

Monitoring and Evaluation of Cyanobacteria in Lake Champlain



June 2012

Final Report

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**MONITORING AND EVALUATION OF CYANOBACTERIA
IN LAKE CHAMPLAIN**

Summer 2011

Report to

Lake Champlain Basin Program

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EXECUTIVE SUMMARY

In 2011, monitoring for potential toxin-producing cyanobacteria continued on Lake Champlain with the following specific objectives:

- Continue monitoring of BGA at the Long-term Water Quality and Biological Monitoring Project sites in partnership with the Vermont DEC, and at selected stations in the greater Burlington area, St. Albans Bay and Missisquoi Bay.
- Continue to work with volunteer citizen monitors in Missisquoi Bay, the north lake, and other selected sites (in partnership with the Lake Champlain Committee).
- Continue screening for the presence of toxins when potential toxin-producing BGA are observed.
- Continue to use a tiered BGA alert system framework, incorporating data and knowledge gained in previous years.
- Continue e-mail communication network among state and provincial agencies in Vermont, New York and Quebec to facilitate regular exchange of information about current BGA conditions and the potential for human exposure to toxins.

Collections of net and whole water plankton began in June in most locations, and continued through October. Sample sites encompassed all of Lake Champlain, but a special effort was made in Missisquoi Bay, St. Albans Bay, and the north lake, areas known to have problems with toxic blooms in the past. Citizen monitors living around the lake near 18 specific sites were recruited to collect samples from shoreline locations where algae accumulated.

In 2011, bloom conditions occurred in Missisquoi Bay and in other locations throughout Lake Champlain. Microcystin concentrations were generally low, but reached 180.82 µg/L in Missisquoi Bay. Measurable concentrations of anatoxin-*a* were only detected in one sample, from Begg's Park, New York.

Once again, our e-mail notification system worked well to keep public health officials informed about algal and toxin conditions. In 2011, we continued to collaborate with Vermont Department of Health to post information about blue-green algae and the weekly results of our testing on their web site to improve communication with all users of Lake Champlain. Information from all locations where samples were tested was included on the website.

INTRODUCTION

Lake Champlain is one of the largest lakes in the United States and is often called the "Sixth Great Lake." Although primarily a recreational lake, it also serves as a source of drinking water and a site for the disposal of municipal wastes in communities throughout the basin.

In response to a dog-poisoning attributed to cyanobacteria toxins in 1999, the LCBP initiated a study to investigate the occurrence of potential toxin-producing cyanobacteria and their toxins in Lake Champlain in 2000. Over the following years, this monitoring program has evolved to document the presence and extent of toxic cyanobacteria blooms in Lake Champlain, and the levels of cyanotoxins that have occurred.

In addition, a project supported through NOAA's MERHAB program began in 2002 and continued through 2007 on Lake Champlain, through a partnership between UVM, SUNY-ESF and SUNY-Plattsburgh. The project has multiple objectives, including documenting the distribution of cyanotoxins in the lake, developing a rapid screening method for anatoxin-*a*, and developing methods for monitoring throughout the lower Great Lakes (Lakes Erie, Ontario and Champlain). Data collected from this project are not available rapidly enough to drive the weekly public alert system, but data are regularly shared among the project investigators.

Beginning in 2003, regular monitoring has been conducted by UVM in partnership with the LCBP long-term monitoring program and with citizen monitors recruited with the assistance of the Lake Champlain Committee. In 2011 we continued this effort with the following specific objectives:

Objectives:

- Continue monitoring of BGA at the Long-term Water Quality and Biological Monitoring Project sites in partnership with the Vermont DEC, and at selected stations in the greater Burlington area, St. Albans Bay and Missisquoi Bay.
- Continue to work with volunteer citizen monitors in Missisquoi Bay, the north lake, and other selected sites (in partnership with the Lake Champlain Committee).
- Continue screening for the presence of toxins when potential toxin-producing BGA are observed.
- Continue to use a tiered BGA alert system framework, incorporating data and knowledge gained in previous years
- Continue e-mail communication network among state and provincial agencies in Vermont, New York and Quebec to facilitate regular exchange of information about current BGA conditions and the potential for human exposure to toxins.

METHODS

Field Collection

To survey plankton populations lakewide, we established partnerships with the VT DEC and NY DEC staff conducting the LCBP long-term monitoring program. VT DEC staff collected plankton samples from the 15 LTMP sites during their routine collections (Tables 1, Figure 1). Working with the Lake Champlain Committee, we also recruited volunteers to sample shoreline locations in Missisquoi Bay, Maquam Bay, and other areas of the lake (Table 2, Figure 1). We also sampled sites in Missisquoi Bay, St. Albans Bay, and Burlington Bay, where the highest population density of basin residents live and two large water supply systems draw their water.

Frequency. Monitoring for the presence of BGA began in June at the LTMP sites and at the UVM sites and in early July at the citizen monitoring sites. The LTMP sites were sampled approximately biweekly regardless of bloom conditions, as dictated by the state's regular program activities. Frequency of sample collection in Burlington Bay, Missisquoi Bay, and St. Albans Bay was bi-weekly or weekly, as determined following the tiered alert system framework (Table 3). This framework, based on recommendations in Chorus and Bartram (1999) calls for less frequent sampling initially, then weekly sampling once bloom conditions appear. Citizen monitors sampled weekly from July through August. In Missisquoi and St. Albans Bay, weekly sampling was initiated in July and continued through October, when cell densities indicated the decline of the bloom.

Analytical Parameters. The following types of samples were collected in Burlington Bay, St. Albans Bay and Missisquoi Bay during 2011:

- whole water and net plankton
- whole water for total nitrogen
- whole water for total phosphorus
- whole water for toxins (the analysis of this parameter began when microscopic analysis indicated potential toxin-producing taxa have reached densities of concern)

At the LTMP sites, only net plankton samples were collected for this project; however, total nitrogen, total phosphorus, and chlorophyll samples were collected as part of the Long-Term Biomonitoring Project.

Sample Collection. Net plankton samples were obtained using a 63- μ m Wisconsin net. A single 3 m tow was collected, placed in a cooler, and transported back to the laboratory where the total volume was recorded and a subsample was preserved for analysis.

Total nitrogen, total phosphorus, and whole water plankton samples were collected by surface grab sampling. Two replicates were collected for each parameter.

The following tables and maps document sampling locations on Lake Champlain.

Table 1. Location of monitoring sites sampled by UVM and VT DEC.

Sample site – Location or number	Latitude	Longitude
Alburgh	44°59.5548'	73°12.8382'
Highgate Cliffs	45°00.494'	73°05.977'
Highgate Springs	44°59.506'	73°06.803'
Rock River Access	44°59.3124'	73°05.2914'
Rte 78 Access	44°58.078'	73°13.267'
St. Albans Boat Launch	44°47.6544'	73°10.3362'
North Beach	44°29.4084'	73°14.2536'
Red Rocks Beach	44°26.5134'	73°13.4664'
VTDEC Sta02	43°42.89'	73°22.98'
VTDEC Sta04	43°57.10'	73°24.47'
VTDEC Sta07	44°07.56'	73°24.77'
VTDEC Sta09	44°14.53'	73°19.75'
VTDEC Sta16	44°25.55'	73°13.92'
VTDEC Sta19	44°28.26'	73°17.95'
VTDEC Sta21	44°28.49'	73°13.90'
VTDEC Sta25	44°34.92'	73°16.87'
VTDEC Sta33	44°42.07'	73°25.09'
VTDEC Sta34	44°42.49'	73°13.61'
VTDEC Sta36	44°45.37'	73°21.30'
VTDEC Sta40	44°47.12'	73°09.73'
VTDEC Sta46	44°56.90'	73°20.40'
VTDEC Sta50	45°00.80'	73°10.43'
VTDEC Sta51	45°02.50'	73°07.78'

Table 2. Location of monitoring sites sampled by citizen monitors.

Site	Description of Location
Vermont	
Carry Bay	Savage Pt. East
Chapman Bay	southwest of Canadian border
City Bay	middle of North Hero, eastern side, off of Rte. 2
Donaldson Point	northeast of Sandy Pt.
High Rocks	northeast of Rock River Bay
Highgate Springs- Shipyard	southwest of boat ramp
Larrabees Point	Shoreham, Lat 43° 51.325', Lon 073° 22.594'
Kingsland Bay	Ferrisburgh
Maquam Bay	Boat ramp at the town beach in Swanton
North Hero State Park	southeast of Stephenson Pt.
Pelots Bay	Savage Pt. South
St. Albans Bay Park	State Park, off of Rte. 36
New York	
Beggs Park	Town Beach at Essex
Point Au Roche State Park	St. Armand Beach
Rouses Point	water treatment plant, near flushing line
Willsboro Bay	near water filtration intake

Figure 1. 2011 sampling sites in Lake Champlain.

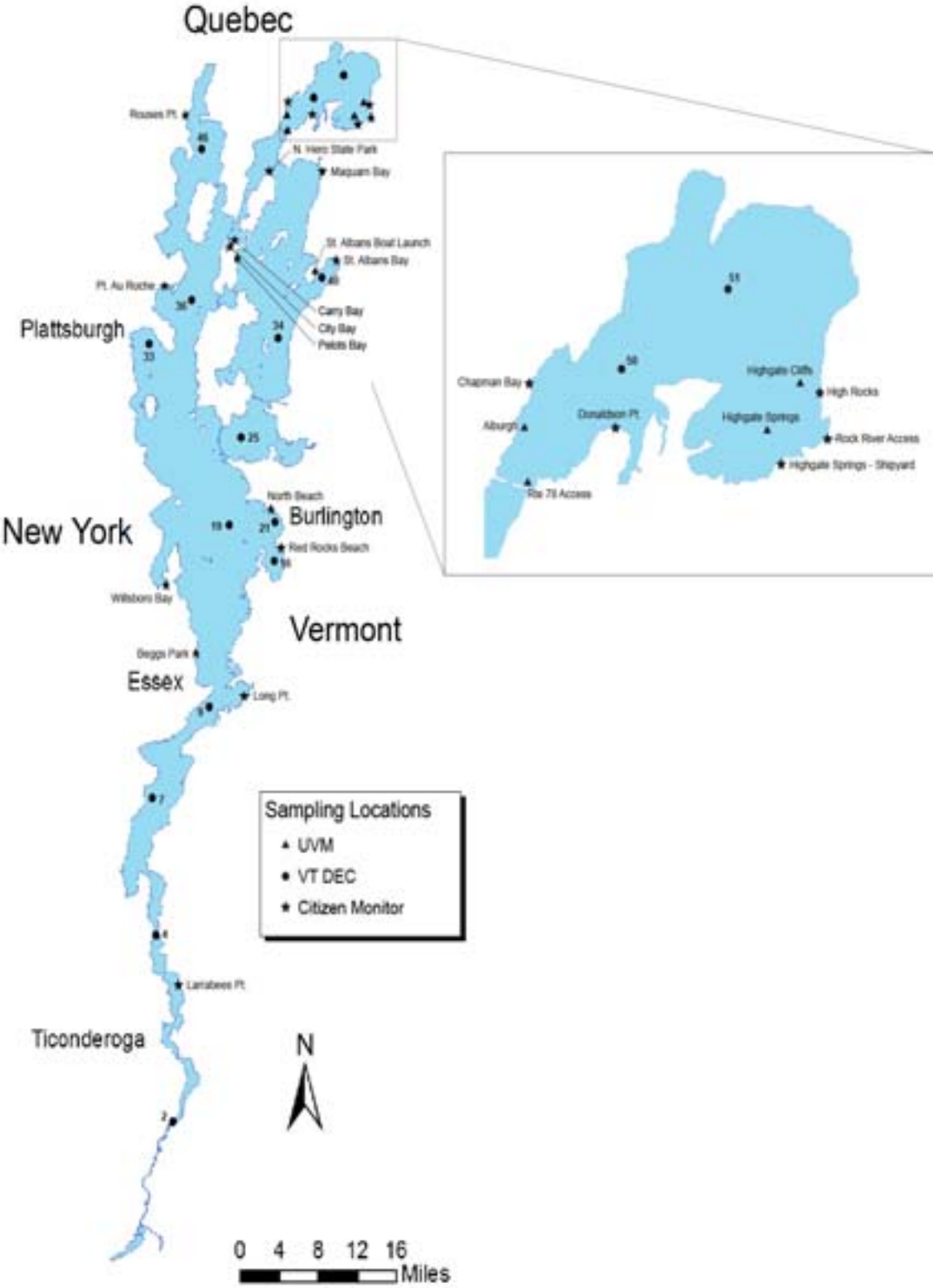


Table 3. Outline of our prototype tiered sampling and alert framework.

Qualitative Sampling

Frequency: 2/month

Collect: Vertical plankton tows (63- μ m net, upper 3 m)
Screened within 48 hours

Conclusions: If potential toxin-producing taxa observed,
proceed to *Quantitative sampling*

Quantitative Sampling

Frequency: 2/month

Collect: Vertical plankton tow (63- μ m net, upper 3m)
Full enumeration within 48 hours

Conclusions: If BGA reaches densities reach 2000 cells/mL,
proceed to *Vigilance level*

Vigilance Level

Frequency: 1/wk at midday

Collect: Vertical plankton tow (63- μ m net, upper 3m)
Full enumeration within 48 hours

Conclusions: If BGA exceed 4,000 cells/mL, proceed to *Alert Level 1*
Return to *Quantitative sampling* if densities fall below 2,000 BGA cells/mL
Notify public health officials that BGA are abundant and blooms could form

Alert Level 1

Frequency: 1/wk at midday (or more frequently as needed)

Collect: Whole water phytoplankton samples
Whole water chlorophyll *a*
Whole water toxin samples

Conclusions: If microcystin concentration exceeds 6 μ g/L (VDH recreational standard),
proceed to *Alert Level 2*
Notify public health officials of potential risks to humans and animals

Alert Level 2

Frequency: 1/wk at mid-day (or more frequently as weather conditions dictate)

Collect: As for Alert Level 1

Conclusions: Return to *Alert Level 1* if microcystin concentration drops below 6 μ g/L
Notify public health officials that significant risk to humans and animals exists.
Public Health Advisories should be issued by appropriate agencies.

Preservation and Storage. Nalgene high-density polyethylene bottles were used for all samples, excluding total nitrogen samples which were collected in 50 mL polypropylene centrifuge tubes. Total phosphorus containers were cleaned with 2.4 N hydrochloric acid solution prior to use. Nitrogen samples were preserved with sulfuric acid to a pH less than 2 and stored at 4°C until analysis. Total phosphorus samples were frozen until analysis. Plankton samples were preserved with 1% Lugols iodine solution and stored in the dark until analysis. Lake water samples for toxin analysis were preserved in one of two ways: filtered and frozen upon return to the lab, filtered and delivered for analysis to Vermont Department of Health (VDH).

Sample Analysis

Net and Whole Water Plankton. Plankton were analyzed either as qualitative or quantitative samples. Initially samples were evaluated qualitatively: all taxa present were noted and recorded. Once potentially toxic cyanobacteria were identified in the samples, evaluation became quantitative; individual algal units in the samples were identified and enumerated, and densities were calculated for each taxon. Whole water samples were collected when blooms were too dense to sample effectively by net samples; the same quantitative counting method, described below, was applied to both sample types.

For both sample types, an aliquot of well-mixed sample was placed in a Sedgwick Rafter cell and allowed to settle for 10 minutes. Slides were examined at 100X with phase contrast using inverted Olympus IX70 and IX71 microscopes. For qualitative screening, the entire chamber was scanned and algal taxa present were recorded. For quantitative screening, algal units were identified and enumerated. Counting continued until 100 cells of the most abundant genus had been observed or at least 10 fields had been examined. Algal units were categorized by size (single cells, fragments of colonies or filaments, small, medium, or large colonies or filaments). The enumerated natural units were multiplied by a cell factor to estimate cell densities (Table 4). Cell densities were extrapolated to reflect plankton populations in the original lake water.

Total Phosphorus. Total phosphorus samples were thawed and mixed thoroughly. An aliquot (generally 5 mL) was digested using ammonium persulfate (1998) and analyzed following Quikchem™ Method 10-115-01-1-F using a Lachat Quikchem™ 8000 Series Flow Injection Analyzer.

Total Nitrogen. Total nitrogen samples were analyzed using persulfate digestion (APHA 1998) and cadmium reduction following Quikchem™ Method 10-107-06-2-H using a Lachat Quikchem™ 8000 Series Flow Injection Analyzer.

Table 4. Cell factors used to estimate field densities of colonial algae.

Taxon	Unit Category	Estimated Cells/Unit	Cell Factor
<i>Anabaena spp.</i> , <i>Aulacoseira spp.</i> , <i>Fragilaria spp.</i>	fragment	1 – 20	10
	small	20 – 100	60
	medium	100 – 1000	500
	large	>1000	1000
<i>Microcystis spp.</i> , <i>Coelosphaerium spp.</i>	small	<100	50
	medium	100 - 1000	500
	large	>1000	1000
<i>Gloeotrichia spp.</i>	fragment	single trichome quarter of a colony	20
	small	colony	2500
	medium	half of a colony	5000
	large	entire colony	10,000
<i>Aphanizomenon spp.</i>	fragment	single trichome	measured
	small	small flake	200
	medium	medium flake	500
	large	large flake	1000

Toxin Sample Preparation. Filters for analysis of toxins by high performance liquid chromatography (HPLC) at the Vermont Department of Health were placed on ice and delivered to the lab within 24 hours. Filters for ELISA assay by UVM were placed in 15 mL glass centrifuge tubes with Teflon-lined caps in 8 mL of 50% methanol, shaken well and stored at -80°C until analysis.

