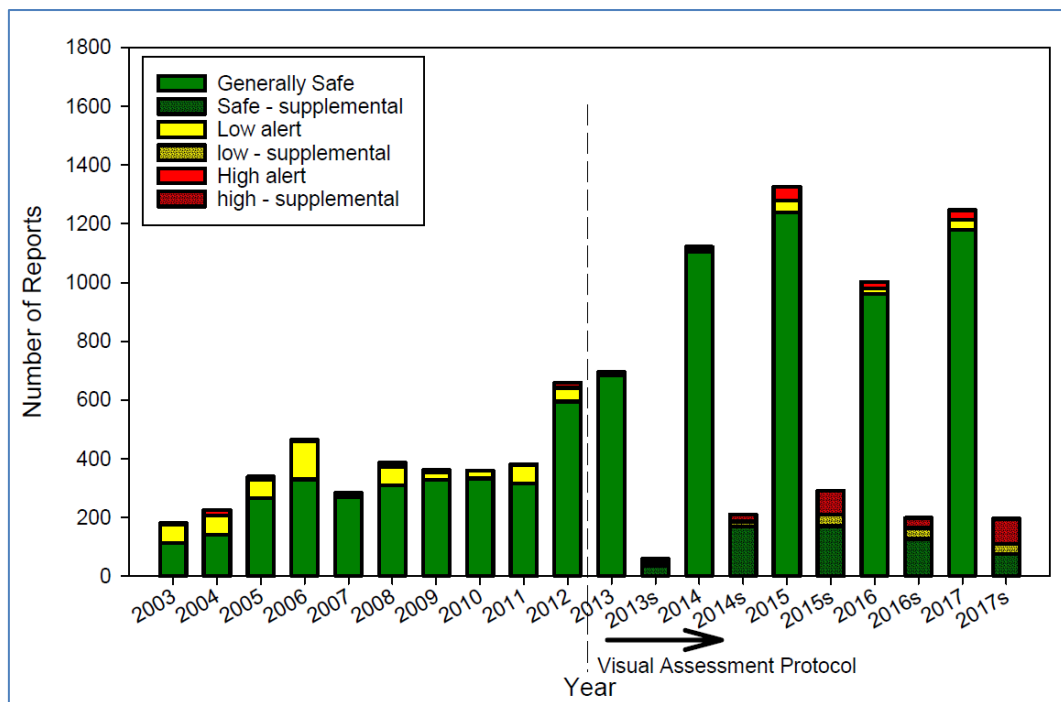


Figure 1 Number of yearly cyanobacteria status reports for Lake Champlain by category. Records prior to 2012 were determined using historical cell count and toxin data. Beginning in 2012, summaries include records obtained using the visual assessment protocol. The status generated by the visual assessment protocol is used at locations where both types of assessment were employed. Supplemental reports are included separately, indicated by an 's' following the year on the x axis. (Table courtesy of Angela Shambaugh, VT DEC.)

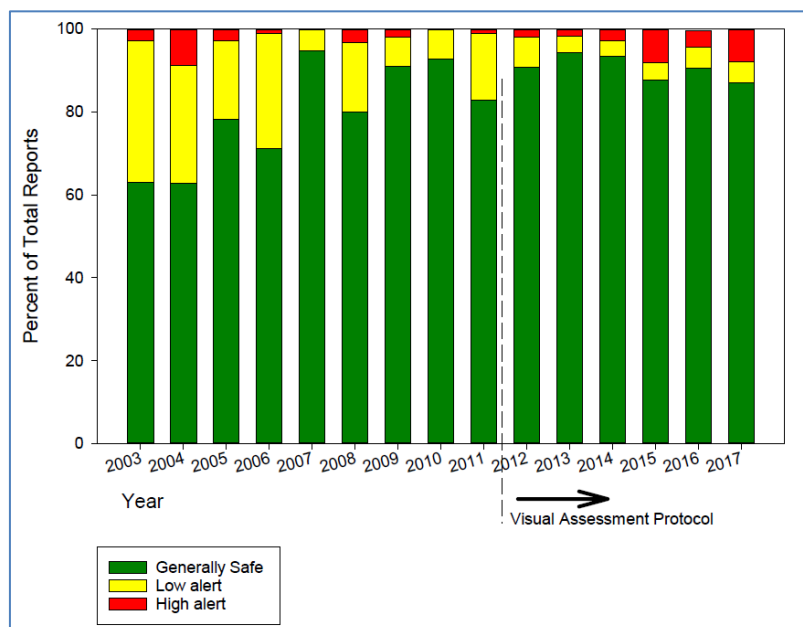


Figure 2. Cyanobacteria status reports Lake Champlain by category, percent of total reports received. Records prior to 2012 were determined using historical cell count and toxin data. Beginning in 2012, summaries include records obtained using the visual assessment protocol. The status generated by the visual assessment protocol is used at locations where both types of assessment were employed. Supplemental reports are included but not reported separately. (Table courtesy of Angela Shambaugh, VT DEC.)

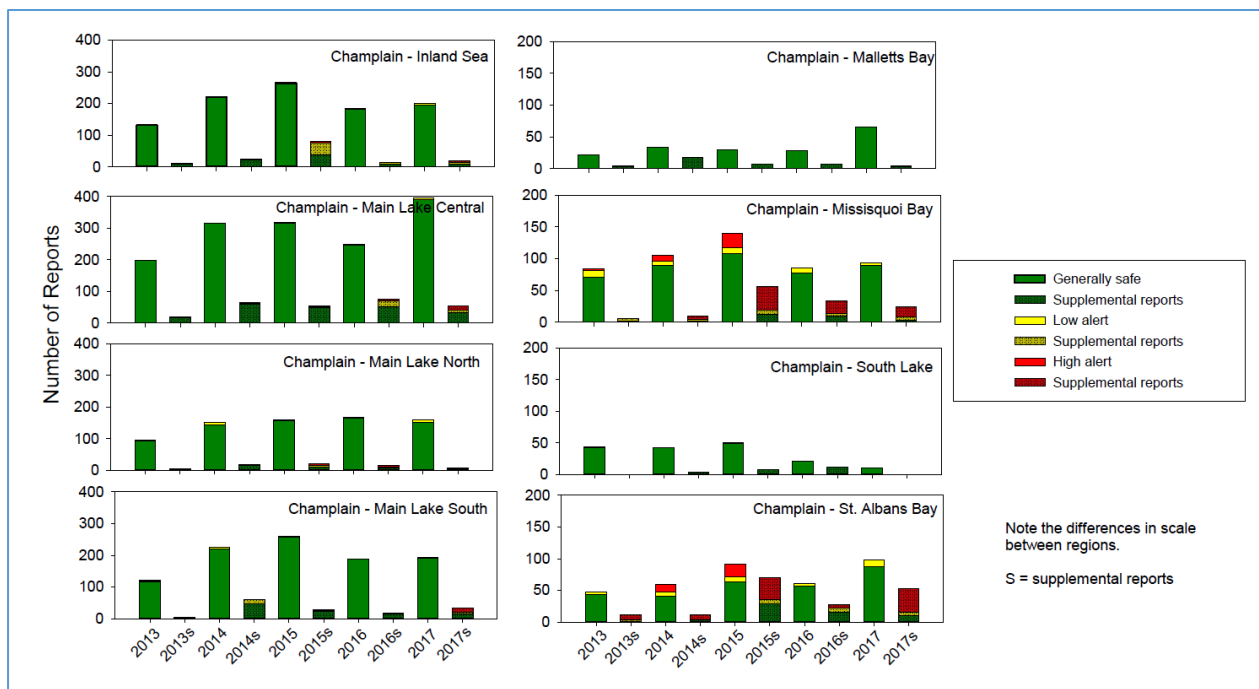
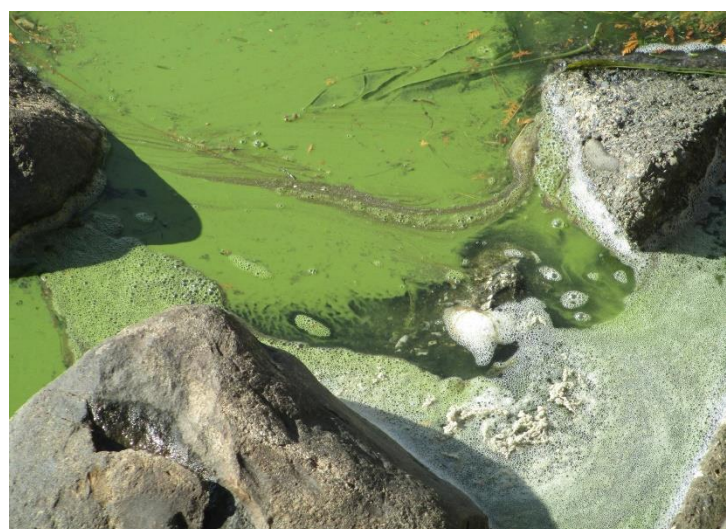


Figure 3. Number of yearly cyanobacteria reports for Lake Champlain by region, 2013 – 2016. The status generated by the visual assessment protocol is used at locations where both types of assessment were employed. Supplemental reports are included separately, indicated by an 'sr' preceding the year on the x axis. (Table courtesy of Angela Shambaugh, VT DEC.)

In late September, there were numerous alert level conditions reported along the Vermont shoreline from Burlington Bay southward. The warm weather also brought beachgoers out in high numbers during a time of year when park and beach staffing levels are typically low. LCC staff checked on beaches throughout Chittenden County to support municipalities who no longer had staff on-site and we called on several monitors to make additional site visits to public beaches in their area. Municipal staff also increased efforts to ensure coverage and LCC staff spent time talking to beach goers, educating them about cyanobacteria and the potential consequences of contact with cyanobacteria blooms. Town Health Officers posted signage at locations outside of Burlington.

As noted above, Lake Carmi, was severely impacted by blooms during 2017. The lake is eutrophic and experiences low oxygen concentrations in the hypolimnion, which results in internal phosphorus loading. LCC oversaw volunteer monitoring sites at four locations there and Vermont Department of Environmental Conservation (VT DEC) conducted routine water quality monitoring on Carmi in 2017. Blooms, primarily at the northern end of the lake, developed in mid-July for a short period and then subsided. In late August, water temperature dropped



High alert bloom conditions at Lake Carmi's Dewing Road site on November 8, 2017.
Photo by Dick Benton.

significantly, triggering early lake turnover and full mixing of the phosphorus-rich hypolimnetic waters into the rest of the lake. September's higher than normal temperatures along with intense sunshine and calm winds in re-established stratification with much higher phosphorus concentrations at the surface, which primed conditions for late season cyanobacteria blooms. These were severe and persisted into early November. Further details about 2017 water quality conditions for Lake Carmi can be found in the VT DEC summer 2017 Cyanobacteria Monitoring Report and on the [Vermont DEC webpage](#).

