

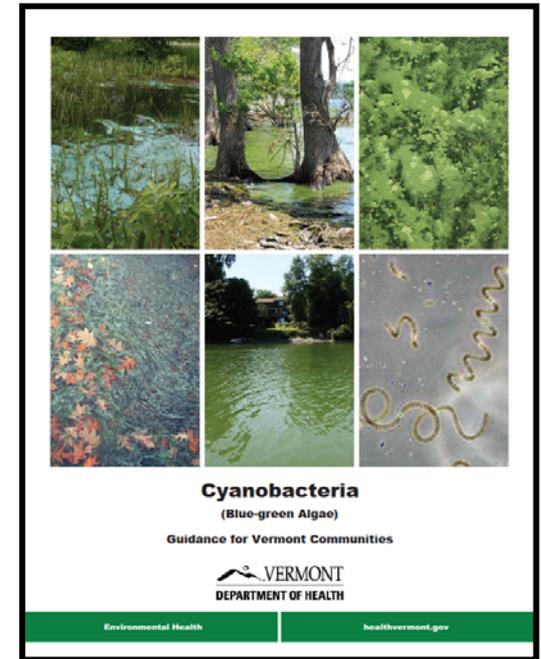
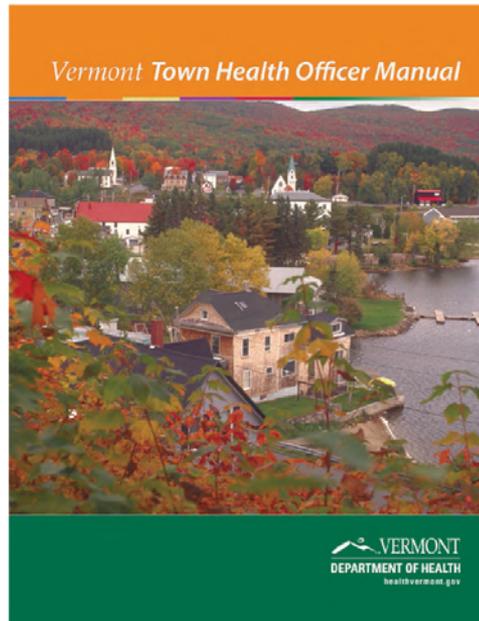
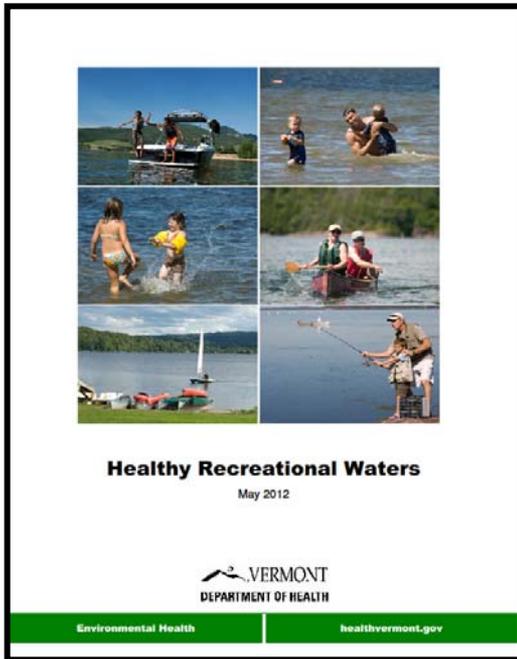