Microcystin(s) by ELISA. Toxin samples in 50% methanol were thawed, shaken and re-frozen two times before beginning analysis. Extracted samples were diluted with deionized water until methanol represented less than 5% of the total volume, following recommendations to improve the accuracy of the method (Metcalf et al. 2000). Microcystin plate kits were purchased from Envirologix Inc. (Portland, ME).

Samples were run in duplicate following manufacturer's instructions on a KC Jr. plate reader (Biotek Instruments), utilizing standards provided in the kit. Mean values were used to determine the toxin concentration of each pair of samples. Samples exceeding the range recommended by the kit were diluted and re-analyzed. Samples below the range were also re-analyzed using manufacturer recommended dilution procedures for the standards.

Anatoxin-a by HPLC. At Vermont Department of Health, algal material was freeze-dried and then extracted with acidified methanol. Solid phase extraction cartridges were eluted with 100% methanol. Samples were analyzed following James et al. (1997).

RESULTS

Cyanobacteria and Toxins at the Monitoring Sites

The total number of samples collected and screened for phytoplankton densities and toxin analysis was about 500 in 2011 (Table 5).

Table 5. Number of quantitative samples collected and analyzed in the cyanobacteria monitoring program in 2011.

Sample Type	Phytoplankton*		Microcystin	Anatoxin***
	Net	Whole Water **	Whole Water	Whole Water
Number of Samples Collected	256	234	373	299
Number of Samples Analyzed	256	218	88	82
* Analyzed using Rapid Count Protocol				
** does not include wwp samples that had companion net samples				
***Analyzed at VDH				

The alert status reached and the maximum density of potentially toxic cyanobacteria cells at each site monitored are listed in Table 6. *Aphanizomenon* spp., *Microcystis* spp. and *Anabaena flos-aquae* were all widely distributed at sites across Lake Champlain.

Table 6. Summary of monitoring status achieved and cyanobacteria generic composition at monitoring stations in 2011.

LCBP Long Term Monitoring Program Sites

Region	Station/Location	Monitoring Status	Date Achieved	Maximum Density of Potentially Toxic Cells/mL	Cyanobacteria Present When Max Density Achieved
South	2. Benson Landing	Quantitative	06/07/11	824 (08/22/11)	<i>Microcystis, Aphanizomenon</i>
	4. Crown Point	Vigilance	07/05/11	2,217 (07/05/11)	<i>Aphanizomenon</i>
	7. Cole Bay	Alert 1	08/18/11	8,095 (08/18/11)	<i>Anabaena, Aphanizomenon</i>
	9. Diamond Island	Alert 1	08/18/11	9,250 (08/18/11)	<i>Anabaena, Aphanizomenon</i>
Main	16. Shelburne Bay	Quantitative	06/17/11	1,237 (08/19/11)	<i>Anabaena, Aphanizomenon</i>
	19. Main Lake	Alert 1	08/19/11	5,053 (08/19/11)	<i>Anabaena, Aphanizomenon</i>
	21. Burlington Harbor	Vigilance	08/19/11	3673 (08/19/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
	25. Malletts Bay	Quantitative	06/03/11	72 (10/04/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
Northwest	33. Cumberland Bay	Vigilance	09/01/11	2,462 (09/01/11)	<i>Microcystis, Aphanizomenon</i>
	36. Point au Roche	Quantitative	06/03/11	1573 (09/01/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
	46. Alburgh Center	Quantitative	06/08/11	505 (08/12/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
Northeast	34. Inland Sea	Quantitative	06/14/11	1,454 (08/09/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
	40. St. Albans Bay	Quantitative	06/14/11	1,640 (08/09/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
Missisquoi Bay	50. Missisquoi Bay	Vigilance	08/12/11	2,361 (08/12/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>

	51. Missisquoi Bay	Alert 1	07/19/11	7,987 (07/19/11)	<i>Anabaena, Microcystis, Aphanizomenon</i>
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UVM Monitoring Sites

Region	Location	Monitoring Status	Date Achieved	Highest Microcystin (µg/L) Observed	Maximum Density of Potentially Toxic Cells/mL	Cyanobacteria Present When Max Density Achieved
Main	North Beach-shoreline	Quantitative	06/06/11	not measured	0	<i>not observed</i>
	Red Rocks Beach-shoreline	Quantitative	06/06/11	not measured	0	<i>not observed</i>
Northeast	St. Albans Boatlaunch	Alert 1	08/02/11	0.05 (09/27/11)	20,340 (08/09/11)	<i>Anabaena, Aphanizomenon</i>
Missisquoi Bay	Rte. 78 Shoreline	Quantitative	09/20/11	not measured	8,796 (09/20/11)	<i>Anabaena, Aphanizomenon</i>
	Rte. 78 Access	Alert 1	08/09/11	1.27 (10/04/11)	32,357 (08/09/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Alburgh	Quantitative	06/07/11	not measured	1,388 (09/27/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Alburgh shoreline	Alert 1	07/26/11	1.38 (09/20/11)	10,952 (09/20/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Highgate Cliffs	Alert 1	07/05/11	3.08 (08/09/11)	41,161 (08/09/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Highgate Springs	Alert 2	08/09/11	10.39 (08/09/11)	1,039,733 (08/09/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>

Citizen Monitoring Sites

Region	Location	Monitoring Status	Date Achieved	Highest Microcystin (µg/L) Observed	Maximum Density of Potentially Toxic Cells/mL	Cyanobacteria Present When Max Density Achieved
South	Larrabee's Point	Vigilance	07/24/11	not measured	2,017 (07/24/11)	<i>Anabaena</i>
Main	Beggs Park	Alert 1	07/23/10	0.01 (07/31/11)	4,551 (07/23/11)	<i>Aphanizomenon</i>
	Kingsland Bay	Alert 1	08/21/11	0.01 (08/21/11)	6,629 (08/21/11)	<i>Aphanizomenon</i>
	North Beach-shoreline	Alert 1	08/29/11	0.03 (08/22/11)	6,007 (08/29/11)	<i>Anabaena, Aphanizomenon</i>
	Red Rocks Beach-shoreline	Alert 1	07/25/11	0.01 (08/29/11)	7,497 (08/29/11)	<i>Anabaena, Aphanizomenon</i>
	Willsboro Bay	Vigilance	08/21/11	not measured	3,806 (08/21/11)	<i>Anabaena, Aphanizomenon</i>
Northwest	Point au Roche	Alert 1	08/29/11	0.01 (08/29/11)	5,209 (08/29/11)	<i>Anabaena, Aphanizomenon</i>
	Rouses Point	Quantitative	08/01/11	not measured	772 (09/06/11)	<i>Aphanizomenon</i>
Northeast	Carry Bay	Alert 1	07/24/11	0.09 (07/24/11)	17,240 (07/24/11)	<i>Anabaena, Aphanizomenon</i>
	City Bay	Vigilance	08/29/11	not measured	2,631 (08/29/11)	<i>Microcystis</i>
	Maquam Bay	Quantitative	07/05/11	not measured	1,158 (07/26/11)	<i>Aphanizomenon</i>
	North Hero State Park	Alert 1	07/19/11	0.08 (08/14/11)	14,057 (08/29/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Pelots Bay	Alert 1	08/01/11	0.11 (08/29/11)	34,462 (08/29/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	St. Albans Bay Park	Alert 1	07/25/11	0.14 (07/25/11)	78,743 (08/01/11)	<i>Anabaena, Aphanizomenon</i>

Missisquoi Bay	Chapman Bay	Vigilance	08/07/11	not measured	2,850 (08/07/11)	<i>Anabaena, Aphanizomenon</i>
	Donaldson Point	Alert 1	08/27/11	0.18 (08/27/11)	11,426 (08/27/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	High Rocks	Alert 2	08/07/11	8.83 (08/07/11)	426,000 (08/07/11)	<i>Anabaena</i>
	Highgate Spings-Shipyard	Alert 2	09/25/11	180.82 (09/25/11)	940,549 (09/25/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
	Rock River Access	Alert 2	08/01/11	5.95 (08/01/11)	120,000 (08/01/11)	<i>Anabaena, Microcystis</i>

Supplemental samples collected when bloom conditions were apparent.

Location	Monitoring Status	Date Achieved	Highest Microcystin (µg/L) Observed	Maximum Density of Potentially Toxic Cells/mL	Cyanobacteria Present When Max Density Achieved
Melo Boat Slip*	Alert 1	08/18/11	not measured	1,990 (07/13/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
Donaldson Point***	Alert 1	08/18/11	0.14 08/18/11	129,823 (10/05/11)	<i>Anabaena, Aphanizomenon, Microcystis</i>
Dunham Bay***	Alert 1	08/22/11	0.82 (09/21/11)	79,333 (08/22/11)	<i>Anabaena, Aphanizomenon</i>
Holiday Point**	Quantitative	09/09/11	not measured	941 (09/09/11)	<i>Anabaena, Aphanizomenon, Microcystis, Oscillatoria</i>
North Hero House dock*	Quantitative	09/28/11	not measured	0 (09/28/11)	<i>Not observed</i>
Mallets Bay-NW shore near Sandbar Motel**	Alert 1	06/27/11	0.04 (06/27/11)	2,088,000 (06/27/11)	<i>Anabaena</i>
Button Bay**	Quantitative	07/13/11	not measured	474 (07/13/11)	<i>Anabaena, Aphanizomenon</i>
Northwest Bay**	Alert 1	08/18/11	not measured	5,774 (08/18/11)	<i>Anabaena, Aphanizomenon</i>

Sample collected by UVM*, VT DEC**, Citizen Monitor***

Microcystin was present in low concentrations at many sites throughout the 2011 summer season (Table 7). A few sites on the eastern side of Missisquoi Bay reached alert level 2. The maximum microcystin observed was 180.8 µg/L at Highgate Springs-Shipyard. Measurable anatoxin-*a* was only detected once, at Begg’s Park, New York on July 23, 2011.

Table 7. Number of samples tested and maximum concentration of microcystins measured in 2011.

Region	Collected by	Location	No. Samples Tested	Maximum Microcystin Conc. (µg/L)
Main Lake	Citizen Monitor	Beggs Park	1	0.01
		Kingsland Bay Beach	1	0.01
		North Beach shoreline	2	0.03
		Red Rocks Beach shoreline	1	0.01
	UVM	Melo Boat Slip	1	0.02
Mallets Bay	VT DEC	NW shore near Sandbar Motel	1	0.04
Missisquoi Bay	Citizen Monitor	Donaldson Point	1	0.18
		High Rocks	5	8.83
		Highgate Springs-Shipyard	4	180.82
		Rock River Access	4	5.95
	UVM	Alburgh	1	0.05
		Alburgh-Shore	7	1.47
		Donaldson Point	1	0.14
		Highgate Cliffs	18	3.42
		Highgate Springs	12	12.72
		Rte 78 Access	6	1.55
Northeast Lake	Citizen Monitor	Carry Bay	1	0.09
		Dunham Bay	2	0.82
		North Hero State Park	3	0.08

		Pelots Bay	3	0.11
Northwest Lake	Citizen Monitor	Point Au Roche State Park	1	0.01
South Lake	Citizen Monitor	Larrabee's Point	1	0.02
St. Albans Bay	Citizen Monitor	St. Albans Bay Park	4	0.14
	UVM	St. Albans Bay Boat Launch	7	0.05

Nutrients at the Cyanobacteria Monitoring Sites

Concentrations of total phosphorus (TP) and total nitrogen (TN) were averaged by date for monitoring sites in Burlington Bay, St. Albans Bay, and Missisquoi Bay. Mean concentrations of both nutrients were generally highest in Missisquoi Bay, but this pattern varied early in the season (Figure 2).

We also calculated the ratio of TN:TP in Burlington Bay, St. Albans Bay, and Missisquoi Bay (Figure 3). At all sites, the ratio remained below 29:1 except in late fall in the main lake. Additional analysis of the relationship between nutrient concentrations, nutrient ratios and phytoplankton composition is underway and will be part of separate publications.

Figure 2. Total Phosphorus concentrations (mg/L) in Missisquoi Bay, St. Albans Bay, and the Main Lake near Burlington over the 2011 growing season. Main Lake data is from VTDEC Stations 19 and 21 and UVM data, Missisquoi Bay data is from VTDEC Stations 50 and 51 and UVM data, and St. Albans Bay data is from VTDEC Station 40 and UVM data.

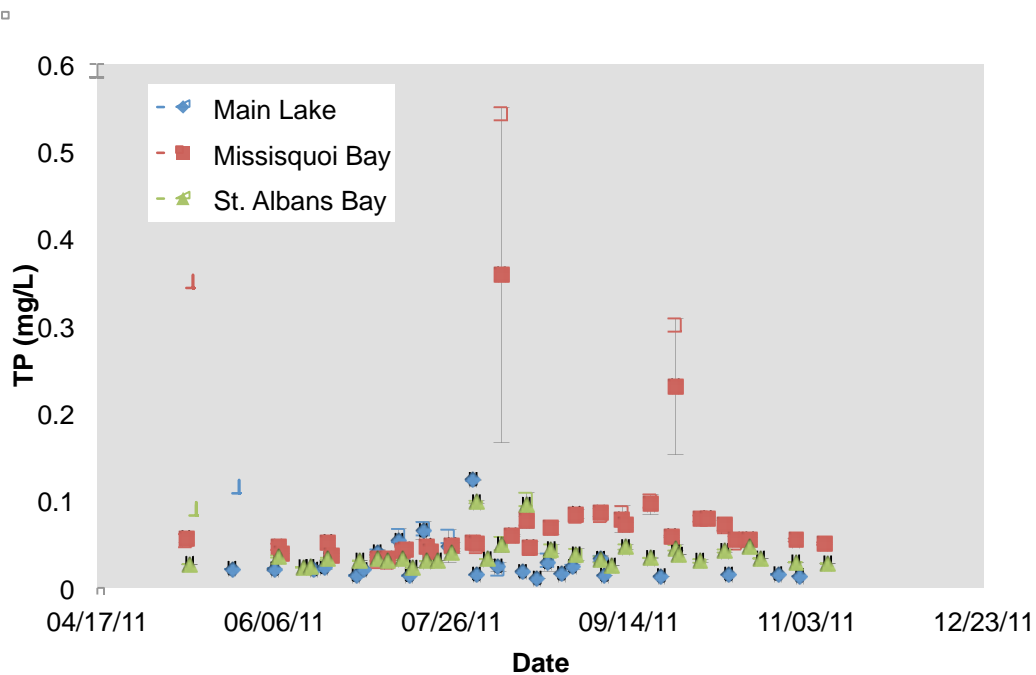
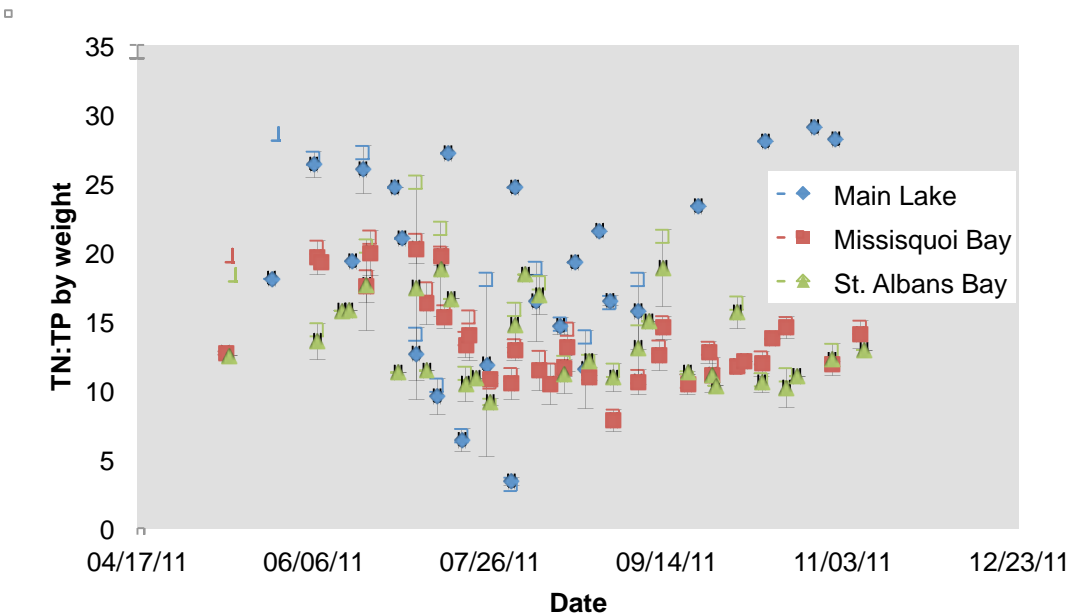


Figure 3. 2011 TN:TP ratios by weight across all sampling sites in Missisquoi Bay, St. Albans Bay, and the Main Lake near Burlington.



DISCUSSION AND CONCLUSIONS

Comparison of Patterns of Cyanobacteria and Toxins 2003-2011

The median densities of phytoplankton differed between Missisquoi Bay, St. Albans Bay, and Burlington Bay (Table 8), with St. Albans Bay showing the highest median density of potentially toxic cyanobacteria for the 2011 season. Seasonal mean generic composition (Figures 4-6) was within the range of previous years. The median microcystin concentrations in all lake segments were generally low, consistent with what has been observed in prior years (Table 9).

Table 8. Seasonal median densities of phytoplankton in Missisquoi, Burlington, and St. Albans Bays 2003-2011.