5 Conclusions

The LCC Citizen Cyanobacteria Monitoring Program continues to show that volunteer monitors can provide valuable information about the presence of cyanobacteria blooms. Priority locations for our monitoring sites include public beaches, locations where blooms have previously been observed, and public drinking water intakes. We continue to refine our outreach to increase the availability of the data and relay it to public health officials, recreational personnel, and interested citizens in a timely manner. Data collected by the volunteers were uploaded onto the Vermont Department of Health's on-line [Cyanobacteria Tracker Map](#) for tracking blooms generally within hours of receipt and vetting. The vast majority of the data provided on Lake Champlain conditions were provided by LCC staff or volunteers. Without LCC's volunteer cyanobacteria monitoring program the status and prevalence of cyanobacteria on the lake would be considerably less clear. The program provides useful information on conditions at near-shore areas and effectively involves citizens in a critical issue they are concerned about. It also is well integrated with state agencies. We coordinate with Vermont and New York environmental and public health agencies on protocols, messaging, public outreach, and publicity.

The monitoring program has an educational value that transcends the information supplied by the monitors. Nearly 300 people were trained to assess water conditions. Many people attended the trainings to educate themselves about cyanobacteria and to be able to assess conditions on their own. All involved became more knowledgeable about cyanobacteria and the potential risks they pose as well as the actions to take to reduce bloom frequency. Everyone who attended a training session left able to communicate this information with friends and neighbours. Monitors have noted that they share information with their neighbours and take personal actions to reduce blooms.

The monitoring program continues to grow with more citizen monitors participating each year. Their involvement provides areal coverage and report frequencies which would be difficult to obtain without volunteer assistance. Additionally, the program provides an avenue for citizens concerned about water quality to play a role in assessing conditions and disseminating information. While several federal agencies are working to develop satellite monitoring for the Northeast, we anticipate that the volunteer monitors will continue to be a critical part of the program because of their ability to report with greater frequency regardless of weather conditions.

2018 Plans

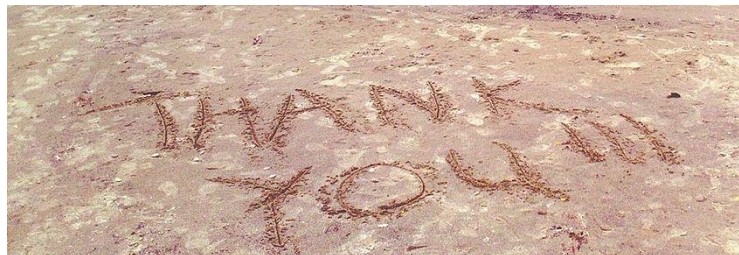
LCC is working to expand training materials for the upcoming season including an online training video. We will also be updating materials to include information about cyanobacteria that presented differently than some of our guidance documents such as the scytonema bloom that was discovered at the Coast Guard station in Burlington, VT for several weeks in September. Since the season of blooms is extending, with blooms showing up in the fall, we will also explore ways to cover high priority monitoring locations later in the year.

LCC will recruit broadly for the upcoming season. We will again hold training sessions throughout the watershed and coordinate with VT DEC and VDH partners on training, materials, reporting and outreach. We will also try to coordinate with New York agencies involved in the state's new Harmful Algal Bloom initiative. In addition to monitor training sessions we will also hold public information sessions on cyanobacteria to educate lake users on how to recognize and avoid blooms. Monitors and interested citizens will again be provided with weekly reports on conditions and we will do additional outreach through emailings, social media and other networks to inform people about conditions. We will continue to incorporate information about Act 86 (VT law passed in 2016 outlining VDH reporting requirements for cyanobacteria) into our training materials and collaborate with project partners on media outreach related to the reporting needs.

To facilitate timely reporting of conditions, LCC's ECO AmeriCorps Education & Outreach Coordinator will follow-up with monitors who aren't reporting regularly. He will also contact monitors who have reported blooms to facilitate daily reporting when possible through the duration of the bloom.

6 Acknowledgements

Funding for LCC's portion of the 2017 monitoring program was provided by the Lake Champlain Basin Program and private donations. We are deeply appreciative of this financial support.



We greatly appreciate the investment LCBP has made in the cyanobacteria monitoring program.

Photo by LCC.

The cyanobacteria monitoring program is an effective collaboration by state agencies and a bi-state nonprofit organization. Our sincere thanks to partners at the Lake Champlain Basin Program (LCBP), Vermont Department of Environmental Conservation (VT DEC), Vermont Department of Forests Parks and Recreation (VT FPR), Vermont Department of Health (VDH), Vermont Rural Water Association (VRWA) for their involvement. Thanks also to the dedicated work of Dom Brennan, Daniel Denora and Alexa Hachigian of LCC; Colleen Hickey, Eric Howe, Ellen Kujawa, Meg Modley, and Matt Vaughn of LCBP; Angela Shambaugh, Pete Stangel, and Heather Campbell of VT DEC; Rob Peterson of VT FPR; Lisa Cicchetti, David Grass, Kirk Kimball, Jan Leja, Bridget O'Brien, Marie Sawyer, Ben Truman, Sarah Vose, and Peter Young of VDH; Shaun Fielder and Liz Royer of

VRWA for their collective efforts and partnership. Finally, we gratefully acknowledge all the citizen volunteers who continue to be the backbone of the monitoring program.

7 [References](#)

Watzin, M., S. Fuller, L. Bronson, R. Gorney, and L. Schuster. 2011. Monitoring and Evaluation of Cyanobacteria in Lake Champlain, Summer 2009. Lake Champlain Basin Program Technical Report No. 61. 64 pp.

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8 [Appendices](#)

[Appendix A – 2017 LCC Citizen Monitoring Site Listings and Locations](#)

Waterbody	Region	Station <i>Sites in bold were new in the 2017 season</i>	Site #	Latitude	Longitude
Lake Carmi <i>4 sites</i>		Lake Carmi, Black Woods	164	44.97530	-72.88546
		Lake Carmi State Park South	165	44.95692	-72.87729
		Lake Carmi, Dewing Road	166	44.98214	-72.85354
		Lake Carmi, North Beach	167	44.99054	-72.87031
Lake Champlain	Champlain – Inland Sea <i>22 sites</i>	Grand Isle State Park	11	44.68602	-73.28912
		North Hero State Park	23	44.92175	-73.24078
		Pelots Bay	24	44.82537	-73.29915
		Burton Island	37	44.77686	-73.19632
		The Gut	49	44.75137	-73.29026
		Sand Bar State Park	57	44.62876	-73.23994
		City Bay - Rt 2	78	44.81589	-73.28908
		Knight Point State Park	80	44.76867	-73.29446
		South Hero Fish and Wildlife Boat Access	110	44.63641	-73.26523
		Marycrest Beach	116	44.72336	-73.28155
		Cedar Ledge	131	44.84695	-73.26219
		Keeler Bay East	134	44.65414	-73.29196
		Keeler Bay Boat Launch	135	44.66791	-73.31991
		Maquam Beach	139	44.92081	-73.16136
		Woods Island	145	44.80487	-73.20453
		Knight Island	146	44.81072	-73.25808
		Cohen Park	174	44.86489	-73.18236
		Van Everest Boat Launch Milton	175	44.70587	-73.21043
		South Alburgh - Squires Bay	182	44.90300	-73.27185

		Everest Road	185	44.64983	-73.21310
		Maquam Shore Road, Swanton	209	44.90310	-73.16770
		Alburgh VT - shoreline		44.92180	-73.25750
Lake Champlain	Champlain – Main Lake Central <i>35 sites</i>	Wilcox Dock, Plattsburgh	12	44.70887	-73.44538
		North Beach	22	44.49106	-73.24037
		Red Rocks Beach	27	44.44200	-73.22413
		Oakledge Park Blanchard Beach	42	44.45744	-73.22551
		Oakledge Park South Cove	43	44.45496	-73.23004
		Oakledge Park rocky shoreline	44	44.45671	-73.22803
		Shelburne Beach	48	44.36306	-73.26761
		Leddy Park	54	44.50083	-73.25341
		LaPlatte River Mouth	55	44.40034	-73.23345
		Buena Vista Park, Willsboro NY	61	44.40395	-73.37346
		Teddy Bear Point Cove, Willsboro NY	63	44.44272	-73.37428
		Willsboro Boat Launch	68	44.39945	-73.39155
		Burlington, VT - Texaco Beach	72	44.48764	-73.23213
		Charlotte Town Beach	76	44.33473	-73.28290
		Community Sailing Center	107	44.48206	-73.22552
		Starr Farm Beach	108	44.51376	-73.27140
		White's Beach in Crescent Bay	114	44.62114	-73.32344
		Shelburne Farms	123	44.39440	-73.27750
		Sunset/Crescent Beach	132	44.60888	-73.31585
		Port Kent Beach	152	44.528651	-73.40347
		Peru Boat Launch	159	44.618838	-73.44043
		Boat Launch, Corlear Bay, Port Douglas NY	160	44.48612	-73.41174
		Allen Point	189	44.59928	-73.31143
		Beech Bay	190	44.63250	-73.34290
		Ausable Point	376	44.57213	-73.42657
		Big Brook Cover, Southern end	378	44.39267	-73.40530
		Hills Point	384	44.339163	-73.28181
		Burlington Inner Dock	381	44.482095	-73.22463
		Essex Road	382	44.001514	-73.40308
		Noblewood Park	390	44.343764	-73.35774
		North Shore Beach	391	44.520757	-73.26958
		Cliff Haven Camp	404	44.667337	-73.44219
		Colchester Point Boat Launch			
		Dead Creek Inlet		44.577824	-73.43754
		Delta Park	405	44.536704	-73.27749
	Champlain - Main Lake North <i>14 sites</i>	Carry Bay	5	44.83359	-73.28991
		Pt. Au Roche State Park Beach	26	44.77414	-73.39380
		Alburgh Dunes State Park	35	44.86462	-73.30196
		Oliver Bay	45	44.73745	-73.40234
		Treadwell Bay, Beekmantown NY	64	44.76008	-73.40752
		Pt. Au Roche S.P. Deep Bay	84	44.77751	142
		Pt. Au Roche Boat Launch	109	44.80440	-73.36297
		Vantines Boat Launch	115	44.71981	-73.34189
		Horicans Fish and Wildlife	127	44.91408	-73.31449