Healthy Recreational Waters

Blue Green Algae

Vermont Town Health Officers

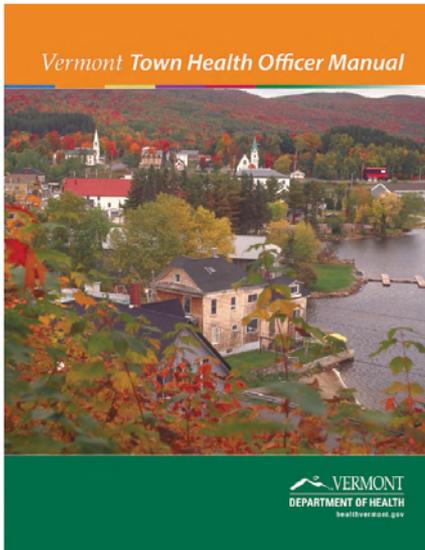
THO Resources



Town Health Officer Manual

Chapter 9: Recreational Water

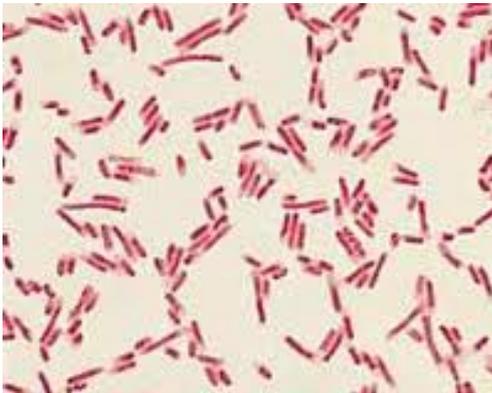
- *E. Coli* Bacterial Monitoring
- Blue-Green Algae (Cyanobacteria) Monitoring
- General Beach Health and Safety



E. Coli Monitoring



In Vermont, *Escherichia coli* (*E. coli*) bacteria is the most used measure of freshwater beach quality for human health. Levels of *E. coli* have been determined by the EPA to correlate the best with GI illness in FRESH water.



E. coli density in water is used as a surrogate to identify if there is recent viable fecal matter present in the water.

High levels of *E. Coli* can indicate presence of disease causing bacteria, viruses and parasites.

Bacterial Contamination

Human – Sewage

System failures at sewage treatment facilities, failed septic systems, releases from boat and recreational vehicle holding tanks, pumping stations, damaged sewer lines, and portable toilets can all be sources of biological contamination.

Human – Swimmer to Swimmer

One of the most common causes of fecal contamination and illness at beaches is actually other bathers. Anyone who is experiencing diarrhea should stay out of the water.

Animal – Pets, Agriculture, Wildlife

Animals' feces can be carried into the water from rain, or directly deposited into the water.

It's difficult to tell the difference between the potential health risks that can be caused by human feces and the feces of other warm-blooded animals.

Town Health Officer Manual

E. Coli Monitoring - Guidance Level

UPDATED 2012

In December 2011, the US EPA released draft guidance for recreational water quality.

In this scientific review of more than 20 years of data, EPA provided guidance for the density of *E. coli* that would warrant beach notification.

The Vermont Department of Health's current guidance is based on this review.

Guidance value: *E. coli* bacteria density should not exceed **235** colony forming units (cfu) per 100 milliliters of water.

Bacterial Contamination

Health Effects

- Most frequently reported recreational water health effect is GI illness, seconded by skin irritation/dermatitis.
- Caused by parasites, bacteria or viruses

More susceptible populations:

- Children (more accidental ingestion too)
- Immunocompromised people
- Pregnant women

Town Health Officer Manual

Role of the Town Health Officer

- *E. Coli* monitoring or sampling of public swimming areas
- Closure and reopening of public swimming areas due to high *E.coli* levels or other pollutant (chemical spill, oil spill) or safety hazard (fallen tree large objects in water)
- Investigation of possible sources of contamination (failed septic system, leaking sewer line)

VDH Laboratory Test Kit SW



VDH Laboratory

\$15.00 per sample

**Phone: 802-863-7560
(Kit Ordering direct line)**

http://healthvermont.gov/enviro/ph_lab/water_test.aspx

Healthy Recreational Waters

***E. Coli* Monitoring - Where and when to Sample**

- Sampling should be done once a week during the swimming season.
- Collect samples at locations and times of greatest bather use.
- At beaches greater than 300 feet long, more than one sample is recommended to obtain representative data.
- Alternate sampling sites may be considered based on geographical features of the beach, potential contamination sources and bather usages.