Median Densities per Year (cells/mL)										
Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Missisquoi Bay	Total Phytoplankton	15360	16533	11505	19677	181	2745	1254	1125	1525
	Total Potentially Toxic Cyanobacteria	6456	5933	3723	10295	0	1841	665	464	991
Burlington Bay	Total Phytoplankton	980	265	705	540	134	886	399	2552	965
	Total Potentially Toxic Cyanobacteria	312	70	188	111	34	115	96	526	728
St. Albans Bay	Total Phytoplankton	10024	5333	5587	5607	1635	2564	491	902	1825
	Total Potentially Toxic Cyanobacteria	5374	897	2624	4042	673	2296	207	647	1248

Figure 4. Seasonal mean percent generic composition of phytoplankton in Missisquoi Bay, 2003-2011.

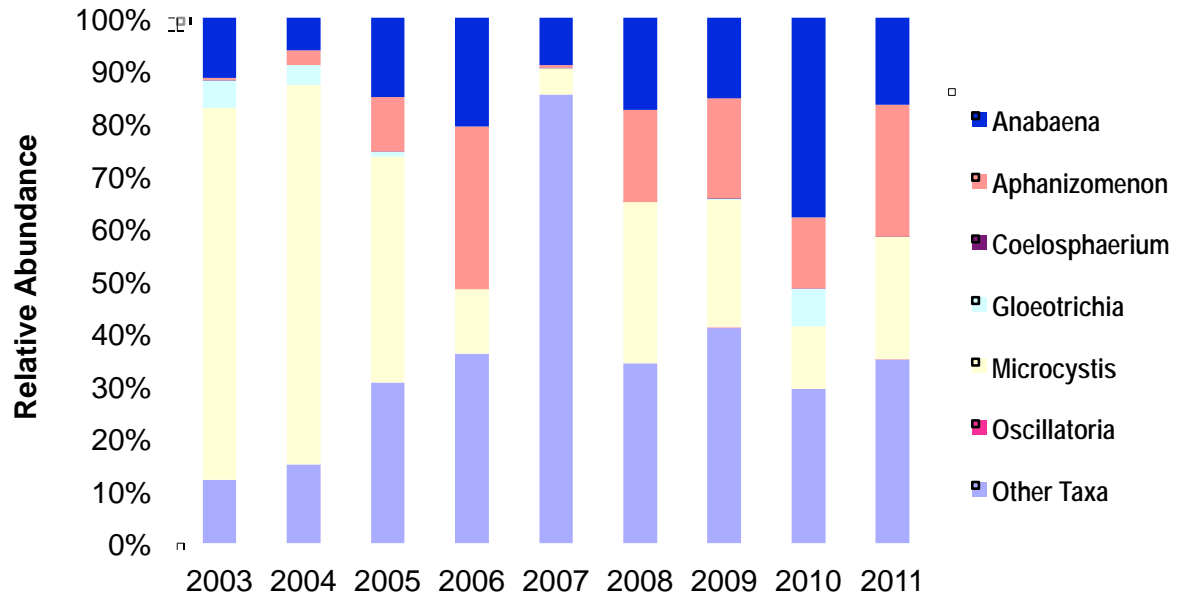


Figure 5. Seasonal mean percent generic composition of phytoplankton in St. Albans Bay, 2003-2011.

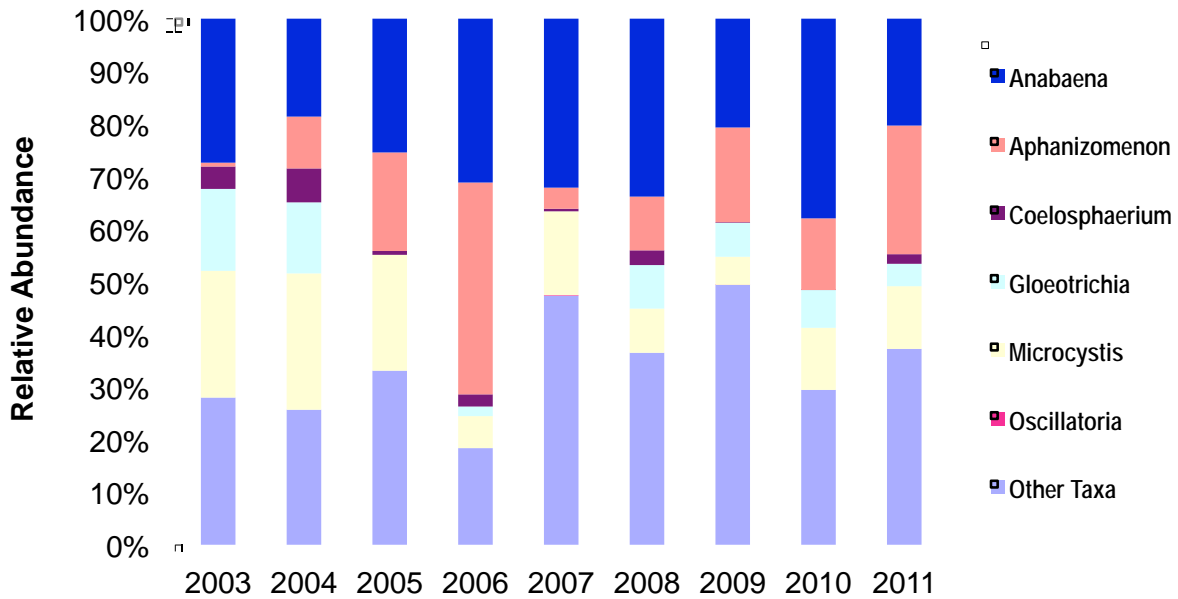


Figure 6. Seasonal mean percent generic composition of phytoplankton in Burlington Bay, 2003-2011.

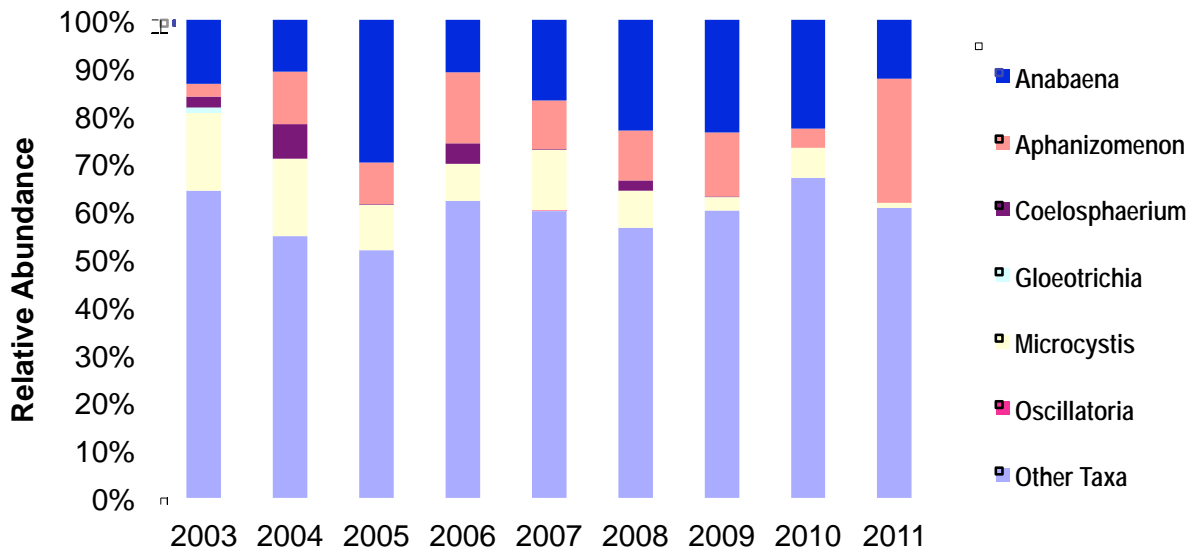


Table 9. Microcystin concentrations ($\mu\text{g/L}$) in various lake segments, 2003 – 2011.

Lake Region		2003	2004	2005	2006	2007	2008	2009	2010	2011
Burlington Bay/Main Lake	Median	0.02		7.42	0.04	2.82	0.47	0.03	0.13	0.01
	Range	ND - 0.12		6.04 - 8.80	0.04 - 3.47	0.02-5.61	0.03 - 1.49	0.03 - 23.36	0.02 - 0.14	0.01 – 0.03
	n	9		2	6	2	3	6	5	6
Missisquoi Bay	Median	0.20	0.88	0.74	0.64		2.30	0.54	0.03	0.65
	Range	ND - 23.90	ND - 6490	ND - 22.10	0.03 - 21.29		0.06 - 94.58	0.03 - 54.16	0.01 - 0.12	0.02 – 180.82
	n	160	142	125	134		86	29	10	59
Northeast Bays	Median	0.05	0.51	0.08	0.27	0.05	0.30	0.06	0.03	0.07
	Range	ND - 0.18	ND - 17.50	ND - 0.19	0.04 - 42.14	0.04-0.07	0.03 - 22.50	0.03 - 0.08	0.03 - 0.13	0.01 – 0.82
	n	6	8	7	14	4	4	3	3	10
South Lake	Median	0.53		0.05						0.02
	Range	ND - 1.4		ND - 0.067						0.02 – 0.02
	n	3		3						1
St. Albans Bay	Median	0.05	0.04	0.44	0.06	0.05	0.04	0.02	0.09	0.04
	Range	ND - 0.46	ND - 22.50	0.06 - 0.94	0.01 - 0.43	0.03-0.54	0.02 - 0.12	0.01 - 0.17	0.01 - 0.80	0.02 – 0.14
	n	16	22	15	34	40*	10	4	8	11
Northwest Lake	Median								0.03	0.01
	Range								0.03 - 0.03	0.01 – 0.01
	n								1	1

* includes extra samples as part of the SolarBee monitoring effort

Coordination

Coordination meetings were held with Vermont Department of Health officials in May 2011, and an e-mail distribution list that included about 40 partner organizations and individuals was again established for regular information sharing over the summer season. Beginning in June, weekly or bi-weekly e-mail updates on monitoring results were distributed to these officials and to other professionals with an interest in bloom conditions and public health. Working with the Vermont Department of Health, we also posted background information about cyanobacteria and cyanotoxins, and provided information for a map depicting bloom conditions across the lake on their website (http://healthvermont.gov/enviro/bg_algae/weekly_status.aspx). Information on bloom conditions was updated on a weekly basis from early July through mid-October.

The e-mail notification system again worked well in 2011 for rapid communication among the professional community. Our partnership with the Vermont Department of Health to post weekly information about bloom conditions on their website also continued to work well.

Our volunteer citizen monitoring effort also continues to be highly successful. In 2011, 18 volunteers, coordinated by the Lake Champlain Committee (LCC), collected samples across all major sections of the lake providing a good perspective on shoreline conditions lake-wide, and the LCC was able to collect samples from several transitory blooms in the main and northern lake.

ACKNOWLEDGMENTS

Principal funding for this project was provided by the Lake Champlain Basin Program, but additional support was provided by gifts to the Rubenstein Ecosystem Science Laboratory. We gratefully acknowledge Kirk Kimball and Marie Sawyer, Vermont Department of Health, who conducted the anatoxin-*a* analyses. We also thank Angela Shambaugh, Pete Stangel, and other staff of Vermont and New York DEC for assistance with field sampling; and Mike Winslow and Lori Fisher, Lake Champlain Committee and Jennifer Bowman, US Fish and Wildlife Service, who coordinated and assisted with the citizen monitoring effort. Finally, none of the shoreline data collection would have been possible without our dedicated group of volunteer monitors. To all we are very grateful.

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MONITORING AND EVALUATION OF CYANOBACTERIA IN LAKE CHAMPLAIN

Summer 2011

Appendices A - E

**Report to
Lake Champlain Basin Program**

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June 1, 2012

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Appendix A. Results of Qualitative Sample Screening - Data Summary 2011

Date	UVM Sample No.	Sample Location	BGA?	<i>Microcystis</i>	<i>Aphanizomenon</i>	<i>Gloeotrichia</i>	<i>Anabaena</i>	<i>Coelospherium</i>	<i>Oscillatoria</i>	Status
06/06/11	6202	North Beach shoreline	YES	X						Go to Quantitative
	6204	Red Rocks beach shoreline	YES	X						Go to Quantitative
06/07/11	6206	Rte 78 Access	YES	X						Go to Quantitative
06/08/11	6208	Alburgh	YES		X					Go to Quantitative
	6210	Highgate Cliffs	YES	X						Go to Quantitative
	6212	Highgate Springs	YES	X						Go to Quantitative
06/08/11	6214	Rock River Access	NO							Remain at Qualitative
	6215	Rock River Access	NO							Remain at Qualitative
	6216	St. Albans Boatlaunch	NO							Remain at Qualitative
	6217	St. Albans Boatlaunch	NO							Remain at Qualitative
	6218	VT DEC Sta 02	YES	X	X		X	X		Go to Quantitative
06/09/11	6219	VT DEC Sta 04	YES	X	X		X			Go to Quantitative
	6220	VT DEC Sta 25	YES	X	X		X			Go to Quantitative
	6221	VT DEC Sta 33	YES	X	X					Go to Quantitative
	6222	VT DEC Sta 36	YES		X					Go to Quantitative
06/15/11	6239	VT DEC Sta 46	YES	X	X		X			Go to Quantitative
	6240	VT DEC Sta 50	YES	X			X			Go to Quantitative
	6241	VT DEC Sta 07	YES	X						Go to Quantitative
	6242	VT DEC Sta 09	YES				X			Go to Quantitative
06/20/11	6243	VT DEC Sta 34	YES	X	X		X			Go to Quantitative
	6244	VT DEC Sta 40	YES	X	X		X			Go to Quantitative
	6245	VT DEC Sta 16	YES	X	X					Go to Quantitative
	6246	VT DEC Sta 19	YES	X	X		X			Go to Quantitative

	6247	VT DEC Sta 21	YES	X	X		X		Go to Quantitative
06/22/11	6231	Rock River Access	YES	X					Go to Quantitative
	6233	St. Albans Boatlaunch	NO						Remain at Qualitative
	6234	St. Albans Boatlaunch	YES		X				Go to Quantitative
06/28/11	6251	VT DEC Sta 51	YES	X	X		X		Go to Quantitative
07/05/11	6272	Chapman Bay	YES		X				Go to Quantitative
07/06/11	6273	Highgate Springs Shipyard	YES	X	X		X		Go to Quantitative
	6274	Donaldson Point	YES				X		Go to Quantitative
	6275	Maquam Bay	YES		X				Go to Quantitative
	6282	Rouses Point	NO						Remain at Qualitative
	6283	Begg's Park	NO						Remain at Qualitative
	6284	Shoreham / Larrabee's Point	YES		X		X		Go to Quantitative
	6285	Carry Bay	NO						Remain at Qualitative
	6286	Pelots Bay	NO						Remain at Qualitative
	6288	Point au Roche	NO						Remain at Qualitative
	6289	City Bay	NO						Remain at Qualitative
07/12/11	6302	Kingsland Bay / Ferrisburgh	YES		X				Go to Quantitative
	6303	North Hero State Park	YES				X		Go to Quantitative
	6305	Begg's Park	YES		X		X		Go to Quantitative
	6306	Point au Roche	YES		X		X		Go to Quantitative
	6307	Willsboro Bay	NO						Remain at Qualitative
	6308	Rouses Point	NO						Remain at Qualitative
	6309	City Bay	YES		X				Go to Quantitative

	6310	Pelots Bay	YES	X	X		X			Go to Quantitative
	6311	Carry Bay	YES		X					Go to Quantitative
	6320	Rock River Access	YES		X		X			Go to Quantitative
	6321	High Rocks	YES		X		X			Go to Quantitative
	6323	St. Albans Boatlaunch	YES		X		X			Go to Quantitative
07/19/11	6350	Rouses Point	NO							Remain at Qualitative
07/26/11	6385	Willsboro Bay	YES		X		X			Go to Quantitative
	6387	Rouses Point	NO							Remain at Qualitative
08/03/11	6423	Rouses Point	YES				X			Go to Quantitative

Appendix B. Counts of Algae in Quantitative Samples - Data Summary 2011

Location	Sample Type	Date	Rep	Count Rep	Bacillariophyceae	Chlorophyceae	Chrysophyceae	Cryptophyceae	Dinophyceae	Euglenophyceae	Myxophyceae	Potential Toxin Producers (cells/mL)	Total (cells/mL)	Collection Source
North Beach shoreline	counted ww as net	06/06/11	1	1	156.2		189.1	24.7					369.9	UVM
North Beach shoreline	counted ww as net	06/06/11	2	1	52.6	52.6	35.1	26.3					166.6	UVM
Red Rocks Beach shoreline	counted ww as net	06/06/11	1	1	61.4		43.8	8.8					114.0	UVM
Red Rocks Beach shoreline	counted ww as net	06/06/11	2	1	17.5		35.1						52.6	UVM
Rte 78 Access	net	06/07/11	1	1	5.9	0.3	72.3				1.7	1.7	80.2	UVM
Rte 78 Access	net	06/07/11	2	1	2.9	0.5	1.4						4.8	UVM
Alburgh	net	06/07/11	1	1	1.5		1.3			0.0	0.5	0.5	3.3	UVM
Alburgh	net	06/07/11	2	1	2.1	0.8	19.4						22.4	UVM
Highgate Cliffs	net	06/07/11	1	1	8.4	4.7	24.2		0.0	0.0	4.5	4.5	41.8	UVM
Highgate Cliffs	net	06/07/11	2	1	9.9	2.5	37.5				10.1	10.1	60.0	UVM
Highgate Springs	net	06/07/11	1	1	6.1	1.1	223.3						230.4	UVM