Lake Champlain		Access			
		Stoney Point, Isle la Motte	128	44.87148	-73.35944
		Holcomb Boat Launch	129	44.85468	-73.33162
		Pelots Point West	130	44.82608	-73.31012
		Mud Point	389	44.93350	-73.31330
		RPt DEC Old Beach	395	44.99910	-73.35784
	Champlain - Main Lake South 24 sites	Arnold Bay	3	44.14974	-73.36947
		Kingsland Bay State Park	15	44.24030	-73.29873
		Long Point	18	44.25813	-73.27764
		DAR State Park	39	44.05453	-73.41825
		Beggs Park Beach, Essex NY	60	44.30846	-73.34732
		Niquette Bay State Park	67	44.58129	-73.18889
		Button Bay Boat Launch	74	44.17616	-73.35225
		Camp Dudley, Westport NY	75	44.14322	-73.41567
		Hawkins Bay	105	44.24376	-73.28336
		Rosetti Park	111	44.55501	-73.25280
		Ferrisburgh Town Beach	117	44.23594	-73.30098
		Town Farm Bay	119	44.26916	-73.28875
		Ferrisburgh Stone Beach	137	44.23790	-73.30828
		Malletts Bay Boat Launch	120	44.55416	-73.23100
		Bulwagga Bay/Port Henry	138	44.03688	-73.45475
		Camp Kiniya	142	44.60644	-73.22908
		Summer Point	148	44.21825	-73.33801
		Panton Shore North	151	44.15354	-73.36426
		Port Henry Public Beach	153	44.05278	-73.45059
		Button Bay State Park	180	44.18093	-73.36176
		Button Bay South	183	44.03687	-73.454750
		Converse Bay	184	44.29396	-73.28979
		Tri-Town Road, West Addison	210	44.08538	-73.40791
		Burgey Farm Road	380	44.05594	-73.41717
	Champlain – Malletts Bay 4 sites	Niquette Bay State Park	67	44.58129	-73.18889
		Rosetti Park	111	44.55500	-73.25279
		Camp Kiniya	142	44.60644	-73.22907
		Bayside Beach	377	44.54565	-73.21594
	Champlain - Missisquoi Bay 9 sites	Chapman Bay	6	45.00784	-73.21121
		Donaldson Point	10	44.99320	-73.17530
		Shipyard, Highgate Springs	30	44.98075	-73.107881
		Philipsburg, QC	58	45.03906	-73.07869
		Larry Greene Fish & Wildlife Access Area	87	44.96796	73.22111
		Country Club Road	172	44.99619	-73.09300
		Rock River	178	44.98929	-73.08894
		Alburgh Springs	208	44.99135	-73.21595
		Venise-en-Quebec	399	45.06441	-73.37015
		St. Albans Bay Park	31	44.80866	-73.14436
	Champlain – St. Albans Bay 9 sites	St. Albans Boat Launch	32	44.79372	-73.17143
		Kill Kare State Park	56	44.77770	-73.18080
		Ferrand Rd. St. Albans	113	44.79171	-73.14254
		Melville Landing	176	44.76174	-73.16764
		Black Bridge	191	44.81030	-73.15180
		Georgia Beach	193	44.76742	73.16264
		Hacketts Way	402	44.784388	-73.17396
		Hathaway Pt. Rd.	403	44.79636	-73.16312
Lake Iroquois 2 sites		Lake Iroquois Southwest	169	44.36327	-73.08564
		Lake Iroquois	203	44.37807	-73.08674

Lake Memphremagog <i>4 sites</i>		Prouty Beach, Newport VT	204	44.94501	-72.20998
		Derby Bay	211	44.99438	-72.18835
		Holbrook Bay	212	44.96392	-72.23968
		Newport City Dock	342	44.93706	-72.212069
Shelburne Pond <i>1 site</i>		Shelburne Pond Boat Launch	396	44.37720	-73.16209

Appendix B - LCC Reporting & Visual Assessment Protocols & Guidance

B.1 – Introduction to Cyanobacteria Information

<https://www.lakechamplaincommittee.org/lcc-at-work/algae-in-lake/#c1837>

B.2 – LCC Online Reporting Form

<https://www.lakechamplaincommittee.org/get-involved/volunteers/cyanobacteriamonitors/cyanobacteria-monitor-reporting-form/>

B.3 – LCC Online Instructions for Categorizing Bloom Intensity

<https://www.lakechamplaincommittee.org/get-involved/volunteers/cyanobacteriamonitors/algae-bloom-intensity/>

B.4 – Instructions for Photographs & Taking Water Samples

<https://www.lakechamplaincommittee.org/get-involved/volunteers/cyanobacteriamonitors/bga-photos/>

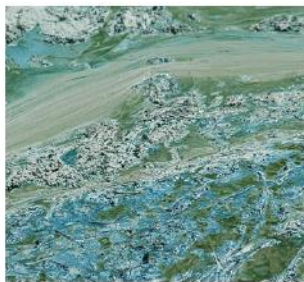
Appendix C – Downloadable Flier on How to Recognize Cyanobacteria

CYANOBACTERIA



May Watan

Cyanobacteria often start as small clumps. Cyanobacteria blooms often begin as small, rounded or fuzzy clumps of green in the water (above). As the bloom intensifies, the clumps come together coating the water surface. At this point the blooms may resemble pea soup. In areas with very high densities, or where the cyanobacteria have washed ashore, there may be a paint-like sheen (below) in hues of green, blue or turquoise.



Ron Hudeg

Cyanobacteria along the shoreline often have an oily-looking sheen.

REPORT YOUR SIGHTINGS

If you see a suspected cyanobacteria bloom, please report it to the Lake Champlain Committee via our online form or call us at (802) 658-1414. Your information will help further understanding of Lake Champlain water conditions. Remember to avoid direct contact with blooms themselves, as it is not possible to visually determine if they contain toxins.

BECOME A MONITOR

Contact LCC at the address below to become a summer cyanobacteria monitor or attend a training session to learn more about cyanobacteria.

FOR MORE INFORMATION

During the summer months cyanobacteria monitoring reports from LCC and the Vermont Department of Environmental Conservation are compiled on a **cyanobacteria tracker map** hosted on the Vermont Department of Health's website. You'll find further information about cyanobacteria there and on the Lake Champlain Committee's website.

The **Lake Champlain Committee** is a membership-supported, bi-state nonprofit organization working since 1963 to protect Lake Champlain's health and accessibility through science-based advocacy, education and collaborative action. We welcome your involvement!



Lake Champlain Committee

208 Flynn Avenue, Bldg. 3, Studio 3F
Burlington, VT 05401

(802) 658-1414 ~ lcc@lakechamplaincommittee.org
www.lakechamplaincommittee.org

Printed on non-chlorine bleach recycled paper in the interest of clean water!

RECOGNIZING CYANOBACTERIA IN LAKE CHAMPLAIN



May Watan

Cyanobacteria washed up along shoreline.

Cyanobacteria blooms pose a health concern because of their potential to produce toxins. Not all blooms are cyanobacteria and not all cyanobacteria blooms are toxic.

This flyer is a visual guide to help people distinguish cyanobacteria from various types of floating phenomena that are often mistaken for it. The key should not be relied upon to determine whether or not a cyanobacteria bloom contains toxins, that can only be determined through lab analysis of a water sample.

Since 2003, the **Lake Champlain Committee (LCC)** has trained citizen volunteers to monitor for cyanobacteria at lakeshore locations. Monitors file weekly online reports that are relayed to local and state agencies and published on the VT Dept. of Health website and accessible to anyone with internet access. The program helps health, environmental and recreational officials assess the safety of our beaches. It also provides important data to help reduce the frequency of blooms.

FLOATING PHENOMENA THAT AREN'T CYANOBACTERIA BLOOMS

DUCKWEED



John Cress

Duckweed, a plant unrelated to cyanobacteria, looks similar when it proliferates and washes ashore, but you should be able to note that each speck is an individual flattened floating leaf, while cyanobacteria have no leaves. There are a number of different species of duckweed, all in the family *Lemnaceae*. Duckweed is most common in sheltered bays and inlets.

GREEN ALGAE



Green Lakes Water Institute

Lake Champlain also experiences blooms of non-toxic green algae such as *Cladophora*. This species grows attached to rocks and breaks off in clumps that may appear brown or green and stringy. *Cladophora* do not form paint-like oily slicks. Other examples of algae that are not cyanobacteria may look like long green hairs, green clumps, yellowish clouds, or gelatinous brown balls.

POLLEN



Melanie Watan

Accumulations of pollen from pine and other trees may also appear like cyanobacteria. Pollen forms a film on the water, but unlike green algae and cyanobacteria, it is yellowish and will feel coarse to the touch rather than slimy. When pollen is abundant it will coat items on land as well as in the water. Pollen most often accumulates in spring and early summer.

Appendix D – Example of Weekly Reports to Monitors

8/12/17 LCC Email to All Monitors – Week 8 Results & Monitor Guidance

Note: Throughout the season monitors received a weekly personalized email with instructions and information for reporting, resources and links to guide their water assessments, along with background on the monitoring program, funding and partners. As the season moved on, we also included results from the weekly reports, teachable moments from conditions observed, and further guidance to address any reporting issues. This way monitors always had ready access to their site numbers, names, lake region, and any passwords or user names in order to file timely reports. Additionally, the weekly emails let them know who was on call for the weekend and provided other useful information to both aid their reporting and help them educate others about cyanobacteria. (Because the email was constructed in MailChimp, not all the content is viewable in this report. Contact LCC if you'd like to receive the original via email.)

From: Lori Fisher <Lorif=lakechamplaincommittee.org@mail215.atl81.rsgsv.net> **On Behalf Of** Lori Fisher

Sent: Saturday, August 12, 2017 8:41 AM

To: Lori <lorif@lakechamplaincommittee.org>

Subject: LCC Week 8 Cyano. Mon. Reports & Monitor Guidance

To ensure you receive email from LCC,
please add lcc@lakechamplaincommittee.org and
lorif@lakechamplaincommittee.org to your safe/allowed list.

[View this email in your browser](#)



Dear Karen,

This week there were mixed conditions reported on Lake Champlain but only one report of a bloom at Vermont inland lakes (low alert at Ticklenaked Pond). While blooms witnessed on Lake Champlain were restricted to Missisquoi Bay (one location), St. Albans Bay (four sites), Inland Sea (two sites) and the northern part of the lake (one location), we are in the middle of what is generally the peak bloom period for our region. Too many nutrients have flowed in during the wet spring and summer and more rain is expected this weekend. This will continue to fuel nutrient growth so please remind everyone recreating on or near the water to learn to recognize and avoid contact with blooms. [Here's a link to a video that the monitoring partners collaborated on that can help people identify cyanobacteria.](#) Please share it.

[Lake Champlain Committee](#) (LCC) cyanobacteria monitors filed 122 reports this week with 99 regular, 13 supplementals, seven from research or long-term monitoring stations and three from Army Corps of Engineer locations. Thanks to everyone who has been diligently reporting and spreading the word about conditions. A special shout out to Brad Gooding and Cathy Hickory who have been doing daily reporting this week and who joined Dom and me at St. Albans Bay to help brief federal Senate staff about the monitoring program.

Reports you filed this week should be visible on the VT Dept. of Health (VDH) [Cyanobacteria data tracker](#). VDH has not been able to resolve the tracker map software issues so all the site markers on the VDH data tracker continue to show in lavender instead of the usual green, yellow or red coding. The most current reports and conditions can still be accessed through the spreadsheet table to the right of the data tracker map. You can either click on a dot to zoom in to a location and see the most recent reporting results in the table or select for a location by town using the drop down menu at the top of the page.

Below you'll find results of this week's reporting, instructions and links for filing your information directly to the VDH online tracking system, along with your user name, password, site number(s), site name(s), and lake region(s) for the data entry if they've been assigned to you. If you don't have a site number and/or your site name does not appear in the drop down menu of the reporting form, you will need to file a supplemental report. If your site name is not showing up in the drop down menu please note that in the "Additional details" field with your site name.