Healthy Recreational Waters



Healthy Recreational Waters

May 2012



Environmental Health

healthvermont.gov

Vermont Department of Health

Healthy Recreational Waters

Program Objectives

- Provide swimming area managers a framework for monitoring water quality, and a protocol for addressing incidences of contamination from a variety of sources.
- Provide Vermonters with easy to understand guidance on safe and healthy recreational waters.
- Strengthen partnerships among federal, state, local and private stakeholders.
- Contribute to the overall quality, safety and preservation of Vermont's recreational waters.

Healthy Recreational Waters

Sanitary Surveys

- Identify and document potential sources of contamination
- General weather, water temperature, visual water quality, bather load and activity usage, discharge sources, waste, algae and wildlife
- Evaluate swimming area conditions in real time and to compare historical observations



Recreational Water Sanitary Survey

NAME OF BEACH AND TOWN _____ DATE AND TIME OF SURVEY _____

TYPE OF BEACH: STATE MUNICIPAL OTHER-PUBLIC OTHER-PRIVATE

SURVEYOR NAME(S): _____ TITLE, ORGANIZATION: _____

GENERAL BEACH CONDITIONS

Air Temperature _____ °C OR °F
WIND: Calm Light Moderate Strong DIRECTION _____
Hours since last rain event <24 <48 <72 >72 Amount of rain _____ inches
Weather Conditions:
Sky Condition: Sunny Mostly Sunny Partly Sunny Mostly Cloudy Cloudy
Wave Intensity: Calm Normal Rough
Comments / Observations: _____

WATER QUALITY

Water Temperature _____ °F Recent change in color? Yes No
Odor: None Septic Algae Sulfur Other _____
Clarity / Turbidity: Clear Slightly Turbid Turbid Opaque
Comments / Observations: _____

BATHER LOAD

Number of people in the water: _____ Number of people out of water: _____
Total number of people at the beach: _____

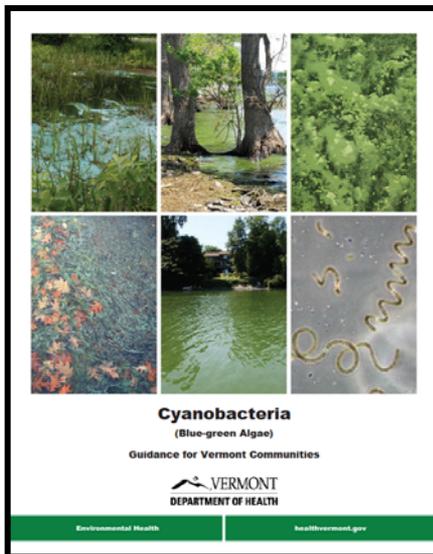
List activities seen

Type of Activity	Bathing	Watercraft	Playing in sand	Other
Number of People				

Comments / Observations: _____

Town Health Officers

Cyanobacteria (Blue-green Algae) Monitoring



VERMONT
DEPARTMENT OF HEALTH

HEALTH ALERT

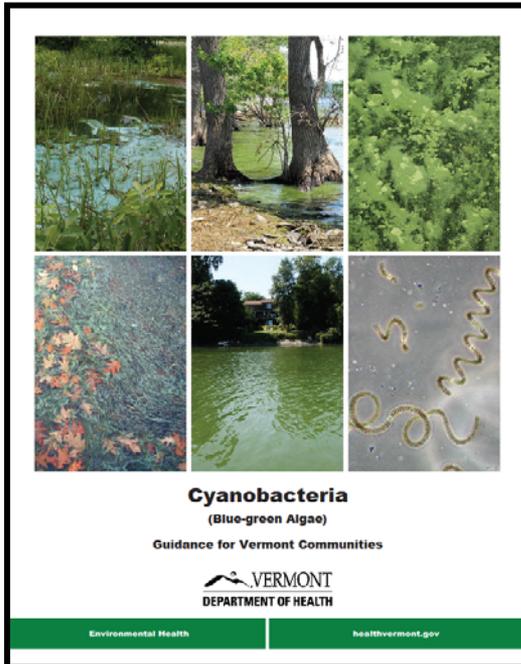
Keep children and pets
away from

 **ALGAE** 

Water may be green, blue, brown, red
or appear cloudy. A thick foam or mat may be
on the shoreline. Some algae may cause illness.