Highgate Springs	net	06/07/11	2	1	4.2	1.9	110.3				0.2	0.2	116.7	UVM
VTDEC Sta02	net	06/07/11	1	1	867.4	10.5					39.5	13.2	917.4	VT DEC
VTDEC Sta04	net	06/07/11	1	1	26.7	3.3	0.5	0.0	0.2	0.1	0.8	0.8	31.6	VT DEC
VTDEC Sta25	net	06/03/11	1	1	3.3		0.1	0.0	0.0		3.5	3.5	6.9	VT DEC
VTDEC Sta33	net	06/06/11	1	1	7.3		2.8	0.0			2.1	2.1	12.2	VT DEC
VTDEC Sta36	net	06/03/11	1	1	6.0	0.0	2.0	0.0			0.4	0.4	8.5	VT DEC
Rte 78 Access	net	06/21/11	1	1	384.2		11.3	1.2	0.6				397.3	UVM
Rte 78 Access	net	06/21/11	2	1	811.9	39.3	33.3						884.4	UVM
Alburgh	net	06/21/11	1	1	508.8	43.0	1.6				419.2	21.2	972.6	UVM
Alburgh	net	06/21/11	2	1	369.4		24.3						393.7	UVM
Highgate Cliffs	net	06/21/11	1	1	1463.8	27.8	80.9				65.0	65.0	1637.5	UVM
Highgate Cliffs	net	06/21/11	2	1	667.3	57.9	53.1				60.3	60.3	838.6	UVM
Highgate Springs	net	06/21/11	1	1	697.3	30.3	27.1				79.3	79.3	833.9	UVM
Highgate Springs	net	06/21/11	2	1	615.5	83.7	35.6			0.4	22.3		757.4	UVM
Rock River Access	counted ww as net	06/21/11	1	1	394.6	5173.6	675.2	17.5	35.1		438.4	438.4	6734.5	UVM
Rock River Access	counted ww as net	06/21/11	2	1	833.0	3849.5	1508.2	17.5	17.5		438.4	438.4	6664.3	UVM

St. Albans Boat Launch	counted ww as net	06/21/11	1	1	8.8		78.9	70.2					157.8	UVM
St. Albans Boat Launch	counted ww as net	06/21/11	2	1	8.8	8.8	78.9	43.8					140.3	UVM
North Beach shoreline	counted ww as net	06/20/11	1	1	175.4		35.1	61.4					271.8	UVM
North Beach shoreline	counted ww as net	06/20/11	2	1	8.8		8.8	43.8					61.4	UVM
Red Rocks Beach shoreline	counted ww as net	06/20/11	1	1	17.5			43.8					61.4	UVM
Red Rocks Beach shoreline	counted ww as net	06/20/11	2	1	26.3			26.3					52.6	UVM
VTDEC Sta46	net	06/08/11	1	1	5.3		0.5	0.1			2.3	2.3	8.2	VT DEC
VTDEC Sta50	net	06/08/11	1	1	7.6	2.5	17.9						27.9	VT DEC
VTDEC Sta07	net	06/13/11	1	1	19.8	0.2	0.2	0.1					20.2	VT DEC
VTDEC Sta09	net	06/13/11	1	1	20.0	0.8	0.9				5.5	5.5	27.2	VT DEC
VTDEC Sta34	net	06/14/11	1	1	4.0	0.7	0.3	0.0	0.0		2.5	2.5	7.5	VT DEC
VTDEC Sta40	net	06/14/11	1	1	13.9	0.1	0.2		0.0		2.6	2.6	16.8	VT DEC
VTDEC Sta16	net	06/17/11	1	1	16.0		0.3	0.2			0.3	0.3	16.8	VT DEC

VTDEC Sta19	net	06/17/11	1	1	14.9		0.3	0.0			0.1	0.1	15.3	VT DEC
VTDEC Sta21	net	06/17/11	1	1	13.2		0.5	0.2	0.0		2.4	2.4	16.4	VT DEC
VTDEC Sta25	net	06/20/11	1	1	2.5	0.0	2.1		0.0		42.3	42.3	46.9	VT DEC
VTDEC Sta04	net	06/21/11	1	1	267.0		10.9		6.7		38.2	34.7	322.8	VT DEC
VTDEC Sta02	net	06/21/11	1	1	214.0	23.5	70.8		0.3		78.4	78.4	387.0	VT DEC
VTDEC Sta51	net	06/22/11	1	1	1280.9		3.6	1.8			238.7	238.7	1525.0	VT DEC
VTDEC Sta50	net	06/22/11	1	1	654.6	84.0	46.7	1.1		0.5	712.7	64.3	1499.6	VT DEC
VTDEC Sta46	net	06/22/11	1	1	5.9	0.0	0.4	0.0	0.0				6.3	VT DEC
Rte 78 Access	net	07/05/11	1	1	287.9						1.5	1.5	289.4	UVM
Rte 78 Access	net	07/05/11	2	1	278.9								278.9	UVM
Alburgh	net	07/05/11	1	1	397.4	27.6	0.6				577.4	577.4	1003.0	UVM
Alburgh	net	07/05/11	2	1	324.9	27.8					349.9	349.9	702.6	UVM
Highgate Cliffs	net	07/05/11	1	1	608.0	65.3		1.2			4850.0	4850.0	5524.5	UVM
Highgate Cliffs	net	07/05/11	2	1	300.7	7.4	4.3				3101.2	3101.2	3413.6	UVM
Highgate Springs	net	07/05/11	1	1	333.0	7.0	8.8	1.2			1433.9	1433.9	1783.9	UVM
Highgate Springs	net	07/05/11	2	1	312.2		5.4				2711.4	2711.4	3029.0	UVM
St. Albans Boat Launch	net	07/05/11	1	1	97.2	229.9	87.9	4.7			94.9	94.9	514.4	UVM

St. Albans Boat Launch	net	07/05/11	2	1	264.8	195.1	18.4		0.6		39.7	39.7	518.6	UVM
Mallets Bay-NW shore near Sandbar Motel	counted ww as net	06/27/11	1	1		2800.0					2088000.0	2088000.0	2090800.0	VT DEC
VTDEC Sta33	net	06/27/11	1	1	2.3	1.0	0.7	0.2	0.0	0.0	12.3	12.3	16.5	VT DEC
VTDEC Sta36	net	06/27/11	1	1	6.6		0.3	0.0	0.0		1.0	1.0	7.9	VT DEC
VTDEC Sta07	net	06/28/11	1	1	152.8	0.1	0.3				8.7	8.7	161.9	VT DEC
VTDEC Sta09	net	06/28/11	1	1	51.2		0.1	0.1			2.5	2.5	53.9	VT DEC
VTDEC Sta16	net	06/29/11	1	1	247.5		1.7	0.2	0.2		29.1	29.1	278.6	VT DEC
VTDEC Sta19	net	06/29/11	1	1	45.5		0.5	0.2		0.0	1.3	1.3	47.5	VT DEC
VTDEC Sta21	net	06/29/11	1	1	90.0		1.2	0.4			64.9	64.9	156.5	VT DEC
Chapman Bay	counted ww as net	07/03/11	1	1	350.8		52.6	70.2			990.9	990.9	1464.4	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	07/03/11	1	1	1771.3	210.5	201.7	105.2			4805.3	4805.3	7094.0	Citizen Monitor
Donaldson Point	counted ww as net	07/03/11	1	1	1403.0	35.1	35.1	175.4			929.5	929.5	2578.0	Citizen Monitor

Maquam Bay	counted ww as net	07/05/11	1	1			203.7	76.4	17.0		687.4	687.4	984.4	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	07/05/11	1	1	375.8		52.6				676.5	676.5	1104.9	Citizen Monitor
North Beach shoreline	counted ww as net	07/05/11	1	1	868.1	140.3	192.9	149.1			736.6	736.6	2087.0	Citizen Monitor
VTDEC Sta34	net	06/30/11	1	1	28.8	1.6	15.4	0.1			4.5	4.5	50.6	VT DEC
VTDEC Sta40	net	06/30/11	1	1	28.2	28.0	25.2	0.2			20.4	20.4	102.0	VT DEC
VTDEC Sta02	net	07/05/11	1	1	24.2	19.5	14.0		0.2		132.7	132.7	190.6	VT DEC
VTDEC Sta04	net	07/05/11	1	1	31.7				1.6		2216.5	2216.5	2249.8	VT DEC
Larrabee's Point	counted ww as net	05-Jul-11	1	1		114.0	228.0				6366.2	6366.2	6708.2	Citizen Monitor
Rte 78 Access	net	07/12/11	1	1	84.7	0.1					589.0	580.8	673.8	UVM
Rte 78 Access	net	07/12/11	2	1	59.7	1.7	1.6				92.8	92.8	155.8	UVM
Alburgh - Shore	counted ww as net	07/12/11	1	1	43.8	35.1	140.3	578.7			964.6	964.6	1762.5	UVM
Alburgh - Shore	counted ww as net	07/12/11	2	1	157.8		96.5	35.1			1411.8	1411.8	1701.2	UVM
Highgate Cliffs	net	07/12/11	1	1	25.5				6.4		25553.7	25553.7	25585.6	UVM

Highgate Cliffs	net	07/12/11	2	1			6.4				19866.6	19866.6	19873.0	UVM
Highgate Springs	net	07/12/11	1	1					12.3		5471.6	5471.6	5483.9	UVM
Highgate Springs	net	07/12/11	2	1							4870.3	4870.3	4870.3	UVM
St. Albans Boat Launch	net	07/12/11	1	1	171.9	62.8	9.2		1.8		17435.2	3499.2	17681.1	UVM
St. Albans Boat Launch	net	07/12/11	2	1	103.5		37.0	1.8			10342.5	1099.9	10484.8	UVM
North Beach shoreline	counted ww as net	07/11/11	1	1	6497.7	43.8	96.5	96.5			26.3	26.3	6760.8	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	07/11/11	1	1	6818.7	84.2	84.2	31.6			2841.1	2841.1	9859.7	Citizen Monitor
Kingsland Bay Beach	counted ww as net	07/10/11	1	1	1446.9		61.4	78.9					1587.2	Citizen Monitor
North Hero State Park	counted ww as net	07/10/11	1	1	438.4		17.5	26.3			438.4	438.4	920.7	Citizen Monitor
Larrabee's Point	counted ww as net	07/10/11	1	1	149.1	298.1	43.8	17.5			1543.3	1543.3	2051.9	Citizen Monitor
Beggs Park	counted ww as net	07/10/11	1	1	1553.7	65.8	123.3	41.1		65.8			1849.7	Citizen Monitor

Point Au Roche State Park	counted ww as net	07/10/11	1	1	1429.3		52.6						1481.9	Citizen Monitor
City Bay	counted ww as net	07/10/11	1	1	35.1		96.5	8.8		26.3			166.6	Citizen Monitor
Pelots Bay	counted ww as net	07/10/11	1	1	613.8	368.3	342.0	105.2			201.7	201.7	1631.0	Citizen Monitor
Carry Bay	counted ww as net	07/10/11	1	1	534.9	17.5	96.5	78.9			534.9	534.9	1262.7	Citizen Monitor
VTDEC Sta25	net	07/07/11	1	1	6.8	3.4	3.7	0.2	0.8	0.1	31.0	31.0	45.9	VT DEC
VTDEC Sta46	net	07/08/11	1	1	326.3		1.0	0.3		0.3			328.0	VT DEC
VTDEC Sta50	net	07/08/11	1	1	185.8		1.6	0.3			489.5	489.5	677.1	VT DEC
VTDEC Sta51	net	07/08/11	1	1	102.7						2449.3	2387.7	2552.0	VT DEC
VTDEC Sta33	net	07/11/11	1	1	1771.5		1.9			0.6	282.4	282.4	2056.5	VT DEC
VTDEC Sta36	net	07/11/11	1	1	824.9		0.4				13.5	13.5	838.8	VT DEC
Chapman Bay	counted ww as net	07/10/11	1	1	17.5		26.3	70.2			166.6	166.6	280.6	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	07/10/11	1	1	280.6	833.0	534.9	131.5	114.0		166.6	166.6	2060.7	Citizen Monitor

Rock River Access	counted ww as net	07/10/11	1	1	43.8	184.1	631.4	78.9	35.1	8.8	7085.2	7085.2	8067.4	Citizen Monitor
High Rocks	counted ww as net	07/10/11	1	1	96.5	798.0	166.6	175.4	17.5		4323.1	4323.1	5577.0	Citizen Monitor
Donaldson Point	counted ww as net	07/10/11	1	1	438.4	87.7	824.3	236.8			263.1	263.1	1850.2	Citizen Monitor
St. Albans Bay Park	counted ww as net	07/10/11	1	1	315.7	1806.4	26.3			8.8	1385.5	1385.5	3542.6	Citizen Monitor
Maquam Bay	counted ww as net	07/11/11	1	1	52.6		35.1	8.8			385.8	385.8	482.3	Citizen Monitor
Melo Boat Slip	net	07/13/11	1	1	46.2						1990.3	1990.3	2036.5	UVM
Rte 78 Access	net	07/19/11	1	1	32.9	12.7	1.5	1.3			105.9	97.3	154.3	UVM
Rte 78 Access	net	07/19/11	2	1	100.1	60.1		1.7			1290.0	1290.0	1451.9	UVM
Alburgh	net	07/19/11	1	1	61.9	22.2		1.5			852.4	852.4	937.9	UVM
Alburgh	net	07/19/11	2	1	12.0		1.6				432.4	432.4	446.1	UVM
Highgate Cliffs	net	07/19/11	1	1	61.6				3.1		8188.9	8188.9	8253.6	UVM
Highgate Cliffs	net	07/19/11	2	1	92.4						5647.2	5647.2	5739.7	UVM
Highgate Springs	net	07/19/11	1	1	31.9						927.7	927.7	959.5	UVM
Highgate Springs	net	07/19/11	2	1	63.8	12.8					7395.8	7395.8	7472.3	UVM

St. Albans Boat Launch	net	07/19/11	1	1	149.8	14.9		0.2	3.5		118.3	115.5	286.6	UVM
St. Albans Boat Launch	net	07/19/11	2	1	160.5	7.7	0.3		2.7		59.2	59.2	230.4	UVM
VTDEC Sta07	net	07/13/11	1	1	520.3	27.0	24.9		0.7		3457.3	3457.3	4030.2	VT DEC
VTDEC Sta09	net	07/13/11	1	1	1017.7		3.1				2087.8	2087.8	3108.6	VT DEC
VTDEC Sta16	net	07/14/11	1	1	3388.4	7.6	0.9	0.9			304.0	304.0	3701.9	VT DEC
VTDEC Sta19	net	07/14/11	1	1	1574.3		1.0	1.0			25.7	25.7	1602.1	VT DEC
VTDEC Sta21	net	07/14/11	1	1	2184.9		6.2				73.9	73.9	2265.1	VT DEC
Red Rocks Beach shoreline	counted ww as net	07/18/11	1	1	201.7	43.8	35.1	131.5		8.8	87.7	87.7	508.6	Citizen Monitor
North Beach shoreline	counted ww as net	07/18/11	1	1	1867.8	8.8	43.8	35.1			131.5	131.5	2087.0	Citizen Monitor
City Bay	counted ww as net	07/18/11	1	1	491.1		114.0	26.3	8.8		114.0	114.0	754.1	Citizen Monitor
Pelots Bay	counted ww as net	07/18/11	1	1	1697.2	1154.1	186.7	8.5			212.2	212.2	3258.6	Citizen Monitor
Carry Bay	counted ww as net	07/18/11	1	1	2016.8	280.6	70.2				1569.6	1569.6	3937.2	Citizen Monitor

Beggs Park	counted ww as net	07/18/11	1	1	1385.5	8.8	96.5	166.6			1034.7	1034.7	2692.0	Citizen Monitor
Kingsland Bay Beach	counted ww as net	07/18/11	1	1	394.6	3218.2	87.7		8.8	78.9	1666.1	1666.1	5454.2	Citizen Monitor
Larrabee's Point	counted ww as net	07/18/11	1	1	96.5		70.2	8.8			1709.9	1709.9	1885.3	Citizen Monitor
Point Au Roche State Park	counted ww as net	07/18/11	1	1	1745.0	114.0	70.2	26.3					1955.5	Citizen Monitor
Rock River Access	counted ww as net	07/17/11	1	1	263.1	1078.6	447.2	131.5	315.7		18388.3	18388.3	20624.4	Citizen Monitor
High Rocks	counted ww as net	07/17/11	1	1	52.6	1420.6	122.8	157.8	245.5		5945.3	5945.3	7944.6	Citizen Monitor
Maquam Bay	counted ww as net	07/18/11	1	1	35.1		35.1	70.2	26.3		219.2	219.2	385.8	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	07/17/11	1	1	87.7	192.9	157.8				1324.1	1324.1	1762.5	Citizen Monitor
Donaldson Point	counted ww as net	07/17/11	1	1		578.7	228.0	166.6	43.8	17.5	1718.7	833.0	2753.4	Citizen Monitor
Chapman Bay	counted ww as net	07/17/11	1	1	26.3	8.8	26.3				929.5	929.5	990.9	Citizen Monitor