As always, we've included [very detailed instructions for reporting using the VDH report form](#) along with monitor protocols, guidance materials to aid in assessing conditions and background information about the program. Please use the information in this email to help you file accurate, timely reports. We'll continue to send you a weekly compilation of monitor reports along with your username and passwords and useful links to assist with your reporting. If you have any questions, please call (802 658-1414) or email us (lcc@lakechamplaincommittee.org). Thanks for all you do!

Warmly,



Lori Fisher, LCC Executive Director
Lake Champlain Committee

WEEK OF AUGUST 6 CYANOBACTERIA MONITORING RESULTS

The information below represents the results from the latest reporting through Saturday morning August 12, 2017. If you witness bloom conditions on any waterbody or have reported low or high alert conditions any time this week, please continue to assess the water and report daily through the time the bloom has dissipated. Check the [data tracker](#) for the most up to date conditions and let us know if you don't see your recent filings. David Grass of the VDH will be "on call" this weekend reviewing reports as they come in and updating the data tracker. If you need to reach him, the best approach is to email bloomalert@vermont.gov.

Lake Champlain Monitoring Sites (105 reports)

Missisquoi Bay – 7 reports - Mixed conditions reported this week. High alert bloom conditions were reported from Place de Quai in Phillipsburg, Quebec on August 7. We have no additional reports from this site so conditions may have changed. No other blooms were reported at other locations in the bay this week. While all the other site monitors reported clear water, conditions can change rapidly. Anyone recreating in the bay should watch for, avoid and report blooms.

St. Albans Bay – 17 reports – Mixed conditions were reported throughout the week. A low alert bloom was reported at Long-term Monitoring (LTM) Site #40 just north of Lazy Lady Island on August 9. LTM sites are research locations that are monitored every two weeks so conditions may change before they are assessed again and show on the data tracker. A bloom started at St. Albans Town Bay Park mid-afternoon on August 10 and persists through Friday and the beach remains closed. While water sample tests have come back negative for microcystin, the beach will stay closed and remain on high alert while cyanobacteria is observed in the water. High alert bloom conditions were also observed at Black Bridge access area on August 10 and continue through August 11. A low alert bloom was observed at St. Albans' Cohen Park on the afternoon of August 10. The 11 other locations were showing safe conditions. Anyone recreating in the bay area should be mindful of changing conditions and watch for, avoid and report blooms.

Inland Sea – 16 reports – Mixed conditions were reported this week with a low alert at North Hero's Pelots Bay on August 8 and at Marycrest Beach in Grand Isle on August 10. The 14 other reports from the Inland Sea showed generally safe conditions but anyone recreating in this area should be mindful of changing conditions and watch for, avoid and report any blooms.

Malletts Bay – 5 reports – all generally safe conditions; no blooms reported.

Main Lake North – 11 reports – A low alert was called in by a citizen for Alburgh Passage on August 8 but they were not able to file any follow-up reports. The ten other site reports all

indicated generally safe conditions. Anyone recreating in this area should be mindful of changing conditions and watch for, avoid and report any cyanobacteria.

Main Lake Central – 33 reports – all generally safe conditions, mainly showing clear water; no blooms reported.

Main Lake South – 16 reports – all generally safe conditions, mainly showing clear water; no blooms reported.

South Lake – 1 report – generally safe conditions; no blooms reported.

Other VT Lakes (13 reports in addition to Army Corps reporting)

Lake Carmi – 5 reports – no bloom sightings, generally safe conditions.

Lake Iroquois – 1 report – no bloom sightings, generally safe conditions.

Lake Memphremagog – 4 reports – no bloom sightings, generally safe conditions.

Lake Morey – 1 report – no bloom sightings, generally safe conditions.

North Hartland Lake – Army Corps of Engineers reported no bloom sightings, generally safe conditions.

Shelburne Pond – 1 report - no bloom sightings, generally safe conditions.

Stoughton Pond – Army Corps of Engineers reported no bloom sightings, generally safe conditions.

Tickelnaked Pond – 1 report - low alert conditions observed at the north end beach. Anyone recreating in these areas should watch for and avoid blooms.

Townshend Lake – Army Corps of Engineers reported no bloom sightings, generally safe conditions.

Vermont Drinking Water Facilities Report

For the third summer in a row, the VT Dept. of Health and VT Dept. of Env. Conservation are collaborating to conduct cyanotoxin analysis of raw and finished water for the 22 Lake Champlain-sourced water systems. The 12 weeks of testing is funded by the Lake

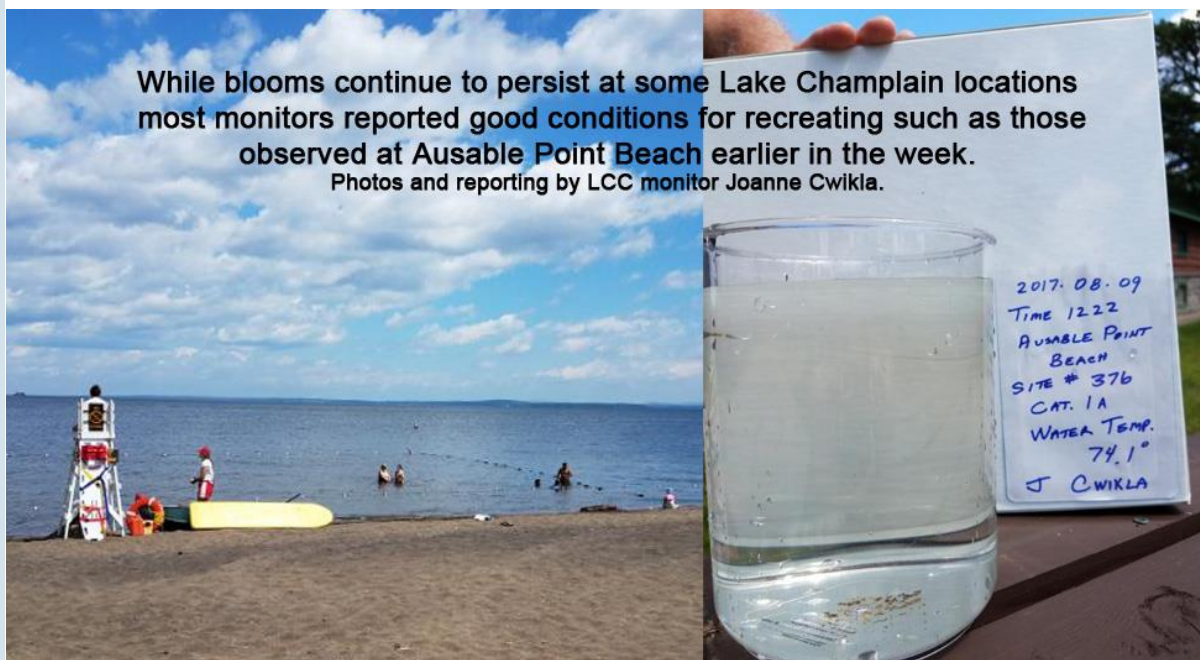
Champlain Basin Program. The tests began in mid-July and will continue through September. [Click here](#) to view results from this week's testing at Vermont Drinking Water Facilities and for a compilation of results from the last few weeks and recent years.

New York Lake Champlain Beaches

No reports of closures this week. Check with beach authorities for current conditions.

New York Inland Lakes

Cyanobacteria blooms and beach closures have been reported for some inland New York lakes. For more information and to sign up for weekly notifications of harmful algal blooms in New York, visit the [New York Harmful Algae Blooms Notification Page](#). The site is generally updated at least weekly.



PASSWORDS & LINKS FOR YOUR REPORTING

Use the information below to enter your cyanobacteria reports for this and subsequent weeks on the [Vermont Department of Health online reporting form](#):

User Name: KarenQuimby (no space between your first and last name)

Password: KQcTY3cMe7

The user name is not case sensitive, but the password is. If you are a couple, your user names and passwords will appear in sequence.

Your site number(s), site name(s), and lake region(s) are:

Site Name(s): Carleidge Park Blanchard Beach, Carleidge Park South Cove, Carleidge Park Rocky Shoreline

Lake Region(s): Main Lake North

If you have multiple sites, your numbers, names, and lake segments will appear in sequence. If you have any question about which number pertains to which site name, please contact LCC Field Associate/Office Manager Alexa Hachigian at 802 658 1414 or email her at lcc@lakechamplaincommittee.org.

If you haven't been given a site number for one or more of your sites choose "supplemental" for the type of report, enter "0" in the site number box and provide narrative detail about your location in the "additional details" box. (The VDH technical difficulties have delayed their abilities to provide new site numbers so thanks for your patience as they work to catch up.)

If you are a Lake Champlain Boat Steward your site number(s), name(s) and lake segments will vary depending on your weekly location. Please scroll to the end of this email for a table of site numbers and names to guide your reporting.

DATA ENTRY INSTRUCTIONS FOR USING THE VDH REPORTING FORM

Hardware & Browser Guidance

The VDH form has been tested on a variety of devices including Windows 7 desktop, Windows 10 laptop, Samsung Galaxy tablet, iPad. The mobile version is also working. Browsers that have been successfully tested are Chrome, Firefox, Safari, Edge (Windows 10), and Internet Explorer 11 (IE11). **They should all work, but IE is the most likely to experience problems.**

Entering Your Report Data

[Click here for a link to the VDH reporting form.](#)

<https://apps.health.vermont.gov/vttracking/cyanobacteria/2017/reporter.html>

A pop-up will appear in the center of the screen prompting you to sign in.

Use the username and password provided to you in the email from LCC. Type them in the appropriate fields. Click "OK".

The popup will disappear, you are now signed in and able to file a report. **If the pop up does not disappear, there may be a problem with your username and password. Double check that you have typed them in correctly by trying to sign in again. Remember that capital letters and punctuation matter.**

If it still does not work, use the [LCC online reporting form](#) to file your report and specify

where you outline problems you've experienced with the VDR form.

On the left side of the screen you will see words "Enter site #:" Enter your site number as provided above in the white text field. Click "Zoom to site."

If you do not have a site number, or are filing a supplemental report and do not know the site number:

Enter the town name instead by typing it into the white text field below "Enter a town name." Click "locate". The map will zoom into the town of interest. You can navigate the screen by clicking and dragging the page, or using the + and – buttons in the top left corner of the map to zoom in and out

You will need to include details on the location of this supplemental report in the "Additional Details" field. See information on filing a supplemental report below.

In a white box on the left side of the tracker, you will see the words "New Report." Click on the white box that says "New Report" so the box is highlighted in blue. Double check that you are viewing the correct site on the map. A crosshair symbol marks the established sites on the map. When you hover over the map, a bubble should appear next to the cursor reading "Click to add a point". Click the location on the map where your observation was made. For routine reports, it should be close to the crosshairs symbol on the map marking your site.

A popup window will appear when you click. Click on the small box symbol in the top right corner, to the left of the X, to enlarge the window.