To report algae or for more information call
1-800-439-8550
or visit healthvermont.gov

BGA Community Guidance Document



The Vermont Department of Health (VDH) and the Vermont Department of Environmental Conservation (DEC) have developed this document as a reference guide for communities whose lakes and ponds are impacted by cyanobacterial blooms.

- Provide tools for identification of blooms
- Provide a reference on the nature of cyanobacteria
- Provide tools to determine public health risk from bloom
- Provide guidance for determining use-restrictions of water (recreational and drinking)

BGA Community Guidance Document

What are Blue Green Algae (cyanobacteria)?

- Cyanobacteria are common and natural aquatic organisms present in many surface waters.
- Cyanobacteria are single-celled microscopic bacteria and can be found in fresh, salt or brackish waters.
- In ideal conditions cyanobacteria can multiply rapidly creating visible floating colonies often referred to a bloom or scum.
- Cyanobacterial blooms are not always blue-green. They can be blue, bright green, brown, or red.
- Bloom appearance can be best described as “pea soup” or “spilled paint” on the water’s surface.

BGA Community Guidance Document

What are the health concerns?

- People may get rashes or other skin irritations from coming into contact with blooms.
- Inhalation of water droplets that have toxins in them may cause allergic-like reactions, runny noses, or sore throats.
- Swallowing water that has high levels of cyanobacterial toxins in it can cause diarrhea and vomiting.
- Liver or kidney damage that may take hours or days to show up in people or animals.
- To date, in Vermont there have been no known human-related deaths from cyanobacterial blooms.

BGA Community Guidance Document

How can people get exposed?

Recreational Water

Public recreational areas that have blooms present or blooms that recently died can expose swimmers to toxins through skin contact, inhalation of water droplets or ingestion of water.



Drinking Water

Household water supplies that are pumped from waters with cyanobacterial blooms may have exposures through drinking, bathing, and other activities.



BGA Community Guidance Document

Monitoring and Identification - Category 1

The water is clear. There is no visible floating material. There are few visible particles. The water does not look cloudy brown or green.



BGA Community Guidance Document

Monitoring and Identification - Category 2

Particles can be seen distributed in a thin dispersed layer at the surface or along the shore.



BGA Community Guidance Document

Monitoring and Identification - Category 3

- The water is discolored and cloudy. The bottom is not visible close to shore. Canoe paddles or boat hooks are not easily distinguished below the boat.
- Particles are present in a thick layer at the surface or along the shoreline. The accumulated material may be pale green, greenish-blue or blue in color.



BGA Community Guidance Document

Role of the Town Health Officer

- Investigate complaints from citizens regarding algae at public swimming areas.
- If you suspect a blue green algae bloom at a public beach, take water sample for toxins and send to VDH Lab.
- Test Kits are available to Town Health Officers at VDH district offices and at the VDH lab.
- Post warning or closure signs, if warranted.
- Report occurrences to Health Department.

Healthy Recreational Waters

Resources

- **Sanitary Survey Form**
- **Sanitary Survey Guide**
- **Blue-Green Algae Monitoring Data Sheet**
- **Recreational Water Sample Data Sheet**
- **Signs**
- **Fact Sheets**

Sanitary Survey



Recreational Water Sanitary Survey

NAME OF BEACH AND TOWN _____ **DATE AND TIME OF SURVEY** _____

TYPE OF BEACH: STATE MUNICIPAL OTHER-PUBLIC OTHER-PRIVATE

SURVEYOR NAME(S): _____ **TITLE, ORGANIZATION:** _____

GENERAL BEACH CONDITIONS

Air Temperature _____ °C OR °F
 WIND: Calm Light Moderate Strong DIRECTION _____
 Hours since last rain event <24 <48 <72 >72 Amount of rain _____ inches
 Weather Conditions: _____
 Sky Condition: Sunny Mostly Sunny Partly Sunny Mostly Cloudy Cloudy