St. Albans Bay Park	counted ww as net	07/18/11	1	1	438.4	210.5		17.5			175.4	175.4	841.8	Citizen Monitor
Button Bay	net	07/13/11	1	1	530.2	12.2	39.4		1.1		474.1	474.1	1057.0	VT DEC
queska island	net	07/14/11	1	1	1692.8		6.8				68.4	68.4	1768.0	VT DEC
VTDEC Sta34	net	07/15/11	1	1	464.2	19.7	19.7		15.3		75.0	75.0	594.0	VT DEC
VTDEC Sta40	net	07/15/11	1	1	456.8	57.1	2.1		8.6		255.9	247.7	780.5	VT DEC
VTDEC Sta04	net	07/19/11	1	1	80.3	44.9	0.4	0.4	1.6	0.4	547.2	547.2	675.1	VT DEC
VTDEC Sta02	net	07/19/11	1	1	104.2	13.9	43.4	0.3	1.8	0.5	74.7	74.7	238.8	VT DEC
VTDEC Sta46	net	07/19/11	1	1	1122.5	1.0					15.4	15.4	1138.9	VT DEC
VTDEC Sta50	net	07/19/11	1	1	190.0	115.2					1607.8	1607.8	1912.9	VT DEC
VTDEC Sta51	net	07/19/11	1	1	413.3	496.0					7986.5	7986.5	8895.9	VT DEC
Rte 78 Access-shore	net	07/26/11	1	1	31.2	8.2	0.2	0.2			155.0	147.1	194.8	UVM
Rte 78 Access-shore	net	07/26/11	2	1	38.4	3.1			0.1		137.8	137.8	179.4	UVM
Alburgh - Shore	counted ww as net	07/26/11	1	1	17.5		43.8	78.9			5436.7	5436.7	5577.0	UVM
Alburgh - Shore	counted ww as net	07/26/11	2	1	43.8	280.6	43.8	35.1			2244.8	2244.8	2648.2	UVM

St. Albans Boat Launch	net	07/26/11	1	1	97.6				2.0		2444.9	2444.9	2544.4	UVM
St. Albans Boat Launch	net	07/26/11	2	1	35.7	1.8					396.1	396.1	433.6	UVM
Red Rocks Beach shoreline	counted ww as net	07/25/11	1	1	389.3	21.0	10.5	210.5			2946.3	2946.3	3577.7	Citizen Monitor
North Beach shoreline	counted ww as net	07/25/11	1	1	1017.2		17.5	70.2			1753.8	1753.8	2858.7	Citizen Monitor
North Hero State Park	counted ww as net	07/19/11	1	1	622.6	131.5	96.5	70.2	8.8		4858.0	4858.0	5787.5	Citizen Monitor
Beggs Park	counted ww as net	07/23/11	1	1	798.0	35.1	61.4	8.8			4551.0	4551.0	5454.2	Citizen Monitor
Kingsland Bay Beach	counted ww as net	07/23/11	1	1	823.1		59.4	17.0			704.3	704.3	1603.9	Citizen Monitor
Carry Bay	counted ww as net	07/24/11	1	1	964.6	315.7	26.3	35.1	8.8		17239.6	17239.6	18590.0	Citizen Monitor
Larrabee's Point	counted ww as net	07/24/11	1	1			96.5	8.8			2016.8	2016.8	2122.1	Citizen Monitor
North Hero State Park	counted ww as net	07/24/11	1	1	263.1			8.8			15257.8	1578.4	15529.7	Citizen Monitor

Willsboro Bay	counted ww as net	07/25/11	1	1	929.5	184.1	26.3	306.9			666.4	666.4	2113.3	Citizen Monitor
Point Au Roche State Park	counted ww as net	07/25/11	1	1	429.7	8.8	17.5	131.5			420.9	420.9	1008.4	Citizen Monitor
Pelots Bay	counted ww as net	07/25/11	1	1	271.8	499.8	8.8	17.5			2464.1	2464.1	3262.0	Citizen Monitor
City Bay	counted ww as net	07/25/11	1	1	789.2		17.5	96.5	8.8		964.6	964.6	1876.5	Citizen Monitor
Rock River Access	counted ww as net	07/25/11	1	1	8.8	333.2	1210.1	245.5	8.8		1894.1	1894.1	3700.5	Citizen Monitor
High Rocks	counted ww as net	07/25/11	1	1	263.1	210.5	175.4	140.3	17.5		2876.2	2876.2	3682.9	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	07/23/11	1	1	8.8	192.9	456.0	271.8	175.4		815.5	815.5	1920.4	Citizen Monitor
Donaldson Point	counted ww as net	07/24/11	1	1	43.8	70.2	26.3	17.5			824.3	824.3	982.1	Citizen Monitor
Maquam Bay	counted ww as net	07/26/11	1	1	4445.8	776.0	39.5	26.3			2617.5	1157.5	7905.1	Citizen Monitor
Chapman Bay	counted ww as net	07/24/11	1	1		17.5	131.5	543.7			438.4	438.4	1131.2	Citizen Monitor

St. Albans Bay Park	counted ww as net	07/25/11	1	1	271.8	903.2	52.6	43.8			12153.7	12153.7	13425.1	Citizen Monitor
Rte 78 Access	net	08/02/11	1	1			4.6	6.2			2076.5	2076.5	2087.3	UVM
Rte 78 Access	net	08/02/11	2	1			3.4	8.4			1106.5	1106.5	1118.3	UVM
Alburgh	net	08/02/11	1	1	0.8	10.6	0.1	0.2	0.1		497.0	492.1	508.8	UVM
Alburgh	net	08/02/11	2	1	1.2	9.3		0.2			103.9	103.9	114.6	UVM
Highgate Cliffs	net	08/02/11	1	1	11.5	22.4	0.6	0.6	0.6		4533.4	4523.0	4569.0	UVM
Highgate Cliffs	net	08/02/11	2	1		29.2	2.4	2.4			8599.0	8599.0	8633.0	UVM
Highgate Springs	net	08/02/11	1	1	19.9	14.8	0.6		1.3		3801.7	3795.2	3838.2	UVM
Highgate Springs	net	08/02/11	2	1							3960.6	3960.6	3960.6	UVM
St. Albans Boat Launch	net	08/02/11	1	1		134.1					8244.6	8244.6	8378.8	UVM
St. Albans Boat Launch	net	08/02/11	2	1		93.4					9219.3	9219.3	9312.7	UVM
VTDEC Sta25	net	07/22/11	1	1	4.5	5.9	10.9		0.3		50.9	50.9	72.4	VT DEC
VTDEC Sta07	net	07/28/11	1	1	902.5	5.5		1.4	2.8		953.6	953.6	1865.7	VT DEC
VTDEC Sta09	net	07/28/11	1	1	419.4	2.1			1.2		140.3	140.3	563.0	VT DEC
VTDEC Sta16	net	08/01/11	1	1	229.9	5.7	0.5		0.5		96.7	96.7	333.3	VT DEC
VTDEC Sta21	net	08/01/11	1	1	371.8				0.9		176.8	176.8	549.5	VT DEC

North Beach shoreline	counted ww as net	08/01/11	1	1	727.8		17.5				1587.2	1587.2	2332.5	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	08/01/11	1	1	8.8		52.6				438.4	438.4	499.8	Citizen Monitor
Willsboro Bay	counted ww as net	08/01/11	1	1	210.5	8.8	8.8	8.8	8.8		438.4	438.4	684.0	Citizen Monitor
Kingsland Bay Beach	counted ww as net	07/31/11	1	1	93.3	50.9	42.4	93.3			636.5	636.5	916.5	Citizen Monitor
Point Au Roche State Park	counted ww as net	08/01/11	1	1	157.8	43.8	35.1	8.8			2051.9	2051.9	2297.4	Citizen Monitor
Larrabee's Point	counted ww as net	07/31/11	1	1	61.4	8.8	114.0	17.5					201.7	Citizen Monitor
Beggs Park	counted ww as net	07/31/11	1	1	377.1		8.8	26.3			219.2	219.2	631.4	Citizen Monitor
North Hero State Park	counted ww as net	07/31/11	1	1	105.2						1753.8	1753.8	1859.0	Citizen Monitor
City Bay	counted ww as net	08/01/11	1	1			17.5	17.5			561.2	561.2	596.3	Citizen Monitor
Carry Bay	counted ww as net	07/31/11	1	1	534.9	43.8	52.6	122.8			2192.2	2192.2	2946.3	Citizen Monitor

Pelots Bay	counted ww as net	08/01/11	1	1	263.1	87.7	43.8	149.1	17.5	8.8	15564.7	15564.7	16134.7	Citizen Monitor
Rouses Point	counted ww as net	08/01/11	1	1	17.5		17.5	35.1					70.2	Citizen Monitor
Donaldson Point	counted ww as net	07/31/11	1	1	52.6		8.8	149.1					210.5	Citizen Monitor
Highgate Springs- Shipyards	counted ww as net	07/31/11	1	1	17.5	43.8	254.3	61.4	26.3		438.4	438.4	841.8	Citizen Monitor
Maquam Bay	counted ww as net	08/01/11	1	1	59.4	33.9	25.5	93.3					212.2	Citizen Monitor
High Rocks	counted ww as net	08/01/11	1	1	133.3						56400.0	52400.0	56533.3	Citizen Monitor
Rock River Access	counted ww as net	08/01/11	1	1	266666.7		666.7				120000.0	120000.0	387333.3	Citizen Monitor
St. Albans Bay Park	counted ww as net	08/01/11	1	1	457.1						81028.6	78742.9	81485.7	Citizen Monitor
Chapman Bay	counted ww as net	07/31/11	1	1	26.3	43.8	131.5	61.4					263.1	Citizen Monitor
Rte 78 Access	counted ww as net	08/09/11	1	1	482.3	122.8	35.1	26.3	8.8		28612.8	28612.8	29288.0	UVM

Rte 78 Access	counted ww as net	08/09/11	2	1	96.5	70.2	43.8	149.1	8.8		32357.1	32357.1	32725.4	UVM
Alburgh	counted ww as net	08/09/11	1	1	43.8	17.5	78.9	131.5			263.1	263.1	534.9	UVM
Alburgh	counted ww as net	08/09/11	2	1				35.1			789.2	789.2	824.3	UVM
Highgate Cliffs	counted ww as net	08/09/11	1	1			87.7	26.3	26.3		41161.1	41161.1	41301.4	UVM
Highgate Cliffs	counted ww as net	08/09/11	2	1		499.8	87.7	52.6			27350.1	27350.1	27990.2	UVM
Highgate Springs	counted ww as net	08/09/11	1	1	266.7		133.3				1039733.3	1039733.3	1040133.3	UVM
Highgate Springs	counted ww as net	08/09/11	2	1							603733.3	601600.0	603733.3	UVM
St. Albans Boat Launch	counted ww as net	08/09/11	1	1	10.5	147.3	42.1	115.7			20340.3	20340.3	20655.9	UVM
St. Albans Boat Launch	counted ww as net	08/09/11	2	1	8.8	219.2	26.3	157.8			11671.4	11601.2	12083.5	UVM
Red Rocks Beach shoreline	counted ww as net	08/08/11	1	1	184.1		43.8	52.6			1052.3	1052.3	1332.9	Citizen Monitor

North Beach shoreline	counted ww as net	08/08/11	1	1	1517.0	8.8	87.7	1069.8	17.5		184.1	184.1	2885.0	Citizen Monitor
Kingsland Bay Beach	counted ww as net	08/07/11	1	1	8.8	43.8	43.8	271.8			1148.7	1148.7	1517.0	Citizen Monitor
Beggs Park	counted ww as net	08/07/11	1	1		122.8	35.1	35.1			1148.7	1148.7	1341.6	Citizen Monitor
Larrabee's Point	counted ww as net	08/07/11	1	1	131.5	70.2	17.5			52.6	1315.3	1315.3	1587.2	Citizen Monitor
Willsboro Bay	counted ww as net	08/08/11	1	1	745.4	280.6	8.8	8.8			5068.4	859.3	6111.9	Citizen Monitor
Rouses Point	counted ww as net	08/08/11	1	1		315.7	43.8	96.5					456.0	Citizen Monitor
Pelots Bay	counted ww as net	08/08/11	1	1	824.3	394.6	35.1	52.6		8.8	12451.8	12451.8	13767.1	Citizen Monitor
Carry Bay	counted ww as net	08/07/11	1	1	184.1	245.5	8.8	228.0			87.7	87.7	754.1	Citizen Monitor
North Hero State Park	counted ww as net	08/07/11	1	1	824.3	8.8		8.8			2639.4	2639.4	3481.2	Citizen Monitor
City Bay	counted ww as net	08/08/11	1	1	350.8	105.2	52.6	359.5			271.8	271.8	1140.0	Citizen Monitor

Point Au Roche State Park	counted ww as net	08/08/11	1	1	1061.0	245.5	17.5	131.5	52.6				1508.2	Citizen Monitor
Rock River Access	counted ww as net	08/07/11	1	1	800.0		1600.0			400.0	90533.3	90533.3	93333.3	Citizen Monitor
High Rocks	counted ww as net	08/07/11	1	1			600.0				426000.0	426000.0	426600.0	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	08/07/11	1	1	129.0				129.0		579871.0	579871.0	580129.0	Citizen Monitor
Chapman Bay	counted ww as net	08/07/11	1	1		149.1	43.8	26.3			2849.9	2849.9	3069.1	Citizen Monitor
St. Albans Bay Park	counted ww as net	08/08/11	1	1	59.4	1451.1	127.3	203.7			7849.6	7849.6	9691.0	Citizen Monitor
Maquam Bay	counted ww as net	08/09/11	1	1	43.8	87.7	35.1	87.7			613.8	613.8	868.1	Citizen Monitor
Donaldson Point	counted ww as net	08/07/11	1	1	52.6	35.1	131.5	131.5			333.2	333.2	684.0	Citizen Monitor
VTDEC Sta33	net	08/08/11	1	1	452.1	0.4	0.7	5.7	0.9		308.6	308.6	768.3	VT DEC
VTDEC Sta36	net	08/08/11	1	1	708.9						291.1	291.1	1000.0	VT DEC
VTDEC Sta34	net	08/09/11	1	1	92.0	17.5	0.2	0.2			1468.1	1454.4	1578.1	VT DEC
VTDEC	net	08/09/11	1	1		15.0					1639.6	1639.6	1654.6	VT DEC

Sta40														
Rte 78 Access	net	08/16/11	1	1	30.4	28.4			2.0		3930.7	3900.3	3991.6	UVM
Rte 78 Access	net	08/16/11	2	1	16.6			3.3			2825.1	2825.1	2844.9	UVM
Alburgh	net	08/16/11	1	1	1.0	25.4		0.5			616.1	616.1	643.0	UVM
Alburgh	net	08/16/11	2	1	11.7						339.5	339.5	351.2	UVM
Highgate Cliffs	net	08/16/11	1	1			0.7				3923.5	3923.5	3924.2	UVM
Highgate Cliffs	net	08/16/11	2	1	28.5			0.9			2588.6	2588.6	2618.0	UVM
Highgate Springs	net	08/16/11	1	1			6.3				9318.8	9318.8	9325.2	UVM
Highgate Springs	net	08/16/11	2	1							11392.8	11392.8	11392.8	UVM
St. Albans Boat Launch	net	08/16/11	1	1	367.4	102.1	2.0				2281.9	1363.4	2753.4	UVM
St. Albans Boat Launch	net	08/16/11	2	1	439.4	58.6					1326.6	1326.6	1824.6	UVM
North Beach shoreline	counted ww as net	08/15/11	1	1		87.7	70.2	324.4	17.5		771.7	727.8	1271.5	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	08/15/11	1	1			43.8	263.1					306.9	Citizen Monitor
Point Au Roche State Park	counted ww as net	08/15/11	1	1	87.7		17.5	184.1			771.7	771.7	1061.0	Citizen Monitor

Kingsland Bay Beach	counted ww as net	08/14/11	1	1			8.8	78.9			1894.1	1894.1	1981.8	Citizen Monitor
Rouses Point	counted ww as net	08/15/11	1	1	26.3		35.1	87.7					149.1	Citizen Monitor
Larrabee's Point	counted ww as net	08/14/11	1	1		78.9	8.8				929.5	929.5	1017.2	Citizen Monitor
Beggs Park	counted ww as net	08/14/11	1	1	17.5		8.8	17.5			1973.0	1973.0	2016.8	Citizen Monitor
City Bay	counted ww as net	08/15/11	1	1	87.7		17.5	43.8			605.1	605.1	754.1	Citizen Monitor
Willsboro Bay	counted ww as net	08/15/11	1	1	87.7		184.1	228.0			912.0	912.0	1411.8	Citizen Monitor
North Hero State Park	counted ww as net	08/14/11	1	1	1332.9	508.6		17.5			6866.0	6866.0	8725.0	Citizen Monitor
Pelots Bay	counted ww as net	08/15/11	1	1	377.1	131.5	26.3	96.5			2376.4	2376.4	3007.7	Citizen Monitor
Carry Bay	counted ww as net	08/14/11	1	1	526.1	140.3	17.5	70.2			1806.4	1806.4	2560.5	Citizen Monitor
St. Albans Bay Park	counted ww as net	08/15/11	1	1	824.3	798.0	745.4	280.6	8.8		3709.2	3463.7	6366.2	Citizen Monitor