All fields with a red asterisk are required. To fill in a field, click the dropdown arrow to the right of the field. A dropdown menu will appear, select the appropriate response by clicking on it. If you don't see the response you're looking for, try scrolling to view all the possible responses. If you still do not see the response you're looking for, select "other" by clicking on it. If you select other, clarify your location by typing the name or description of your location in "Additional Details". For each remaining field, use the dropdown menu to fill out the information needed.

If the site you monitored does not have a Site Number, leave this field blank, and file a supplemental report (see details below for filing a supplemental report).

A calendar will appear when you view the dropdown menu for "Report Date". Choose the correct date by clicking on it. The default date is the current date.

For "Report Time" it must be in 24-hour time, also known as Military Time. **(For example, 1:00pm should be reported as 13:00.)**

For assistance determining which category your bloom is in. Hit "Help" in parenthesis next to "Bloom Intensity".

Your "Affiliation" is LCC volunteer.

Attaching Photographs

For a Category 2 or 3 bloom or any time you have questions about what you are observing, attach three photos:

- A close-up of the bloom.
- A wide-angle photo of the bloom and surrounding land and water.
- A photo of the water sample in a glass jar, after it has sat in the sun for 30 minutes, with a white piece of paper behind the jar that includes the date, time, location, site number, category, and temperature if possible.

Scroll down to see "Attachments" and click "Browse". Select one of the photos from wherever you have saved it and upload it by selecting it and then hitting "open". Repeat this for the other photos. It's very helpful if you can save your photos titling them with the date-photographer's name-location-water category-and photo type.

Example file name: 2017-08-12_DavidMonitor_Best Bay_Category 3 Bloom Close-up

Additional Details

Under "Additional Details" describe anything that may be unclear if someone looked at the photos without having visited the site. Let us know the extent of the bloom and anything else that might be helpful in assessing your report. **Also note the day of the week that you generally plan to report on in the "Additional Details" section.**

Check Your Work Before Submitting

Before you click "Submit" **check all the information** you provided to make sure it is correct. Click "Submit" once you are confident that you have filled every field accurately.

Another popup window will confirm that you have submitted a report. You may be contacted by a moderator from LCC or our partners at VDH and the VT Dept. of Env. Conservation (VT DEC) with questions. The more details you provide, the less likely you are to be contacted. [Click here for the Cyanobacteria Public Tracker Map](#). Your report will appear on the map once it is vetted.

If you monitor multiple sites you can navigate to any additional sites by clicking and dragging on the map or by entering site numbers. **You do not need to log in separately for each**

approximate name and make a note in the **Additional Details** box so VDH can update the tracker.

Filing a Supplemental Report

File ***supplemental report(s) if your site does not have a number or you are not reporting at your normal day, time, and location.***

To file a supplemental report, for "Report Type" select "supplemental".

For supplemental reports, you must provide more information in the "Additional Details" box. If you are reporting at your regular site, type the word existing. If this is not your regularly monitored site, please write in the "Additional Details" box about where you are. Include the municipality you are in as well as details about the location of the specific site you are observing.

LCC Reporting Form

If you have trouble logging in or encounter any other problems you can submit your reports through the [Lake Champlain Committee's online reporting form](#). Please be sure to fill out the section of the form describing the specific problems you experienced with the cyanobacteria reporter website as this will help the Vermont Dept. of Health team improve the data entry system.

CYANOBACTERIA MONITORING PROTOCOLS

Timing of weekly reports

To ensure data quality, observations should be made between 10:00 AM and 3:00 PM and, to the extent possible, on the same day each week.

The 10:00 AM start time is because cyanobacteria can regulate their position within the water column. They will float towards the surface as the sun comes out and the water warms. Observations before 10:00 AM may not be capturing how much is there. The 3:00 PM cut-off time is more fluid. At some point cyanobacteria will sink back down in the water column so we want to get observations before the sun gets too low in the sky.

Let us know when you plan to report

If you haven't let us know which day of the week will generally be your reporting day, please provide that information in the "Additional Details" section of the VDH report form.

Reporting the same day of the week and the same time of day whenever possible, helps ensure the integrity of the data. **Please make your online report as soon as possible after observing conditions so that we can provide timely information. VT state law requires**

is a public health hazard. Your timely notice of water conditions can help keep everyone informed.

Reporting blooms

If you observe a bloom outside of your normal weekly reporting period, please report it right away but reference the report type as a "*supplemental*" report. Continue to make daily reports through the time the bloom has dissipated. This will help us keep people updated with timely information about conditions.

Daily reporting

If you are interested in providing daily reports, regardless of whether or not a bloom is occurring, please let us know. Daily observations provide further information on water conditions and how blooms develop and dissipate. If you're available to do daily monitoring, you will still submit a weekly online report for your site(s), but we will also email you an Excel spreadsheet for recording your daily observations. Whenever you observe bloom conditions outside of your weekly reporting, you should submit a supplemental online report as soon as you observe the bloom and then record those details in your Excel spreadsheet as well. (This helps us get the information out to health agencies and up on the **cyanobacteria data tracker map** promptly.) For non-bloom conditions, we will collect your daily reports mid-way and at the end of the season. **Please email us at lcc@lakechamplaincommittee.org to receive a spreadsheet for daily reporting. For those of you who have already contacted us, we anticipate emailing spreadsheets next week.**

WHAT HAPPENS TO THE DATA?

Your weekly information will be used to populate the [Lake Champlain cyanobacteria tracking map](#) housed at the Vermont Department of Health. Once your reports are vetted by LCC or our partners at VDH and the VT DEC they will show up on the tracker. You should be able to check the map throughout the season for data on the Lake Champlain sites as well as several inland lakes. The vast majority of information provided on the site comes through LCC's cyanobacteria monitoring program. It's a clear illustration of the critical role you and other "citizen scientist" monitors play in assessing lake conditions. Your weekly reports are also provided to public health, environmental, and recreation agencies and managers and interested citizens. [Please pass on this link](#) to anyone you think might be interested in receiving our weekly emails.

LINKS TO REPORTING TOOLS & INFO

- [VDH reporting form](#) (please use this form as your primary reporting tool as it is

reporting through the VDH form,

- [LCC reporting form](#)
- [LCC instructions for categorizing water conditions](#)
- [LCC instructions for photographing blooms and taking water samples](#)
- [LCC flier on how to differentiate blooms from other lake phenomena](#)
- [VDH Cyanobacteria Tracker Map](#)

GUIDANCE FOR TAKING PHOTOGRAPHS

[Please take digital photographs of the water](#) when [category 2 or 3 bloom conditions](#) are observed:

1. A close-up of the water surface
2. A broad view of water in the vicinity, and
3. A close-up of a water sample in a clear container placed against a background that provides contrast such as a white sheet of paper or a blank wall. Darker colors provide more contrast. Put a white piece of paper underneath your jar as well to screen out any background that might be confusing to the viewer.

All photographs should include the time, date, monitor name and location. This information can be added by holding a piece of paper with the relevant information in the picture. Name the photograph file using the year, month, day-photographer's name-location-photo type as shown below.

Example file name: 2017-08-13_Jane Doe_Bulwagga Bay_Category 2 Bloom Close-up

When collecting a water sample to photograph, take care to avoid exposure to cyanobacteria. Wear gloves, don't wade or immerse yourself in the water and wash any exposed portions of your body immediately after collecting the sample. Feel free to forego taking a physical sample for photography. If you see a bloom, avoid contact with water containing cyanobacteria and file a report right away.

SPREADING THE WORD

As monitors and partners in this program please help spread awareness about the risks of cyanobacteria and actions to take, particularly if you see people or pets recreating in bloom conditions. Your outreach builds a more informed and engaged citizenry. No one should be

from the lake and suspect a bloom near your intake, don't drink, cook, wash dishes or shower with the water. Boiling water doesn't destroy toxins.

Blooms are caused by a combination of warm water temperatures and high concentrations of nutrients in the water, particularly phosphorus. Reducing the supply of phosphorus is key to reducing blooms. So please continue to take [actions around your home and workplace](#) and advocate for stringent controls to reduce nutrients flowing into the lake.

BACKGROUND ON LCC's MONITORING PROGRAM

The Lake Champlain Committee (LCC) developed a cyanobacteria monitoring program for Lake Champlain in 2003/2004 and has overseen the citizen-based program ever since. The focus of the program is to raise awareness of the issue, build a database of information on bloom frequency, and identify and publicize any potential health hazards. The information gathered will help us better understand the triggers for blooms and aid in the work to reduce their frequency.

LCC coordinates our monitoring program closely with Vermont and New York health, environmental and recreation agencies. We annually train hundreds of citizens in methods to assess and report on water conditions. We also conduct trainings for state and municipal park staff, town health officers, and public water supply operators. LCC monitors provide important data on lake health from more than 100 Lake Champlain and inland lake locations.

FUNDERS & PARTNERS

The Lake Champlain Committee's cyanobacteria monitoring program is funded by [LCC members](#) and the Lake Champlain Basin Program. Key program partners include the Vermont Department of Environmental Conservation, Vermont Department of Forests, Parks, and Recreation, Vermont Department of Health, New York Department of Environmental Conservation, New York Department of Health, and the Lake Champlain Basin Program.

TABLE FOR BOAT LAUNCH STEWARD REPORTING

Site #	Site Name	Lake Segment
12	Wilcox Dock, Plattsburgh	Champlain - Main Lake Central
32	St. Albans Boat Launch	Champlain - St. Albans Bay
55	LaPlatte River mouth, Shelburne Bay	Champlain - Main Lake Central

110	South Hero Fish and Wildlife Boat Access	Champlain - Inland Sea
120	Mallets Bay Boat Launch	Champlain - Mallets Bay
150	Plattsburgh Boat Launch	Champlain - Main Lake Central
159	Peru Boat Launch	Champlain - Main Lake Central
184	Converse Bay Boat Launch	Champlain - Main Lake South
0	Colchester Point Fishing Access Area	Champlain - Main Lake Central



[LCC's Facebook Page](#)



[LCC's Website](#)



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Appendix E – Example of Weekly Reports to Interested Citizens/Agencies

9/30/17 LCC Email to Interested Citizens & Partners –

Week 15 Cyanobacteria Report & Lake Party Invite

Note: We compiled a list of citizens and partners who wanted to receive our weekly cyanobacteria reports. We advertised this option to all LCC members through mailings, emailings and social media posts. We also promoted it through the media, outlets like Front Porch Forum and through a wide variety of public outreach programs including presentations and tabling events. We promoted the email list serve throughout the season and continued to expand the list-serve.

Recipients received a personalized email each week which provided:

- *an overview of conditions,*
- *details of the weekly reports by lake section or inland lake,*
- *information about and links to the data tracker map and resources housed on the VT Dept. of Health website,*
- *links to resources to learn more about cyanobacteria and report on conditions,*
- *guidance on what to do if they observe a bloom,*
- *information on how the data is utilized,*
- *how to spread the word,*
- *background on the citizen monitoring program, and*
- *funding and partners*

We used the intro letter and pictures to share information about conditions observed that week and to further educate recipients about cyanobacteria. (Because the email was constructed in MailChimp, not all the content is viewable in this report. Contact LCC if you'd like to receive the original via email.)