Chapman Bay	counted ww as net	08/14/11	1	1	8.8		26.3	52.6					87.7	Citizen Monitor
High Rocks	counted ww as net	08/15/11	1	1	8.8		43.8	17.5			640.1	640.1	710.3	Citizen Monitor
Rock River Access	counted ww as net	08/15/11	1	1	26.3	35.1	17.5				228.0	228.0	306.9	Citizen Monitor
Maquam Bay	counted ww as net	08/16/11	1	1	8.8		8.8	43.8			438.4	438.4	499.8	Citizen Monitor
Donaldson Point	counted ww as net	08/15/11	1	1	87.7	8.8	52.6	35.1			990.9	990.9	1175.0	Citizen Monitor
Highgate Springs- Shipyards	counted ww as net	08/14/11	1	1	8.8	149.1	306.9	131.5	17.5		2499.1	2499.1	3112.9	Citizen Monitor
VTDEC Sta02	net	08/11/11	1	1	332.2	38.7	23.4		1.7		68.7	68.7	464.7	VT DEC
VTDEC Sta04	net	08/11/11	1	1	1629.0	98.5	2.0		2.0		168.9	168.9	1900.5	VT DEC
VTDEC Sta46	net	08/12/11	1	1	43.1	4.9	0.2		0.2		504.9	504.9	553.3	VT DEC
VTDEC Sta50	net	08/12/11	1	1	17.5						2361.4	2361.4	2378.9	VT DEC
VTDEC Sta51	net	08/12/11	1	1							3109.4	3109.4	3109.4	VT DEC
Rte 78 Access	net	08/23/11	1	1	90.3				2.9		19244.5	19157.1	19337.6	UVM
Rte 78 Access	net	08/23/11	1	2	7.3						6699.9	6699.9	6707.2	UVM

Rte 78 Access	net	08/23/11	2	1							6234.6	6234.6	6234.6	UVM
Alburgh	net	08/23/11	1	1	7.0	5.4			1.8		1249.4	1249.4	1263.6	UVM
Highgate Cliffs	net	08/23/11	1	1							6912.7	6912.7	6912.7	UVM
Highgate Cliffs	net	08/23/11	1	2	12.8	6.4					2575.5	2575.5	2594.7	UVM
Highgate Cliffs	net	08/23/11	2	1	23.3			1.2			1700.6	1700.6	1725.1	UVM
Highgate Springs	net	08/23/11	1	1					6.9		10803.0	10803.0	10809.9	UVM
Highgate Springs	net	08/23/11	2	1				8.6			10683.4	10683.4	10692.1	UVM
St. Albans Boat Launch	net	08/23/11	1	1	1920.1	29.5					8046.0	3430.3	9995.6	UVM
St. Albans Boat Launch	net	08/23/11	2	1	1336.0						3942.6	3942.6	5278.6	UVM
Donaldson Point	counted ww as net	08/18/11	1	1	73.7	399.9	357.8	10.5	10.5		17046.7	17046.7	17899.0	UVM
VTDEC Sta25	net	08/17/11	1	1	16.5	0.8	1.0	0.1	0.3	0.1	32.7	32.7	51.4	VT DEC
VTDEC Sta07	net	08/18/11	1	1	514.9	132.1	40.4				8095.4	8095.4	8782.8	VT DEC
VTDEC Sta09	net	08/18/11	1	1	105.3	42.1	2.6				9250.0	9250.0	9400.0	VT DEC
Northwest Bay	net	08/18/11	1	1							5774.3	5774.3	5774.3	VT DEC
VTDEC Sta16	net	08/19/11	1	1	50.1	10.7	0.4	0.4	1.2		1236.9	1236.9	1299.7	VT DEC
VTDEC	net	08/19/11	1	1	61.6						5052.6	5052.6	5114.2	VT DEC

Sta19														
VTDEC Sta21	net	08/19/11	1	1	43.2	1.1			2.1		3672.6	3672.6	3718.9	VT DEC
St. Albans Bay Park	counted ww as net	08/21/11	1	1	263.1	2315.0	65.8	26.3			13429.5	13429.5	16099.6	Citizen Monitor
North Beach	counted ww as net	08/22/11	1	1	17.5		26.3	17.5			7400.9	7400.9	7462.3	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	08/22/11	1	1	17.5	70.2					876.9	876.9	964.6	Citizen Monitor
Larrabee's Point	counted ww as net	08/21/11	1	1	87.7	8.8					657.7	657.7	754.1	Citizen Monitor
Beggs Park	counted ww as net	08/21/11	1	1	8.8						1034.7	1034.7	1043.5	Citizen Monitor
Pelots Bay	counted ww as net	08/21/11	1	1	754.1	201.7	35.1	87.7			175.4	175.4	1253.9	Citizen Monitor
Point Au Roche State Park	counted ww as net	08/21/11	1	1			35.1	35.1	26.3		605.1	605.1	701.5	Citizen Monitor
Rouses Point	counted ww as net	08/21/11	1	1			26.3	78.9					105.2	Citizen Monitor
Willsboro Bay	counted ww as net	08/21/11	1	1	8.8	271.8	17.5	26.3			4068.8	3805.7	4393.2	Citizen Monitor

Carry Bay	counted ww as net	08/21/11	1	1	517.4	70.2	17.5	26.3			1736.2	1736.2	2367.6	Citizen Monitor
City Bay	counted ww as net	08/21/11	1	1			52.6	52.6			333.2	333.2	438.4	Citizen Monitor
Kingsland Bay Beach	counted ww as net	08/21/11	1	1	122.8		17.5	122.8			6629.3	6629.3	6892.3	Citizen Monitor
North Hero State Park	counted ww as net	08/21/11	1	1	87.7			8.8			11846.7	11846.7	11943.2	Citizen Monitor
Dunham Bay	counted ww as net	08/22/11	1	1							79333.3	79333.3	79333.3	Citizen Monitor
Donaldson Point	counted ww as net	08/22/11	1	1	131.5	245.5	96.5	201.7			491.1	491.1	1166.3	Citizen Monitor
Highgate Springs- Shipyard	counted ww as net	08/21/11	1	1	96.5	122.8	552.4	78.9	26.3		3183.1	3183.1	4060.0	Citizen Monitor
Rock River Access	counted ww as net	08/22/11	1	1			8.8				438.4	438.4	447.2	Citizen Monitor
High Rocks	counted ww as net	08/22/11	1	1	87.7	482.3	87.7		61.4		8269.0	8269.0	8988.1	Citizen Monitor
Maquam Bay	counted ww as net	08/22/11	1	1	8.8	35.1		8.8	8.8		491.1	491.1	552.4	Citizen Monitor

Chapman Bay	counted ww as net	08/21/11	1	1	8.8	35.1		8.8	8.8				61.4	Citizen Monitor
VTDEC Sta02	net	08/22/11	1	1	57.7				0.8		823.6	823.6	882.1	VT DEC
VTDEC Sta04	net	08/22/11	1	1	548.3	22.1			3.7		303.6	303.6	877.7	VT DEC
VTDEC Sta34	net	08/23/11	1	1	70.2	10.7	0.2		1.1		2945.6	1062.8	3027.8	VT DEC
VTDEC Sta40	net	08/23/11	1	1	698.3	16.4			2.1		706.5	706.5	1423.4	VT DEC
Rte 78 Access	net	08/30/11	1	1	76.4		1.5		1.5		2845.9	2845.9	2925.3	UVM
Rte 78 Access	net	08/30/11	2	1	115.0	19.7					2371.0	2371.0	2505.8	UVM
Alburgh - Shore	counted ww as net	08/30/11	1	1		438.4	157.8				6120.7	6120.7	6717.0	UVM
Alburgh - Shore	counted ww as net	08/30/11	1	2	17.5	105.2	114.0	17.5			324.4	8.8	578.7	UVM
Alburgh - Shore	counted ww as net	08/30/11	2	1	8.8	999.7	26.3	8.8					1043.5	UVM
St. Albans Boat Launch	net	08/30/11	1	1	52.8		0.1		0.1		215.1	215.1	268.2	UVM
St. Albans Boat Launch	net	08/30/11	2	1	431.8	36.1					1647.9	1647.9	2115.8	UVM

Red Rocks Beach shoreline	counted ww as net	08/29/11	1	1	8.8		17.5	26.3			7497.4	7497.4	7550.0	Citizen Monitor
North Beach shoreline	counted ww as net	08/29/11	1	1							6006.7	6006.7	6006.7	Citizen Monitor
St. Albans Bay Park	counted ww as net	08/29/11	1	1	631.4	420.9	43.8				1175.0	1175.0	2271.1	Citizen Monitor
Donaldson Point	counted ww as net	08/27/11	1	1	17.5	210.5					11425.8	11425.8	11653.8	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	08/29/11	1	1	26.3	26.3	35.1						87.7	Citizen Monitor
Chapman Bay	counted ww as net	08/29/11	1	1		52.6	35.1				263.1	263.1	350.8	Citizen Monitor
City Bay	counted ww as net	08/29/11	1	1	8.8			8.8			2630.7	2630.7	2648.2	Citizen Monitor
Pelots Bay	counted ww as net	08/29/11	1	1	822.1	197.3	82.2	16.4			34461.6	34461.6	35579.7	Citizen Monitor
Carry Bay	counted ww as net	08/29/11	1	1	228.0	140.3	17.5				166.6	166.6	552.4	Citizen Monitor
Point Au Roche State Park	counted ww as net	08/29/11	1	1	8.8		17.5	17.5			5208.7	5208.7	5252.6	Citizen Monitor

Rouses Point	counted ww as net	08/29/11	1	1	8.8				8.8				17.5	Citizen Monitor
Rte 78 Access-shore	counted ww as net	09/06/11	1	1	17.5	201.7	43.8	114.0	8.8		6313.6	2630.7	6699.4	UVM
Rte 78 Access-shore	counted ww as net	09/06/11	2	1	201.7		105.2	61.4	8.8		2595.6	2595.6	2972.6	UVM
Alburgh - Shore	counted ww as net	09/06/11	1	1	17.5	175.4	78.9	26.3			1850.2	1850.2	2148.4	UVM
Alburgh - Shore	counted ww as net	09/06/11	2	1		578.7	70.2	52.6			3244.5	3244.5	3946.0	UVM
St. Albans Boat Launch	net	09/06/11	1	1	715.9	110.1	2.1	4.2			1321.7	1321.7	2154.1	UVM
St. Albans Boat Launch	net	09/06/11	2	1	260.7	161.6			2.2		1744.9	452.4	2169.3	UVM
VTDEC Sta25	net	09/01/11	1	1	106.2	0.5	42.4	0.9	0.4		19.0	19.0	169.3	VT DEC
VTDEC Sta33	net	09/01/11	1	1					1.5		2462.1	2462.1	2463.6	VT DEC
VTDEC Sta36	net	09/01/11	1	1	9.0						1573.3	1573.3	1582.3	VT DEC
VTDEC Sta09	net	09/02/11	1	1	95.0				1.6		2689.9	2689.9	2786.5	VT DEC
VTDEC Sta07	net	09/02/11	1	1	101.5				0.1		256.7	256.7	358.3	VT DEC

Donaldson Point	counted ww as net	09/04/11	1	1	26.3	894.4	140.3	8.8	17.5		657.7	657.7	1745.0	Citizen Monitor
Highgate Springs-Shipyard	counted ww as net	09/04/11	1	1	8.8	105.2	166.6	87.7	17.5				385.8	Citizen Monitor
North Beach shoreline	counted ww as net	09/06/11	1	1	263.1	35.1	61.4	61.4					420.9	Citizen Monitor
Red Rocks Beach shoreline	counted ww as net	09/06/11	1	1	8.8		17.5				1148.7	1148.7	1175.0	Citizen Monitor
North Hero State Park	counted ww as net	08/29/11	1	1	105.2						14056.5	14056.5	14161.7	Citizen Monitor
Beggs Park	counted ww as net	08/29/11	1	1	87.7	17.5	8.8	70.2			3902.1	3902.1	4086.3	Citizen Monitor
Beggs Park	counted ww as net	09/03/11	1	1							491.1	491.1	491.1	Citizen Monitor
Kingsland Bay Beach	counted ww as net	09/04/11	1	1		140.3	631.4	105.2		578.7	657.7	657.7	2113.3	Citizen Monitor
North Hero State Park	counted ww as net	09/04/11	1	1	438.4		8.8		8.8		114.0	114.0	570.0	Citizen Monitor
Larrabee's Point	counted ww as net	09/04/11	1	1	114.0		114.0		26.3	210.5	333.2	333.2	798.0	Citizen Monitor

Carry Bay	counted ww as net	09/05/11	1	1	377.1	96.5	157.8	157.8	35.1		2244.8	2244.8	3069.1	Citizen Monitor
Willsboro Bay	counted ww as net	09/06/11	1	1	8.8		8.8	78.9			1481.9	1481.9	1578.4	Citizen Monitor
Point Au Roche State Park	counted ww as net	09/06/11	1	1			61.4	17.5	105.2		219.2	219.2	403.4	Citizen Monitor
Rouses Point	counted ww as net	09/06/11	1	1	8.8		8.8	17.5	8.8	8.8	771.7	771.7	824.3	Citizen Monitor
City Bay	counted ww as net	09/06/11	1	1	87.7	43.8	52.6	26.3	8.8				219.2	Citizen Monitor
Pelots Bay	counted ww as net	09/06/11	1	1	2306.2	35.1	105.2	105.2		8.8	1429.3	1429.3	3989.8	Citizen Monitor
VTDEC Sta16	net	09/07/11	1	1	17.4		3.3	0.3	2.4		95.3	95.3	118.6	VT DEC
VTDEC Sta19	net	09/07/11	1	1	17.5		0.5		0.3		181.7	181.7	200.0	VT DEC
VTDEC Sta21	net	09/07/11	1	1	37.0	3.2		0.4	0.6		148.1	148.1	189.4	VT DEC
Rte 78 Access	net	09/13/11	1	1	149.8	7.6			0.3		553.0	553.0	710.7	UVM
Rte 78 Access	net	09/13/11	2	1	122.2	32.1			0.5		388.6	380.1	543.4	UVM
Alburgh	counted ww as net	09/13/11	1	1	96.5	105.2	131.5	114.0			52.6	52.6	499.8	UVM

Alburgh	counted ww as net	09/13/11	2	1	96.5	105.2	342.0	26.3	8.8	8.8	990.9	990.9	1578.4	UVM
Highgate Springs- Shipyard	counted ww as net	09/13/11	1	1		17.5	35.1	17.5			438.4	438.4	508.6	UVM
Highgate Springs- Shipyard	counted ww as net	09/13/11	2	1	105.2	43.8	70.2	52.6	70.2	8.8	1157.5		1508.2	UVM
St. Albans Boat Launch	counted ww as net	09/13/11	1	1	385.8	859.3	52.6	35.1			1718.7	1718.7	3051.6	UVM
St. Albans Boat Launch	counted ww as net	09/13/11	2	1	719.0	61.4	96.5	26.3			1403.0	1403.0	2306.2	UVM
VTDEC Sta34	net	09/09/11	1	1	78.6	14.5	0.5		1.0		544.9	532.6	639.6	VT DEC
VTDEC Sta40	net	09/09/11	1	1	644.5	92.4	0.6		0.6		777.0	777.0	1515.2	VT DEC
Holiday Point	net	09/09/11	1	1	50.6		1.3				941.2	941.2	993.1	VT DEC
VTDEC Sta46	net	09/12/11	1	1	28.3		7.5	0.7	1.3		133.7	133.7	171.6	VT DEC
VTDEC Sta50	net	09/12/11	1	1	33.1		0.3			0.3	1928.6	1912.0	1962.2	VT DEC
VTDEC Sta51	net	09/12/11	1	1	77.0	48.1	1.0		1.0		3204.1	3197.4	3331.2	VT DEC
VTDEC Sta25	net	09/13/11	1	1	160.4		2.5	0.2	0.3		55.6	55.6	218.9	VT DEC
Rte 78 Access- shore	counted ww as net	09/20/11	1	1	8.8		35.1	61.4	43.8		394.6	394.6	543.7	UVM

Rte 78 Access-shore	counted ww as net	09/20/11	2	1	403.4	122.8	245.5	131.5	52.6	8.8	8882.9	8768.9	9847.4	UVM
Alburgh - Shore	counted ww as net	09/20/11	1	1	228.0	35.1	271.8	17.5	8.8		10952.3	10952.3	11513.5	UVM
Alburgh - Shore	counted ww as net	09/20/11	2	1	17.5	192.9	70.2	105.2			6339.9	6339.9	6725.7	UVM
Highgate Cliffs	counted ww as net	09/20/11	1	1	175.4		87.7	35.1	8.8		23220.0	23220.0	23526.9	UVM
Highgate Cliffs	counted ww as net	09/20/11	2	1	8.8		122.8	43.8	43.8		10961.1	10961.1	11180.3	UVM
Highgate Springs	counted ww as net	09/20/11	1	1	885.7		368.3	122.8	175.4	8.8	5129.8	5077.2	6690.6	UVM
Highgate Springs	counted ww as net	09/20/11	2	1	719.0	570.0	368.3	70.2	166.6	8.8	10610.3	10610.3	12513.2	UVM
St. Albans Boat Launch	net	09/20/11	1	1	114.0	6.3	0.9		2.0	0.2	891.0	886.5	1014.5	UVM
St. Albans Boat Launch	net	09/20/11	2	1	107.1	30.1	1.6		3.0		584.7	575.3	726.5	UVM
Highgate Springs-Shipyard	counted ww as net	09/18/11	1	1	10.5	115.7	157.8				58421.7	57664.1	58705.8	Citizen Monitor