From: Lori Fisher

Sent: Saturday, September 30, 2017 7:32 PM

To: LCC Email List of Interested Citizens & Partners

Subject: Lake Champlain Committee Final 2017 Weekly Cyano. Mon. Report & AM Invitation

To ensure you receive email from LCC,
please add lcc@lakechamplaincommittee.org and
lorif@lakechamplaincommittee.org to your safe/allowed list.

[View this email in your browser](#)



Record setting heat helped trigger cyanobacteria blooms at more than 20 Lake Champlain sites earlier in the week. Blooms were observed from Addison, VT (left photo by LCC monitor Cynthia Stacey) in the south to Philipsburg, Quebec in the north (right photo by LCC monitor Nathalie Fortin).

Dear Lori,

Below is our last weekly report for the 2017 cyanobacteria monitoring season. From September 24 through mid-week, a record-setting heat wave helped spawn or perpetuate blooms at over 20 monitoring sites along the Lake Champlain shoreline. The wet spring and summer had already flushed lots of nutrients into our waterways priming conditions for cyanobacteria to take off during the spate of hot, still weather. Additionally, we observed a genus of cyanobacteria in the area of the Burlington Coast Guard ramp that presents differently than other cyanobacteria (scroll down for pictures and more information about *Scytonema*).

Volunteers and partners turned out in force to respond to the blooms, filing reports, putting up signs, and educating people about cyanobacteria. LCC staff fanned out at various beaches along the lake to assess conditions and inform beach goers about cyanobacteria blooms. Many LCC monitors visited sites multiple times during the week. We're grateful for all the dedicated volunteers, state and provincial agency partners, water facility operators, parks and recreation staff, and the Lake Champlain Basin Program for the ongoing efforts that makes this cyanobacteria monitoring program work. If you'd like to be part of the team next year, or want to take the training to learn how to identify cyanobacteria, please [sign up here](#).

Cyanobacteria blooms are still present in areas of Lake Champlain and some inland lakes. Anyone on the water or shoreline should watch for changing conditions and avoid contact with scums, mats or blooms. While the formal reporting season is ending, LCC will continue to update the [blue-green algae tracker](#) with any bloom reports we receive in the off-season. If you think you see a bloom, please file a report using the [Lake Champlain Committee's online reporting form](#).

Please join us on *Thursday October 12* for our annual lake party! We'll gather from 6:00 - 8:00 PM at the Flynndog Gallery and Chef's Corners South End at 208 Flynn Avenue in Burlington's south end. There will be a guest address by Dr. Danielle Garneau on Microplastics in Lake Champlain, light fare of locally sourced food and drink (including great beer from our friends at Magic Hat), cool art in the gallery, and conversation with other lake lovers. [Click here for more information and to register](#). [RSVP by 10/3/17](#) to be entered into our pool of great prizes including a Keurig coffee maker, Happy lights, gourmet chocolates, gift certificates, LCC's natural history book and more cool items.

Thanks for caring for the health of our waterways. We hope you will stay involved with lake issues as the weather and water turn cooler. Your testimony at hearings, letters to policy makers, and discussions with family and friends can have a meaningful impact. Please let your legislators know you want them to make financial and resource investments to protect and restore water quality.

Hope to see you soon,



Lori Fisher, LCC Executive Director

WEEK OF SEPTEMBER 24 CYANOBACTERIA MONITORING RESULTS

The information below represents reporting through mid-day Saturday, September 30, 2017.

Lake Champlain Monitoring Sites (130 reports)

Missisquoi Bay – 6 reports - Mixed conditions were reported again this week. High alert bloom conditions have continued at Philipsburg Quebec and have also been reported, as of September 26, at the mouth of the Pike River. Locations on the Vermont side of the bay were reporting good conditions. Conditions can change rapidly so anyone recreating in the bay should watch for, avoid and report blooms.

St. Albans Bay – 18 reports – Mixed conditions this week. High alert conditions were reported from several areas on September 25. Some areas have cleared, but everyone in this area should watch for and avoid contact with the water for at least 24 hours after blooms dissipate.

Inland Sea – 6 reports – Mixed conditions were reported this week. Alert conditions were reported from the Maquam shore earlier in the week. Other locations reported generally safe conditions without blooms. Conditions can change rapidly so anyone recreating in this section of the lake should watch for, report and avoid blooms.

Malletts Bay – 7 reports – Mixed conditions this week. Low alert conditions were reported at the mouth of the bay on September 25. Other locations reported good conditions. Anyone in the bay should watch for, avoid and report blooms.

Main Lake North – 13 reports – Mixed conditions this week. Low alert conditions were reported from the Deep Bay at Pt Au Roche State Park in NY on September 25. All other sites reported generally safe conditions. Conditions can change readily so anyone recreating in this section of the lake should watch for, report on and avoid blooms.

Main Lake Central – 50 reports – Mixed conditions this week. High alert conditions were reported from many locations along the eastern shore this week. Beaches were closed in Shelburne, South Burlington, and Burlington. Burlington Parks and Rec. staff worked with the Vermont Dept. of Health staff to use and verify Abraxis microcystin test strip results for monitoring several beach areas. This looks to be a useful tool in recreational settings and their use may be expanded next year. Conditions can change rapidly so anyone recreating in this section of the lake should watch for, report on and avoid blooms.

Main Lake South – 26 reports – Mixed conditions this week. High alert conditions were reported from several areas including the Charlotte Beach. Everyone should watch for, avoid and report cyanobacteria.

South Lake – 4 reports - all generally safe conditions; no blooms reported.

Other VT Lakes (16 reports)

Chittenden Reservoir – 1 report - VT Dept. of Environmental Conservation received a report of particulate matter in the water and confirmed that small amounts of cyanobacteria are present in some areas of the reservoir but not at bloom levels. While the area is considered generally safe, conditions should be watched carefully.

Lake Carmi – 5 reports – Lake Carmi continues to experience an intense bloom that has persisted for multiple weeks. High alert bloom conditions persisted for a fifth week for most of the lake. Everyone should stay away from the water while blooms persist and avoid contact with the water for at least 24 hours after blooms dissipate.

Lake Iroquois – 5 report – Mixed conditions reported this week. High alert conditions were reported from the southwestern areas of the lake on September 25. Conditions have since cleared but anyone recreating in the area should watch for, report and avoid blooms.

Lake Memphremagog – 3 reports – no bloom sightings, generally safe conditions.

Lake Morey – 1 report – Mixed conditions were reported. Low alert conditions were reported on September 25 from the northeastern area of the lake. There has been no follow-up reporting so far; conditions can change rapidly so please watch for, avoid and report blooms.

North Hartland Reservoir – 0 reports – monitoring has ended for the season here, please be mindful of conditions and report and avoid any blooms if you recreate in this area.

Shelburne Pond – 1 report – High alert conditions were reported September 26 from the boat launch area. Anyone recreating on the pond should watch for, report and avoid blooms.

Stoughton Pond – 0 reports – monitoring has ended for the season on this lake, please be mindful of conditions and report and avoid any blooms if you recreate in this area.

Tickelnaked Pond – 0 reports – monitoring has ended for the season on this lake, please be mindful of conditions and report and avoid any blooms if you recreate in this area.

Townshend Lake – 0 reports – monitoring has ended for the season on this lake, please be mindful of conditions and report and avoid any blooms if you recreate in this area.

Vermont Drinking Water Facilities Report

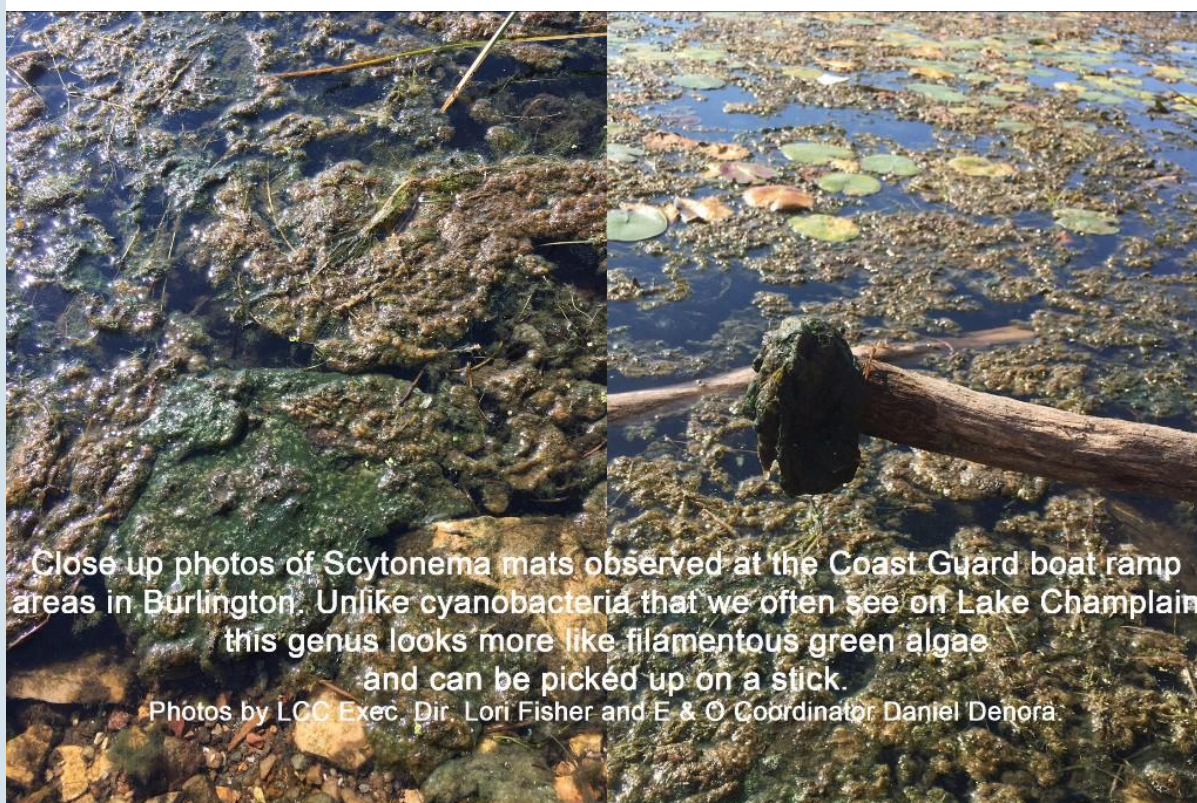
There were no toxin detections this week. This is the last week of the 12-week routine monitoring program for VT facilities on Lake Champlain which is funded by the Lake Champlain Basin Program. The VDH and the VT Drinking and Groundwater Protection Division will continue to work with water facilities to monitor conditions and test as needed. [Click here](#) to view results from this week's testing at Vermont Drinking Water Facilities and for a compilation of results from the last few weeks and recent years.

New York Lake Champlain Beaches

We have received no reports of closures this week. Check with beach or municipal officials for current conditions.