Dunham Bay	counted ww as net	09/21/11	1	1	657.7	52.6	78.9	35.1	78.9		8619.8	8619.8	9523.0	Citizen Monitor
VTDEC Sta02	net	09/14/11	1	1	80.8		4.3			0.1	5.0	5.0	90.2	VT DEC
VTDEC Sta04	net	09/14/11	1	1	94.4	4.9	9.3	0.1	0.3	0.1	18.7	16.9	127.9	VT DEC
VTDEC Sta33	net	09/19/11	1	1	26.2		14.1	0.5	0.8		77.2	77.2	118.9	VT DEC
VTDEC Sta36	net	09/19/11	1	1	30.3		0.5	0.4	0.3		61.8	61.8	93.2	VT DEC
VTDEC Sta07	net	09/21/11	1	1	583.4		0.7	0.7					584.9	VT DEC
VTDEC Sta09	net	09/21/11	1	1	476.5		0.8	0.8			34.8	34.8	513.0	VT DEC
Rte 78 Access	net	09/27/11	1	1	590.9	54.6			4.3		575.1	575.1	1225.0	UVM
Rte 78 Access	net	09/27/11	2	1	504.0	24.0	10.4				1192.1	1192.1	1730.6	UVM
Alburgh	net	09/27/11	2	1	191.0	12.1	1.1				1428.6	1388.3	1632.7	UVM
Highgate Cliffs	net	09/27/11	1	1	838.0		2.5				834.9	834.9	1675.4	UVM
Highgate Cliffs	net	09/27/11	2	1	658.8	8.4	0.5	0.5			177.0	177.0	845.2	UVM
Highgate Springs	net	09/27/11	1	1	496.7	16.8	8.4		0.7		462.4	446.3	984.9	UVM
Highgate Springs	net	09/27/11	2	1	608.2		1.2		0.6	1.2	1136.2	1136.2	1747.5	UVM
St. Albans Boat Launch	net	09/27/11	1	1							9531.7	9531.7	9531.7	UVM
St. Albans Boat	net	09/27/11	2	1							12734.5	12734.5	12734.5	UVM

Launch														
VTDEC Sta16	net	09/22/11	1	1	86.0		1.4	0.4	0.4	0.2	101.6	101.6	189.8	VT DEC
VTDEC Sta19	net	09/23/11	1	1	108.1	10.9	4.4		0.8		154.8	154.8	279.1	VT DEC
VTDEC Sta21	net	09/22/11	1	1	126.0	13.9	2.9	0.1	0.3		167.5	166.5	310.8	VT DEC
Highgate Springs-Shipyard	counted ww as net	09/25/11	1	1	350.8				175.4	175.4	943530.1	940548.7	944231.6	Citizen Monitor
VTDEC Sta46	net	09/26/11	1	1	20.7		5.7	0.2	0.2		7.0	7.0	33.7	VT DEC
VTDEC Sta50	net	09/26/11	1	1	179.5	2.6	0.5	1.5	0.2		273.0	254.3	457.2	VT DEC
VTDEC Sta51	net	09/26/11	1	1	313.0	11.6	1.3	0.2	0.2		379.4	363.4	705.6	VT DEC
VTDEC Sta02	net	09/27/11	1	1	47.0	0.2	52.0	0.8	0.5		19.3	17.9	119.8	VT DEC
VTDEC Sta04	net	09/27/11	1	1	383.3	21.8	2.0		1.2		32.6	26.7	440.9	VT DEC
VTDEC Sta34	net	09/28/11	1	1	24.1	4.5	0.3		0.2	0.2	410.5	393.2	439.8	VT DEC
VTDEC Sta40	net	09/28/11	1	1	5.4	2.0	0.2		0.8		600.3	600.3	608.8	VT DEC
North Hero House dock	counted ww as net	09/28/11	1	1		70.2	131.5		43.8	8.8			254.3	UVM
Rte 78 Access	net	10/04/11	1	1	580.7		4.5		4.5		4000.4	4000.4	4590.1	UVM
Rte 78 Access	net	10/04/11	2	1	291.1			2.4	2.4		5247.8	5247.8	5543.8	UVM

Alburgh	net	10/04/11	1	1	76.6			0.1	0.7		293.3	287.1	370.7	UVM
Alburgh	net	10/04/11	2	1	64.8		0.1	0.1	0.9		192.3	192.3	258.2	UVM
Highgate Cliffs	net	10/04/11	1	1	684.6		16.0		1.1		124.1	123.0	825.8	UVM
Highgate Cliffs	net	10/04/11	2	1	589.4		0.6		1.9		193.0	193.0	784.9	UVM
Highgate Springs	net	10/04/11	1	1	732.2		0.6				1055.2	1055.2	1788.0	UVM
Highgate Springs	net	10/04/11	2	1	770.7		0.5				514.1	514.1	1285.4	UVM
St. Albans Boat Launch	net	10/04/11	1	1	189.3	3.5	0.3		0.1		85.9	85.3	279.1	UVM
St. Albans Boat Launch	net	10/04/11	2	1	91.5	1.8	4.2		0.3		109.8	109.8	207.5	UVM
Highgate Springs-Shipyard	counted ww as net	10/02/11	1	1		17.5	8.8		8.8				35.1	Citizen Monitor
VTDEC Sta25	net	10/04/11	1	1	24.6		3.1	0.3	0.6		72.3	72.3	100.9	VT DEC
Donaldson Point	counted ww as net	10/05/11	1	1	157.8	157.8	26.3		144.7		129823.1	129823.1	130309.8	UVM
Rte 78 Access	net	10/11/11	1	1	181.8		5.7	1.6	22.2		2103.6	2090.1	2314.9	UVM
Rte 78 Access	net	10/11/11	2	1	324.5		6.1	50.7	20.3		3967.2	3886.1	4368.8	UVM
Alburgh	net	10/11/11	1	1	105.5	0.2	0.4	0.3	0.1		148.4	148.4	254.9	UVM
Alburgh	net	10/11/11	2	1	83.9		0.3	0.6	0.6		68.7	68.7	154.2	UVM
Highgate Cliffs	net	10/11/11	1	1	784.0		4.0		4.6		440.3	440.3	1232.9	UVM

Highgate Cliffs	net	10/11/11	2	1	485.5		0.7	6.6	2.0		546.5	546.5	1041.3	UVM
Highgate Springs	net	10/11/11	1	1	810.1			1.0	2.5		198.6	198.6	1012.3	UVM
Highgate Springs	net	10/11/11	2	1	839.3		0.6	1.8	3.0		281.0	281.0	1125.6	UVM
St. Albans Boat Launch	net	10/11/11	1	1	425.0	79.6		3.2	3.2	1.6	1806.7	1806.7	2319.2	UVM
St. Albans Boat Launch	net	10/11/11	2	1	501.4	7.1	5.4	10.7	3.6		1962.8	1962.8	2490.9	UVM
Highgate Springs-Shipyard	counted ww as net	10/09/11	1	1	359.5		245.5	17.5	736.6		876.9	876.9	2236.1	Citizen Monitor
VTDEC Sta07	net	10/07/11	1	1	196.8	0.4		0.1			50.6	50.6	248.0	VT DEC
VTDEC Sta09	net	10/07/11	1	1	74.5		0.1				39.1	39.1	113.8	VT DEC
VTDEC Sta16	net	10/12/11	1	1	51.5		1.0	0.7	0.1	0.1	131.9	131.9	185.6	VT DEC
VTDEC Sta19	net	10/12/11	1	1	58.3	3.9	1.4	0.1	0.1	0.1	65.6	65.6	129.5	VT DEC
VTDEC Sta21	net	10/12/11	1	1	112.3		0.7	0.3	0.1		26.6	26.6	140.1	VT DEC
Rte 78 Access	net	10/18/11	1	1	54.9		0.3		1.2	0.1	82.4	82.4	138.8	UVM
Rte 78 Access	net	10/18/11	2	1	33.1	0.2	0.1	0.4	0.8		58.2	57.4	92.9	UVM
Alburgh	net	10/18/11	1	1	92.8		0.4		1.5	0.1	230.4	230.4	325.2	UVM
Alburgh	net	10/18/11	2	1	54.8				1.1		140.9	140.9	196.8	UVM
Highgate Cliffs	net	10/18/11	1	1	133.3		0.3		0.3		99.3	97.0	233.2	UVM

Highgate Cliffs	net	10/18/11	2	1	95.7		0.0	0.1	0.5		73.4	73.4	169.7	UVM
Highgate Springs	net	10/18/11	1	1	35.8	0.4	4.1		0.1		41.3	41.3	81.8	UVM
Highgate Springs	net	10/18/11	2	1	59.9	0.2	2.8	0.1	0.2		80.5	80.2	143.7	UVM
St. Albans Boat Launch	net	10/18/11	1	1	195.7	7.1	0.1		2.2		83.6	83.6	288.7	UVM
St. Albans Boat Launch	net	10/18/11	2	1	167.1	1.0	0.5		2.5		157.9	154.8	328.9	UVM
VTDEC Sta46	net	10/14/11	1	1	6.5		1.2	0.0	0.4	0.1	24.4	24.4	32.6	VT DEC
VTDEC Sta50	net	10/14/11	1	1	69.3		0.4	0.3	1.0	0.1	74.3	72.7	145.4	VT DEC
VTDEC Sta51	net	10/14/11	1	1	172.0		0.3	0.8			171.1	170.7	344.2	VT DEC
VTDEC Sta25	net	10/18/11	1	1	103.5	1.7	5.0				15.0	15.0	125.2	VT DEC
VTDEC Sta02	net	10/19/11	1	1	2.3	0.0	0.4		0.0	0.0	0.1		2.9	VT DEC
VTDEC Sta04	net	10/19/11	1	1	1033.4	74.9			1.5		74.9	74.9	1184.6	VT DEC
Rte 78 Access	net	10/31/11	1	1	3.6		0.7	0.7	0.7		13.9	13.9	19.6	UVM
Rte 78 Access	net	10/31/11	2	1	6.5		0.6	2.6	0.5		19.6	19.6	29.9	UVM
Alburgh	net	10/31/11	1	1	6.1		0.2	0.3	0.3		18.4	18.4	25.4	UVM
Alburgh	net	10/31/11	2	1	2.6		0.1	0.4	0.2		19.0	19.0	22.4	UVM
Highgate Cliffs	net	10/31/11	1	1	2.8		0.8	0.1	0.1		28.7	28.7	32.4	UVM
Highgate	net	10/31/11	2	1	2.8		0.8	0.5	0.1		8.5	8.5	12.6	UVM

Cliffs														
Highgate Springs	net	10/31/11	1	1	2.7		0.4		0.0		23.6	23.6	26.8	UVM
Highgate Springs	net	10/31/11	2	1	2.3		0.3	0.2	0.1		3.0	3.0	5.8	UVM
St. Albans Boat Launch	net	10/31/11	1	1	12.1	3.2	0.1	0.1	0.4		8.3	8.3	24.1	UVM
St. Albans Boat Launch	net	10/31/11	2	1	8.8		0.1		0.2				9.1	UVM

Appendix C. Results of Toxin Analyses – Data Summary 2011

Collection Date	Sample Location	Rep	Sample Type	Microcystin by ELISA (analyzed by UVM)	Anatoxin-a by HPLC (analyzed by VDH)		
				Toxin Conc In Lake Water (µg/L)	Less than Reportable Limit	Reportable Limit (ng/mL)	Report (ng/mL)
07/05/11	Highgate Cliffs	1	wwp	1.66			
07/05/11	Highgate Cliffs	2	wwp	1.60			
06/27/11	Mallets Bay-NW shore near Sandbar Motel	1	wwp	0.04	x	0.025	nondetected
07/03/11	Highgate Springs- Shipyard	1	wwp	0.02	x	0.003	nondetected
07/05/11	Larrabee's Point	1	wwp	0.02	x	0.003	nondetected
07/12/11	Highgate Cliffs	1	wwp	0.69	x	0.002	nondetected
07/12/11	Highgate Cliffs	2	wwp	0.81	x	0.002	nondetected
07/12/11	Highgate Springs	1	wwp	0.11	x	0.002	nondetected
07/12/11	Highgate Springs	2	wwp	0.03	x	0.001	nondetected
07/12/11	St. Albans Boat Launch	1	wwp	0.04	x	0.001	nondetected
07/12/11	St. Albans Boat Launch	2	wwp	0.03	x	0.001	nondetected
07/10/11	Rock River Access	1	wwp	0.04	x	0.003	nondetected
07/10/11	High Rocks	1	wwp	0.11	x	0.003	nondetected
07/13/11	Melo Boat Slip	1	wwp	0.02	x	0.005	nondetected
07/19/11	Highgate Cliffs	1	wwp	0.17	x	0.002	nondetected
07/19/11	Highgate Cliffs	2	wwp	0.39	x	0.002	nondetected
07/19/11	Highgate Springs	1	wwp	0.13	x	0.002	nondetected
07/19/11	Highgate Springs	2	wwp	0.15	x	0.002	nondetected
07/17/11	Rock River Access	1	wwp	0.06	x	0.002	nondetected
07/17/11	High Rocks	1	wwp	0.06	x	0.002	nondetected
07/26/11	Alburg - Shore	1	wwp	0.03			
07/26/11	Alburg - Shore	2	wwp	0.12			
07/19/11	North Hero State Park	1	wwp	0.01			
07/23/11	Beggs Park	1	wwp	0.01		0.003	0.024
07/24/11	Carry Bay	1	wwp	0.09	x	0.003	nondetected
07/25/11	St. Albans Bay Park	1	wwp	0.14	x	0.003	nondetected
08/02/11	Highgate Cliffs	1	wwp	0.76	x	0.002	nondetected
08/02/11	Highgate Cliffs	2	wwp	0.98	x	0.002	nondetected
08/02/11	St. Albans Boat Launch	1	wwp	0.04	x	0.003	nondetected
08/02/11	St. Albans Boat Launch	2	wwp	0.02	x	0.003	nondetected
08/01/11	Pelots Bay	1	wwp	0.02	x	0.003	nondetected
08/01/11	High Rocks	1	wwp	1.82	x	0.004	nondetected
08/01/11	Rock River Access	1	wwp	5.95	x	0.005	nondetected

08/01/11	St. Albans Bay Park	1	wwp	0.06	x	0.003	nondetected
08/09/11	Rte 78 Access	1	wwp	0.08	x	0.001	nondetected
08/09/11	Rte 78 Access	2	wwp	0.12	x	0.001	nondetected
08/09/11	Highgate Cliffs	1	wwp	3.42	x	0.002	nondetected
08/09/11	Highgate Cliffs	2	wwp	2.73	x	0.003	nondetected
08/09/11	Highgate Springs	1	wwp	8.06	x	0.050	nondetected
08/09/11	Highgate Springs	2	wwp	12.72	x	0.050	nondetected
08/09/11	St. Albans Boat Launch	1	wwp	0.04	x	0.003	nondetected
08/09/11	St. Albans Boat Launch	2	wwp	0.03	x	0.003	nondetected
08/08/11	Pelots Bay	1	wwp	0.04	x	0.003	nondetected
08/07/11	Rock River Access	1	wwp	0.03	x	0.003	nondetected
08/07/11	High Rocks	1	wwp	8.83	x	0.003	nondetected
08/07/11	Highgate Springs- Shipyard	0	wwp	4.01	x	0.003	nondetected
08/08/11	St. Albans Bay Park	1	wwp	0.02	x	0.003	nondetected
08/16/11	Highgate Springs	1	wwp	2.79	x	0.003	nondetected
08/16/11	Highgate Springs	2	wwp	3.72	x	0.005	nondetected
08/14/11	North Hero State Park	1	wwp	0.08	x	0.003	nondetected
08/23/11	Rte 78 Access	1	wwp	0.12	x	0.002	nondetected
08/23/11	Rte 78 Access	2	wwp	0.12	x	0.002	nondetected
08/23/11	Highgate Cliffs	1	wwp	0.66	x	0.003	nondetected
08/23/11	Highgate Cliffs	2	wwp	0.95	x	0.002	nondetected
08/23/11	Highgate Springs	1	wwp	2.27	x	0.003	nondetected
08/23/11	Highgate Springs	2	wwp	1.95	x	0.003	nondetected
08/18/11	Donaldson Point	1	wwp	0.14	x	0.013	nondetected
08/21/11	St. Albans Bay Park	1	wwp	0.11	x	0.005	nondetected
08/22/11	North Beach	1	wwp	0.03	x	0.003	nondetected
08/21/11	Kingsland Bay Beach	1	wwp	0.01	x	0.003	nondetected
08/21/11	North Hero State Park	1	wwp	0.06	x	0.003	nondetected
08/22/11	Dunham Bay	1	wwp	0.10	x	0.003	present
08/22/11	High Rocks	1	wwp	2.34	x	0.003	nondetected
08/30/11	Alburg - Shore	1	wwp	0.07	x	0.001	nondetected
08/30/11	Alburg	2	wwp	0.05	x	0.001	nondetected
08/29/11	Red Rocks Beach	1	wwp	0.01	x	0.003	nondetected
08/29/11	North Beach	1	wwp	0.01	x	0.003	nondetected
08/27/11	Donaldson Point	1	wwp	0.18	x	0.003	nondetected
08/29/11	Pelots Bay	1	wwp	0.11	x	0.003	present
08/29/11	Point Au Roche State Park	1	wwp	0.01	x	0.002	nondetected
09/06/11	Alburg - Shore	1	wwp	0.14	x	0.002	nondetected
09/06/11	Alburg - Shore	2	wwp	0.18	x	0.001	nondetected
09/06/11	North Hero State Park	1	wwp		x	0.003	nondetected
09/20/11	Alburg - Shore	1	wwp	1.47	x	0.002	nondetected