New York Inland Lakes

Cyanobacteria blooms and beach closures have been reported for some NY inland lakes. For more information, visit the New York Harmful Algae Blooms Notification Page - <http://www.dec.ny.gov/chemical/83310.html>. The site is generally updated at least weekly.



Close up photos of Scytonema mats observed at the Coast Guard boat ramp areas in Burlington. Unlike cyanobacteria that we often see on Lake Champlain this genus looks more like filamentous green algae and can be picked up on a stick.

Photos by LCC Exec. Dir. Lori Fisher and E & O Coordinator Daniel Denora.

SCYTONEMA MATS

As noted earlier, a different genus of cyanobacteria was recently observed at the Coast Guard Boat ramp in Burlington. It's called Scytonema (also known as Lyngbya) and is the same organism that was found over the water intake pipe in Rouses Point in 2012. The mats covered

Coast Guard station. LCC and VT DEC staff took water samples that were analyzed by the state lab and revealed that the mats were nearly 100% Scytonema with some entangled Microcystis and Anabena (the cyanobacteria more commonly found in Lake Champlain). Scytonema is known to produce toxins and skin irritants. It forms mats that are coarse to the touch, stringy if you pull them apart and similar to decaying filamentous green algae and dark enough to be mistaken for green algae like Cladophora which is often observed on Lake Champlain. As such, it doesn't match up with our typical guidance for cyanobacteria. We will be updating our protocols for identifying cyanobacteria but in the interim here's some guidance to help you distinguish this from common filamentous green algae:

- Coloration of these benthic mats is dark olive-green blue. They are very cohesive and can be lifted from the water with a stick (see my photo below) like filamentous green algae.
- Unlike green algae, they are not hairy or stringy. Instead the mats form cohesive lumps, flaps and flat layers that do not separate easily when gently pulled.
- They are rough to the touch rather than slippery like some of the common filamentous green algae. We recommend not to touch them bare-handed.
- They usually form bottom-dwelling mats but can also float on the surface as was the case at the Coast Guard location.
- Scytonema is somewhat mobile. If you leave a sample of the mat in water and undisturbed, you will observe filaments separating from the main mass along the edges. These will be deep blue-green in color. Over a longer period, the water will also turn bluish-green as the filaments begin to fragment and float free. Filamentous green algae are not mobile and will not move out from the main clump of material under still conditions. After sitting for a while, they may release spores that may turn the water grass or dark green.
- Scytonema is reported to produce saxitoxin (a neurotoxin) and an unknown hepatotoxin (liver toxin).
- Like all cyanobacteria, they should be considered potentially toxic and avoided.

CHECK OUT THE DATA TRACKER MAP

You can see a full compilation of the monitoring reports on the [cyanobacteria tracker map](#) housed at the Vermont Department of Health (VDH). LCC adds reports on a daily basis and they are accessible to anyone with an internet connection. The site is a great resource to learn

sites, and find out the status of lake conditions based on the most recent report. The date of the last monitoring report and status of conditions will appear in a table on the right. On the map, green dots indicate **generally safe conditions**, yellow dots note **low alerts**, and red dots highlight **high alerts**. The low and high alert ratings don't change until the next report is filed. The vast majority of the data are provided by LCC monitors who report from over 100 locations on Lake Champlain and inland lakes. VDH will keep the site live for several more weeks this fall.

LEARN MORE ABOUT CYANOBACTERIA

[Check out LCC's website](#) for more information about cyanobacteria. You'll find additional resources at the links below to help you identify and avoid blooms. [Click here and sign up](#) if you're interested in getting trained as a monitor for the 2018 season or just want to learn more about cyanobacteria.

- [LCC reporting form](#)
- [LCC instructions for categorizing water conditions](#)
- [LCC instructions for photographing blooms and taking water samples](#)
- [LCC flier on how to differentiate blooms from other lake phenomena](#)

WHAT TO DO IF YOU SEE OR SUSPECT A BLOOM

- Report it to the Lake Champlain Committee using our [online form](#). Click [here for how to assess conditions](#).
- Avoid contact with the water in the area of the bloom.
- If you've been in contact with a bloom, rinse and shower thoroughly as soon as possible.
- Keep people (especially children) and pets out of the water.
- Do not drink untreated lake water. If you suspect a bloom near your intake, don't drink, cook or shower with the water. Boiling water does **not** destroy toxins.
- See a doctor if someone gets ill after exposure to a cyanobacteria bloom and have them report bloom-related illnesses to the health department.

WHAT HAPPENS TO THE CYANOBACTERIA MONITORING DATA?

Lake Champlain Committee monitor reports are recorded on the [Lake Champlain cyanobacteria tracking map](#) housed at the Vermont Department of Health. All reports are vetted by the Lake Champlain Committee or our partners at VDH and the VT DEC before they show up on the tracker. You should be able to check the map throughout the season for data on Lake Champlain sites as well as several inland lakes. The vast majority of information provided on the site come from LCC's cyanobacteria monitors. It's a clear illustration of the critical role these "citizen scientists" play in assessing lake conditions. The weekly reports are also provided to public health, environmental, and recreation agencies and managers and interested citizens. [Please pass on this link](#) to anyone you think might be interested in receiving our weekly emails.

SPREAD THE WORD

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Appendix F – Example of Select Reports to Media

8/31/17 LCC Cyanobacteria Primer to Lake Champlain Basin Media

Note: In addition to providing media with an update on the weekly conditions observed by monitors, each weekly email contained links to resources for further information, photos illustrative of conditions, data tracker information, and background on the monitoring program, funding and partners. This way the Media had ready access to a host of educational resources to better inform their reporting. (Because the email was constructed in MailChimp, not all the content is viewable in this report. Contact LCC if you'd like to receive the original via email.)

From: Lori Fisher

Sent: Thursday, August 31, 2017 3:57 PM

To: Lake Champlain Basin Media

Subject: LCC Cyanobacteria Primer

To ensure you receive email from LCC, please add lcc@lakechamplaincommittee.org and lorif@lakechamplaincommittee.org to your safe/allowed list.

[View this email in your browser](#)



Dear Media Partner,

As we head into the Labor Day weekend [Lake Champlain Committee \(LCC\)](#) monitors are reporting both clear conditions and cyanobacteria blooms. While many beaches are open and safe for swimming so far this week we have received bloom reports for Bulwagga Bay, Maquam Shore, St. Albans Bay, Missisquoi Bay, Lake Carmi, Shelburne Pond and Ticklenaked Pond .

These last weeks of summer are precious times to be out on and around water. Just as

everyone who hikes needs to be mindful of poison ivy, everyone who recreates in water should learn to recognize, report and avoid cyanobacteria blooms. Please help us get the message out to the public.

[Here's a link to a video](#) that LCC and partners collaborated on to help people identify cyanobacteria. Please share it through your reporting channels and let people know they can sign up for LCC's weekly cyanobacteria reports through this link: <https://www.lakechamplaincommittee.org/lcc-at-work/algae-in-lake/cyanobacteria-weekly-report-subscription/>. Anyone who sees a bloom should [take pictures](#) and report it right away using the [Lake Champlain Committee's online form](#).

The wet spring and summer have flushed a lot of nutrients into the water which sets the table for blooms once the water warms up, particularly if the weather is calm and still. Wind and rain can move scums throughout the bays or break them up. Cyanobacteria conditions can vary widely over short time frames and short distances. Some blooms persist for days while others pop up and disappear within a span of hours. Blooms are pushed by prevailing winds, leading to denser shoreline accumulations downwind.

We have included further information below along with links and photos to help you recognize and report on cyanobacteria and provide information to the public.

Thanks for helping get the word out,

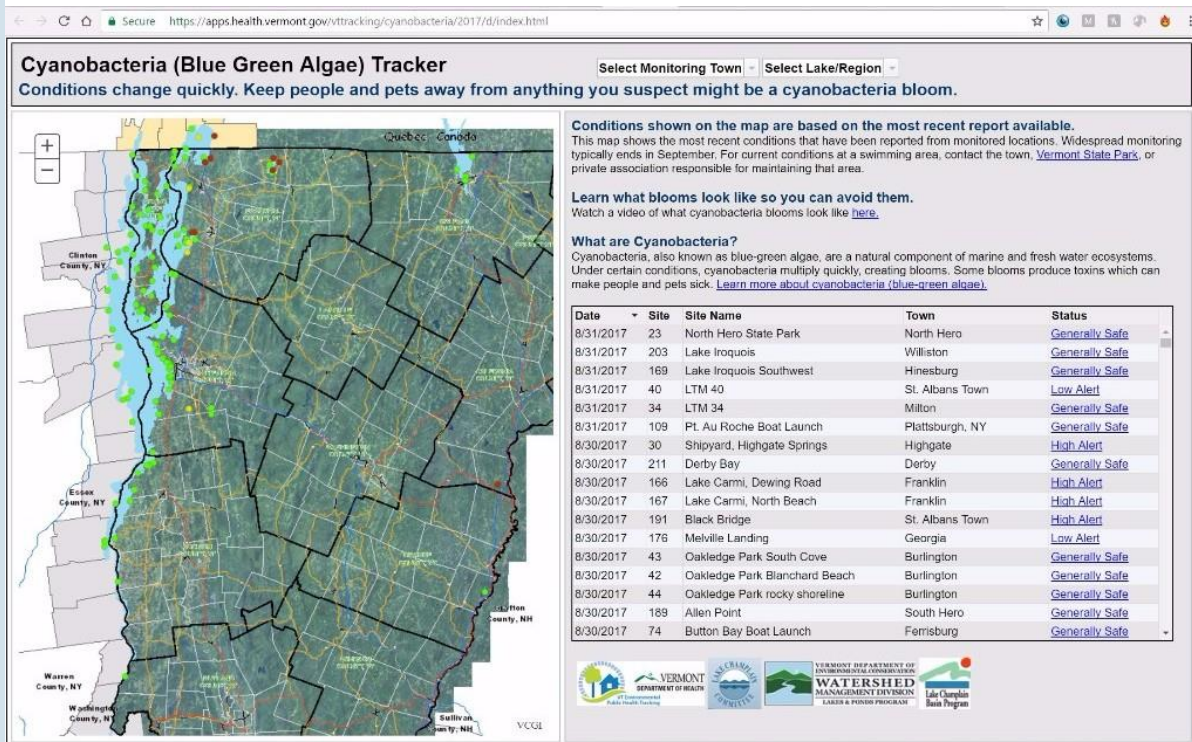


Lori Fisher, LCC Executive Director

CHECK OUT THE DATA TRACKER MAP

You can see a full compilation of the monitoring reports on the [cyanobacteria tracker map](#) housed at the Vermont Department of Health. LCC adds reports on a daily basis and they are accessible to anyone with an internet connection. The site is a great resource to learn about conditions throughout the season. You can select a lake segment or lake, zoom in on sites, and find out the status of lake conditions based on the most recent report. The date of the last monitoring report and status of conditions will appear in a table on the right. Green dots indicate **generally safe conditions**, yellow dots note **low alerts**, and red dots highlight **high alerts**. The low and high alert ratings don't change until the next report is filed.

Please check out the site and let lake users know about this resource. The vast majority of the reports are provided by LCC monitors who report from over 100 locations on Lake Champlain and inland lakes.



LEARN MORE ABOUT CYANOBACTERIA

[Check out LCC's website](#) for more information about cyanobacteria. You'll find additional resources at the links below to help identify and avoid blooms.

- [LCC reporting form](#)
- [LCC instructions for categorizing water conditions](#)
- [LCC instructions for photographing blooms and taking water samples](#)
- [LCC flier on how to differentiate blooms from other lake phenomena](#)
- [Video to help identify cyanobacteria](#)
- [Cyanobacteria Fact Sheet](#)
- [NY Dogs and Harmful Algal Blooms Fact Sheet](#)
- [VT Fact Sheet for Veterinarians](#)

One of the ways to confirm that what you're seeing is cyanobacteria is to do a jar test.
Wear gloves and take a water sample in a clear glass jar (left photo).
Place the jar in the sun and wait about a half hour (right photo).
Cyanobacteria will rise toward the surface; detritus will sink. LCC file photos.



2014-06-28 - Bev Monitor - 11:30 am
Westport Boat Launch - Jar test



2014-06-28 - Bev Monitor - 12:00 pm
Westport Boat Launch - Jar test

STAY SAFE

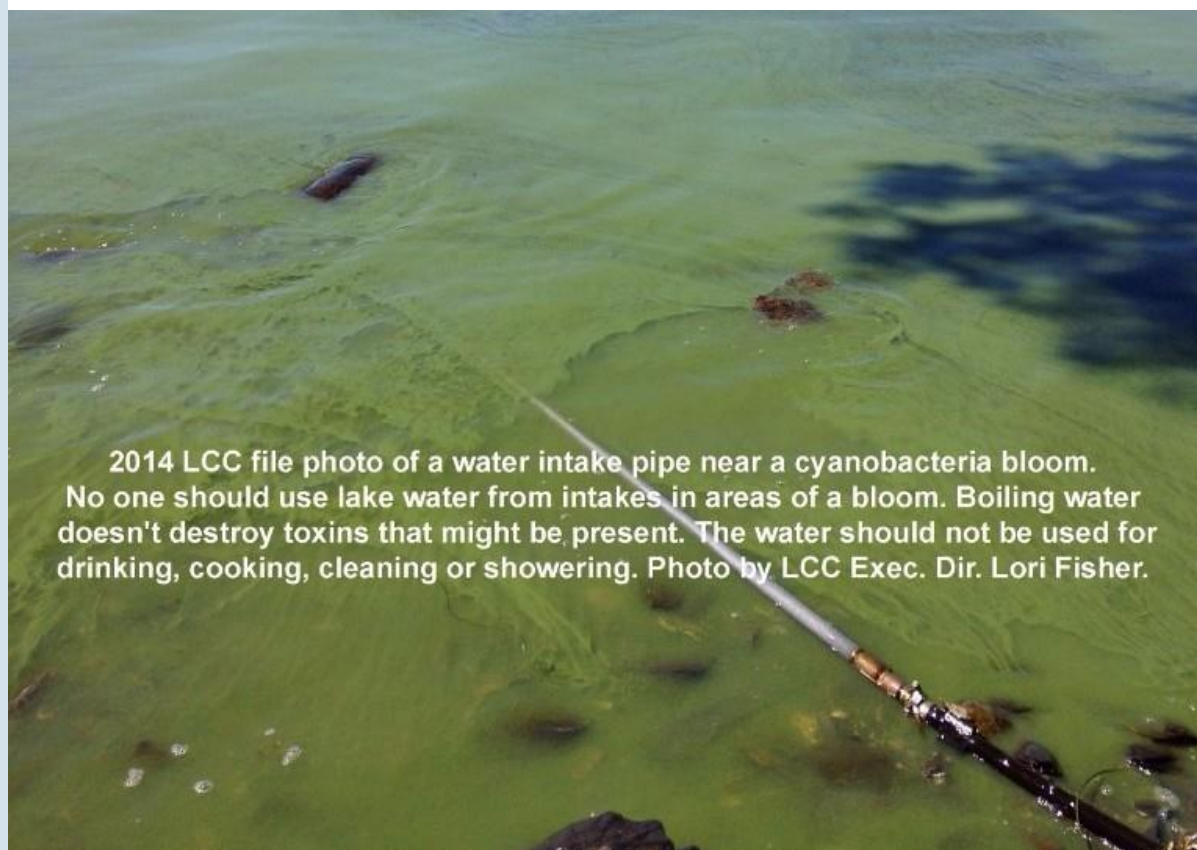
Avoid any contact with green scummy waters or water where there is a suspected bloom. Contact with a bloom can cause skin rashes and stomach illness including nausea, vomiting and diarrhea. Aerosolized water droplets with algae in them can produce allergy-like symptoms. Some species under some conditions can produce toxins that affect the liver while other species' compounds affect the nervous system. You cannot tell if a bloom contains toxins by looking at it, the only way to be sure is through a water test. Children and dogs are most vulnerable because they are less particular about what they eat or drink or where they swim; they are more likely to ingest water; they are smaller so a dosage has a greater affect. Dogs can receive a larger dose of toxins when they swim in a bloom then lick their fur. The deaths of two dogs during the summers of 1999 and 2000 were attributed to cyanobacteria toxin poisoning from Lake Champlain water.

WHAT TO DO IF YOU SEE OR SUSPECT A BLOOM

- Report it to the Lake Champlain Committee using our [online form](#). Click [here for how to assess conditions](#).
- Avoid contact with the water in the area of the bloom.

possible.

- Keep people (especially children) and pets out of the water.
- Do not drink untreated lake water. If you suspect a bloom near your intake, don't drink, cook or shower with the water. Boiling water does **not** destroy toxins.
- See a doctor if someone gets ill after exposure to a cyanobacteria bloom and have them report bloom-related illnesses to the health department.



2014 LCC file photo of a water intake pipe near a cyanobacteria bloom. No one should use lake water from intakes in areas of a bloom. Boiling water doesn't destroy toxins that might be present. The water should not be used for drinking, cooking, cleaning or showering. Photo by LCC Exec. Dir. Lori Fisher.

WHAT HAPPENS TO THE CYANOBACTERIA MONITORING DATA?

Lake Champlain Committee monitor reports are recorded on the [Lake Champlain cyanobacteria tracking map](#) housed at the Vermont Department of Health. All reports are vetted by the Lake Champlain Committee or our partners at VDH and the VT Dept. of Environmental Conservation before they show up on the tracker. The map provides data on Lake Champlain sites as well as several inland lakes throughout the season. The vast majority of information provided on the site come from LCC's cyanobacteria monitors. It's a clear illustration of the critical role these "citizen scientists" play in assessing lake conditions. The weekly reports are also provided to public health, environmental, and recreation agencies and managers and interested citizens. [Please pass on this link](#) to anyone you think might be interested in receiving our weekly emails.



SPREAD THE WORD

Please help spread awareness about the risks of cyanobacteria and actions to take to avoid exposure and reduce bloom frequency. No one should be drinking untreated lake water regardless of whether or not there is a bloom. People who draw water from the lake and suspect a bloom near their intake should not drink, cook, wash dishes or shower with the water. Boiling water doesn't destroy toxins.

Blooms are caused by a combination of warm water temperatures and high concentrations of nutrients in the water, particularly phosphorus. Reducing the supply of phosphorus is key to reducing blooms. LCC urges everyone to [take personal actions to protect water quality](#) and advocate for stringent controls to reduce nutrients flowing into the lake.

BACKGROUND ON LCC's MONITORING PROGRAM

The Lake Champlain Committee (LCC) developed a cyanobacteria monitoring program for Lake Champlain in 2003/2004 and has overseen the citizen-based program ever since. The focus of the program is to raise awareness of the issue, build a database of information on

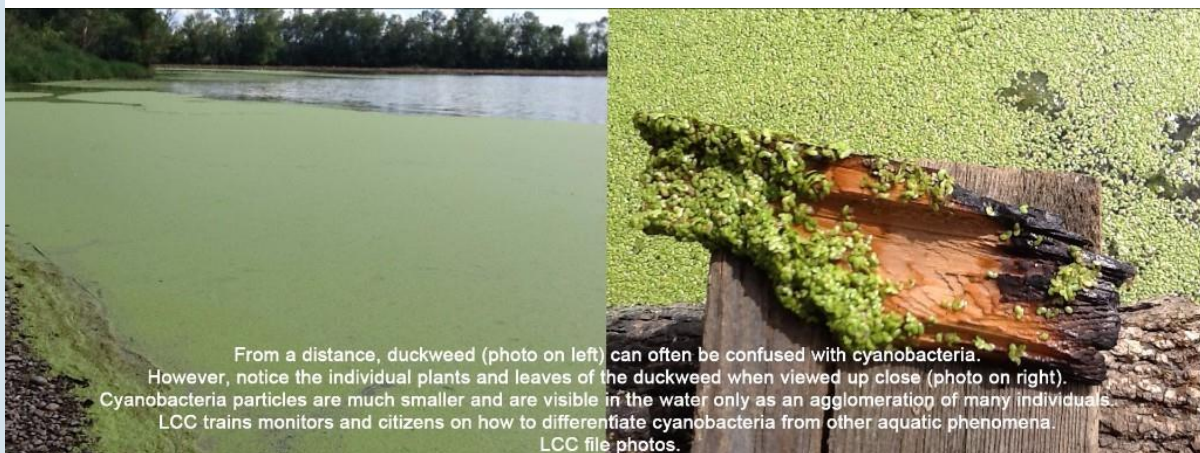
gathered will help us better understand the triggers for blooms and aid in the work to reduce their frequency.

LCC coordinates our monitoring program closely with Vermont and New York health, environmental and recreation agencies. We annually train hundreds of citizens in methods to assess and report on water conditions. We also conduct trainings for state and municipal park staff, town health officers, and public water supply operators. LCC monitors provide important data on lake health from more than 100 Lake Champlain and inland lake locations.

Burlington waterfront staff at their training session on how to identify and report on cyanobacteria to keep the beaches safe. LCC annually trains hundreds of recreational personnel and citizens to serve as monitors at over a 100 Lake Champlain and inland lake locations. Photo by Lori Fisher.



The Lake Champlain Committee's cyanobacteria monitoring program is funded by [LCC members](#) and the Lake Champlain Basin Program. Key program partners include the Vermont Department of Environmental Conservation, Vermont Department of Forests, Parks, and Recreation, Vermont Department of Health, New York Department of Environmental Conservation, New York Department of Health, and the Lake Champlain Basin Program.



From a distance, duckweed (photo on left) can often be confused with cyanobacteria. However, notice the individual plants and leaves of the duckweed when viewed up close (photo on right). Cyanobacteria particles are much smaller and are visible in the water only as an agglomeration of many individuals. LCC trains monitors and citizens on how to differentiate cyanobacteria from other aquatic phenomena. LCC file photos.



[LCC's Facebook Page](#)



[LCC's Website](#)



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