09/20/11	Alburg - Shore	2	wwp	1.29	x	0.003	nondetected
09/20/11	Highgate Cliffs	1	wwp	0.42	x	0.001	nondetected
09/20/11	Highgate Cliffs	2	wwp	0.41	x	0.001	nondetected
09/20/11	Highgate Springs	1	wwp	4.71	x	0.002	nondetected
09/20/11	Highgate Springs	2	wwp	2.88	x	0.002	nondetected
09/18/11	Highgate Springs- Shipyard	1	wwp	4.91	x	0.003	nondetected
09/21/11	Dunham Bay	1	wwp	0.82	x	0.001	nondetected
09/27/11	St. Albans Boat Launch	1	wwp	0.05	x	0.001	nondetected
09/27/11	St. Albans Boat Launch	2	wwp	0.04	x	0.001	nondetected
09/25/11	Highgate Springs- Shipyard	1	wwp	180.82	x	0.005	nondetected
10/04/11	Rte 78 Access	1	wwp	1.55	x	0.002	nondetected
10/04/11	Rte 78 Access	2	wwp	0.98	x	0.002	nondetected
10/05/11	Donaldson Point - ww grab	1	wwp		x	0.005	nondetected

Appendix D. Total Phosphorus and Total Nitrogen Data Summary 2011

Date	Location	Rep	Time	TN (mg/L)	TP (µg/L)
06-Jun-11	North Beach shoreline	1	10:50	0.52	21.78
06-Jun-11	North Beach shoreline	2	10:50	0.58	20.38
06-Jun-11	Red Rocks Beach shoreline	1	10:24	0.65	26.47
06-Jun-11	Red Rocks Beach shoreline	2	10:24	0.57	20.49
07-Jun-11	Alburgh	1	10:37	0.90	43.43
07-Jun-11	Alburgh	2	10:37	0.81	43.10
07-Jun-11	Highgate Cliffs	1	10:20	0.83	42.47
07-Jun-11	Highgate Cliffs	2	10:20	0.76	39.33
07-Jun-11	Highgate Springs	1	10:00	0.87	38.36
07-Jun-11	Highgate Springs	2	10:00	1.25	45.49
07-Jun-11	Rock River Access	1	10:05	0.98	68.29
07-Jun-11	Rock River Access	2	10:05	0.95	67.99
07-Jun-11	Rte 78 Access	1	10:45	0.72	40.35
07-Jun-11	Rte 78 Access	2	10:45	0.87	40.73
07-Jun-11	St. Albans Boat Launch	1	11:32	0.46	38.28
07-Jun-11	St. Albans Boat Launch	2	11:32	0.60	37.18
20-Jun-11	North Beach shoreline	1	10:22	0.60	24.21
20-Jun-11	North Beach shoreline	2	10:22	0.61	20.65
20-Jun-11	Red Rocks Beach shoreline	1	10:00	0.73	23.85
20-Jun-11	Red Rocks Beach shoreline	2	10:00	0.65	29.03
21-Jun-11	Alburgh	1	10:47	0.82	38.37
21-Jun-11	Alburgh	2	10:47	0.77	36.64
21-Jun-11	Highgate Cliffs	1	10:30	0.83	54.61
21-Jun-11	Highgate Cliffs	2	10:30	0.87	62.01

21-Jun-11	Highgate Springs	1	10:07	0.90	49.52
21-Jun-11	Highgate Springs	2	10:07	1.19	50.92
21-Jun-11	Rock River Access	1	10:20	0.87	73.88
21-Jun-11	Rock River Access	2	10:20	0.99	68.12
21-Jun-11	Rte 78 Access	1	11:00	0.77	42.37
21-Jun-11	Rte 78 Access	2	11:00	0.79	45.90
21-Jun-11	St. Albans Boat Launch	1	11:38	0.66	31.74
21-Jun-11	St. Albans Boat Launch	2	11:38	0.49	34.48
05-Jul-11	Alburgh	1	10:27	0.48	22.46
05-Jul-11	Alburgh	2	10:27	0.50	28.15
05-Jul-11	Highgate Cliffs	1	10:06	0.59	33.92
05-Jul-11	Highgate Cliffs	2	10:06	0.76	39.12
05-Jul-11	Highgate Springs	1	10:00	1.31	54.93
05-Jul-11	Highgate Springs	2	10:00	0.77	44.26
05-Jul-11	North Beach shoreline	1	12:50	0.47	43.78
05-Jul-11	Red Rocks Beach shoreline	1	12:40	0.54	37.45
05-Jul-11	Rte 78 Access	1	10:34	0.48	24.69
05-Jul-11	Rte 78 Access	2	10:34	0.59	23.06
05-Jul-11	St. Albans Boat Launch	1	11:30	0.80	31.17
05-Jul-11	St. Albans Boat Launch	2	11:30	0.33	35.16
11-Jul-11	North Beach shoreline	1	11:46	0.56	67.65
11-Jul-11	Red Rocks Beach shoreline	1	12:20	0.43	39.59
12-Jul-11	Alburgh - Shore	1	11:04	0.61	30.05
12-Jul-11	Alburgh - Shore	2	11:04	0.69	31.92
12-Jul-11	Highgate Cliffs	1	10:12	1.18	57.43
12-Jul-11	Highgate Cliffs	2	10:12	1.25	56.89
12-Jul-11	Highgate Springs	1	10:01	0.85	53.75

12-Jul-11	Highgate Springs	2	10:01	0.97	51.60
12-Jul-11	Rte 78 Access	1	10:40	0.57	28.32
12-Jul-11	Rte 78 Access	2	10:40	0.56	29.93
12-Jul-11	St. Albans Boat Launch	1	11:50	0.72	32.35
12-Jul-11	St. Albans Boat Launch	2	11:50	0.52	33.64
18-Jul-11	North Beach shoreline	1	12:00	0.42	75.36
18-Jul-11	Red Rocks Beach shoreline	1	12:15	0.39	54.86
19-Jul-11	Alburgh	1	10:20	0.49	33.02
19-Jul-11	Alburgh	2	10:20	0.47	40.99
19-Jul-11	Highgate Cliffs	1	10:05	0.71	65.71
19-Jul-11	Highgate Cliffs	2	10:05	0.79	61.82
19-Jul-11	Highgate Springs	1	10:00	0.69	46.67
19-Jul-11	Highgate Springs	2	10:00	0.91	47.30
19-Jul-11	Rte 78 Access	1	10:35	0.49	41.02
19-Jul-11	Rte 78 Access	2	10:35	0.41	48.13
19-Jul-11	St. Albans Boat Launch	1	11:25	0.28	30.25
19-Jul-11	St. Albans Boat Launch	2	11:25	0.36	31.10
25-Jul-11	North Beach shoreline	1	12:30	0.36	51.86
25-Jul-11	Red Rocks Beach shoreline	1	11:15	0.28	78.22
26-Jul-11	Alburgh - Shore	1	10:35	0.61	57.79
26-Jul-11	Alburgh - Shore	2	10:35	0.51	47.26
26-Jul-11	Rte 78 Access- shore	1	10:03	0.52	45.16
26-Jul-11	Rte 78 Access- shore	2	10:03	0.45	44.30
26-Jul-11	St. Albans Boat Launch	1	11:25	0.36	38.96
26-Jul-11	St. Albans Boat Launch	2	11:25	0.37	41.57
01-Aug-11	North Beach shoreline	1		0.38	122.35
01-Aug-11	Red Rocks Beach shoreline	1	13:00	0.46	124.80

02-Aug-11	Alburgh	1	10:45	0.48	39.86
02-Aug-11	Alburgh	2	10:45	0.49	39.67
02-Aug-11	Highgate Cliffs	1	10:20	0.88	68.32
02-Aug-11	Highgate Cliffs	2	10:20	0.86	69.58
02-Aug-11	Highgate Springs	1	10:00	0.67	42.88
02-Aug-11	Highgate Springs	2	10:00	0.82	49.02
02-Aug-11	Rte 78 Access	1	10:55	0.51	51.70
02-Aug-11	Rte 78 Access	2	10:55	0.51	45.93
02-Aug-11	St. Albans Boat Launch	1	11:50	1.58	96.92
02-Aug-11	St. Albans Boat Launch	2	11:50	1.30	99.40
08-Aug-11	North Beach shoreline	1	13:30	0.40	29.33
08-Aug-11	Red Rocks Beach shoreline	1	12:00	0.37	19.32
09-Aug-11	Alburgh	1	10:28	0.60	48.34
09-Aug-11	Alburgh	2	10:28	0.59	48.32
09-Aug-11	Highgate Cliffs	1	10:08	1.37	96.11
09-Aug-11	Highgate Cliffs	2	10:08	1.35	86.90
09-Aug-11	Highgate Springs	1	10:00	6.43	1304.04
09-Aug-11	Highgate Springs	2	10:00	6.38	1168.65
09-Aug-11	Rte 78 Access	1	10:40	0.85	58.79
09-Aug-11	Rte 78 Access	2	10:00	0.72	59.02
09-Aug-11	St. Albans Boat Launch	1	11:37	0.87	60.52
09-Aug-11	St. Albans Boat Launch	2	11:37	1.07	55.93
15-Aug-11	North Beach shoreline	1	12:00	0.27	17.72
15-Aug-11	Red Rocks Beach shoreline	1	12:30	0.26	18.77
16-Aug-11	Alburgh	1	10:28	0.54	52.34
16-Aug-11	Alburgh	2	10:28	0.49	52.55
16-Aug-11	Highgate Cliffs	1	10:10	1.12	87.80

16-Aug-11	Highgate Cliffs	2	10:10	1.15	92.69
16-Aug-11	Highgate Springs	1	10:00	1.54	115.48
16-Aug-11	Highgate Springs	2	10:00	1.53	109.19
16-Aug-11	Rte 78 Access	1	10:40	0.56	54.40
16-Aug-11	Rte 78 Access	2	10:40	0.51	51.56
16-Aug-11	St. Albans Boat Launch	1	11:34	1.36	108.95
16-Aug-11	St. Albans Boat Launch	2	11:35	0.79	81.05
22-Aug-11	North Beach	1	11:00	0.34	39.32
22-Aug-11	Red Rocks Beach shoreline	1	13:30	0.27	18.52
23-Aug-11	Alburgh	1	10:43	0.52	50.81
23-Aug-11	Alburgh	2	10:43	0.57	51.25
23-Aug-11	Highgate Cliffs	1	10:23	0.82	76.25
23-Aug-11	Highgate Cliffs	2	10:23	0.76	71.72
23-Aug-11	Highgate Springs	1	10:00	0.97	90.02
23-Aug-11	Highgate Springs	2	10:00	1.16	108.38
23-Aug-11	Rte 78 Access	1	10:55	0.55	49.79
23-Aug-11	Rte 78 Access	2	10:55	0.62	50.96
23-Aug-11	St. Albans Boat Launch	1	11:47	0.48	37.16
23-Aug-11	St. Albans Boat Launch	2	11:47	0.47	40.15
29-Aug-11	North Beach shoreline	1	13:30	0.44	26.36
29-Aug-11	Red Rocks Beach shoreline	1	13:30	0.35	21.63
30-Aug-11	Alburgh - Shore	1	10:43	0.82	85.90
30-Aug-11	Alburgh - Shore	2	10:43	0.60	99.15
30-Aug-11	Rte 78 Access	1	10:30	0.53	75.43
30-Aug-11	Rte 78 Access	2	10:30	0.66	77.54
30-Aug-11	St. Albans Boat Launch	1	11:28	0.44	38.81
30-Aug-11	St. Albans Boat Launch	2	11:28	0.44	49.05

06-Sep-11	Alburgh - Shore	1	10:05	0.64	76.53
06-Sep-11	Alburgh - Shore	2	10:05	1.01	80.09
06-Sep-11	North Beach shoreline	1		0.47	36.34
06-Sep-11	Red Rocks Beach shoreline	1	12:30	0.55	29.79
06-Sep-11	Rte 78 Access- shore	1	9:52	1.04	97.84
06-Sep-11	Rte 78 Access- shore	2	9:52	0.97	89.12
06-Sep-11	St. Albans Boat Launch	1	10:55	0.45	28.68
06-Sep-11	St. Albans Boat Launch	2	10:55	0.38	36.28
13-Sep-11	Alburgh	1	9:55	1.09	67.42
13-Sep-11	Alburgh	2	9:55	1.01	71.93
13-Sep-11	Rte 78 Access	1	10:05	1.02	77.24
13-Sep-11	St. Albans Boat Launch	1	11:30	1.08	49.72
13-Sep-11	St. Albans Boat Launch	2		0.70	43.55
20-Sep-11	Alburgh - Shore	1	10:50	1.11	124.74
20-Sep-11	Alburgh - Shore	2	10:50	1.09	146.90
20-Sep-11	Highgate Cliffs	1	9:55	0.83	61.88
20-Sep-11	Highgate Cliffs	2	9:55	0.75	59.46
20-Sep-11	Highgate Springs	1	10:05	1.13	97.82
20-Sep-11	Highgate Springs	2	10:05	1.10	120.38
20-Sep-11	Rte 78 Access- shore	1	10:35	0.80	78.48
20-Sep-11	Rte 78 Access- shore	2	10:35	0.78	76.72
20-Sep-11	St. Albans Boat Launch	1	11:40	0.39	34.35
20-Sep-11	St. Albans Boat Launch	2	11:40	0.38	34.09
27-Sep-11	Alburgh	1	10:30	4.01	567.19
27-Sep-11	Alburgh	2	10:30	2.60	384.29
27-Sep-11	Highgate Cliffs	1	10:12	0.84	59.20
27-Sep-11	Highgate Cliffs	2	10:12	1.00	64.34

27-Sep-11	Highgate Springs	1	10:00	3.99	512.05
27-Sep-11	Highgate Springs	2	10:00	2.03	143.36
27-Sep-11	Rte 78 Access	1	10:41	0.68	63.51
27-Sep-11	Rte 78 Access	2	10:41	0.65	52.39
27-Sep-11	St. Albans Boat Launch	1	11:40	0.49	42.26
27-Sep-11	St. Albans Boat Launch	2	11:40	0.52	49.19
04-Oct-11	Alburgh	1	10:17	0.76	61.97
04-Oct-11	Alburgh	2	10:17	0.85	66.35
04-Oct-11	Highgate Cliffs	1	10:47	1.11	86.63
04-Oct-11	Highgate Cliffs	2	10:47	0.87	81.74
04-Oct-11	Highgate Springs	1	10:55	1.17	86.90
04-Oct-11	Highgate Springs	2	10:55	0.82	75.33
04-Oct-11	Rte 78 Access	1	10:25	0.83	81.51
04-Oct-11	Rte 78 Access	2	10:25	0.98	90.94
04-Oct-11	St. Albans Boat Launch	1	12:08	0.48	33.28
04-Oct-11	St. Albans Boat Launch	2	12:08	0.48	28.65
11-Oct-11	Alburgh	1	10:23	0.65	49.28
11-Oct-11	Alburgh	2	10:23	0.58	50.98
11-Oct-11	Highgate Cliffs	1	10:12	0.80	74.46
11-Oct-11	Highgate Cliffs	2	10:12	0.93	73.09
11-Oct-11	Highgate Springs	1	10:00	0.96	62.99
11-Oct-11	Highgate Springs	2	10:00	1.03	69.64
11-Oct-11	Rte 78 Access	1	10:38	0.78	100.45
11-Oct-11	Rte 78 Access	2	10:38	0.88	91.40
11-Oct-11	St. Albans Boat Launch	1	11:26	0.40	40.37
11-Oct-11	St. Albans Boat Launch	2	11:26	0.50	44.06
18-Oct-11	Alburgh	1	10:40	0.88	60.18

18-Oct-11	Alburgh	2	10:40	0.82	61.27
18-Oct-11	Highgate Cliffs	1	10:20	0.73	46.65
18-Oct-11	Highgate Cliffs	2	10:20	0.82	52.01
18-Oct-11	Highgate Springs	1	10:00	0.90	50.44
18-Oct-11	Highgate Springs	2	10:00	0.77	50.24
18-Oct-11	Rte 78 Access	1	10:55	0.67	63.08
18-Oct-11	Rte 78 Access	2	10:55	0.75	58.34
18-Oct-11	St. Albans Boat Launch	1	11:25	0.40	46.02
18-Oct-11	St. Albans Boat Launch	2	11:25	0.58	50.04
31-Oct-11	Alburgh	1	10:50	0.68	59.26
31-Oct-11	Alburgh	2	10:50	0.69	56.29
31-Oct-11	Highgate Cliffs	1	10:31	0.59	48.13
31-Oct-11	Highgate Cliffs	2	10:31	0.58	46.48
31-Oct-11	Highgate Springs	1	10:18	0.68	59.71
31-Oct-11	Highgate Springs	2	10:18	0.66	56.83
31-Oct-11	Rte 78 Access	1	11:03	0.68	55.77
31-Oct-11	Rte 78 Access	2	11:03	0.63	55.19
31-Oct-11	St. Albans Boat Launch	1	11:57	0.39	29.13
31-Oct-11	St. Albans Boat Launch	2	11:57	0.33	29.47

Appendix E. Partnerships 2011

Key Partners in Implementing Monitoring Program

Lake Champlain Basin Program
Lake Champlain Committee
Missisquoi National Wildlife Refuge
Vermont DEC
Vermont Department of Health

Recipients of Weekly Alerts

Association of Water Suppliers
Clinton County Public Health
Lake Champlain Basin Program
Lake Champlain Committee
Ministry of Sustainable Development, Environment and Parks
Missisquoi National Wildlife Refuge
New York DEC
New York Department of Health
Panton Water District
Quebec Municipalities
SUNY ESF
SUNY Plattsburgh
Vermont DEC
Vermont Department of Health
Water Treatment Plant Operators