Wave Intensity: Calm Normal Rough
 Comments / Observations: _____

WATER QUALITY

Water Temperature _____ °F Recent change in color? Yes No
 Odor: None Septic Algae Sulfur Other _____
 Clarity / Turbidity: Clear Slightly Turbid Turbid Opaque
 Comments / Observations: _____

BATHER LOAD

Number of people in the water: _____ Number of people out of water: _____
 Total number of people at the beach: _____

List activities seen

Type of Activity	Bathing	Watercraft	Playing in sand	Other
Number of People				

Comments / Observations: _____

POTENTIAL POLLUTION SOURCES

Sources of Discharge

Type	River	Pond	Wetland	Outfall	Other (specify)
Name of Source(s)					
Amount					
Flow Rate					
Volume					
Characteristics					

Floatables Present: Yes No Please circle the following if floatables found:

Type	Street Litter	Food Litter	Medical Items	Sewage Related	Fishing Related	Building Materials	Household Waste
Example	Cigarette Filter	Beverage Container	Syringes	Condoms, Tampons	Fishing Line, lures	Pieces of Wood, siding	Plastic Bags

Amount of Beach Debris/Litter on Beach: (percent of beach area)
 None Low (1-20%) Moderate (21-50%) High (>50%)

Amount of Algae in Near-shore Water: (percent of swim area coverage)
 None Low (1-20%) Moderate (21-50%) High (>50%)

Amount of Algae on Beach (percent of beach length)
 None Low (1-20%) Moderate (21-50%) High (>50%)

Types of algae found

Type	Periphyton	Globular	Free Floating	Other
Description	Attached to rocks, stringy	Blobs of floating material	No Obvious mass	

Color of algae found
 Light green bright green Dark green Yellow Brown Other

Presence of Wildlife and Domestic Animals

Type	Geese	Gulls	Dogs	Other (Specify)
Number				

List the number and species of bird found dead on the beach

Number of dead fish found on the beach: _____ Is this more than normal? _____

Comments / Observations: _____

Recreational Water Sample Data Form



Recreational Water Sample Data Form

Name of Beach & Date of Sample

General weather conditions (circle best option)				
Rain in last 24 hours:				
none	light rain showers	steady showers	heavy rain/ thunderstorms	
Current day (expected conditions)			Daytime Temperature (average)	
Sunny	Cloudy	Rainy	less than 60F	80-90F
			60-70F	90F+
			70-80F	
Water Clarity (circle one)		Clear	Slightly Turbid	Turbid

Algae present?
No
Yes If so, color _____

Debris present (check (✓) if present)	on beach	in water
food-related (cans, wrappers)	_____	_____
medical/sewage-related (condoms, diapers)	_____	_____
other trash (bags)	_____	_____

Wildlife present? (If so, which? circle)	
Geese	Dogs
other birds	Other

Healthy Recreational Waters

MONITORING

Water is considered safe for swimming

The water at this beach is tested regularly during the swimming season.

For current beach conditions contact:

**For more information on the Healthy Recreational Water project or general health questions,
contact the Vermont Department of Health at healthvermont.gov or 1-800-439-8550**

Posted on: _____

Vermont Department of Health

Healthy Recreational Waters

NOTICE

Water **MAY NOT** be safe for swimming due to recent heavy rain.

Studies show bacteria may increase to unhealthy levels for a day after heavy rainfall.

The water at this beach is tested regularly during the swimming season.

For current beach conditions contact:

**For more information on the Healthy Recreational Water project or general health questions,
contact the Vermont Department of Health at healthvermont.gov or 1-800-439-8550**

Posted on: _____

Healthy Recreational Waters

ALERT

Do not swim — High Levels of Bacteria

The water at this beach is tested regularly during the swimming season.

For current beach conditions contact:

**For more information on the Healthy Recreational Water project or general health questions,
contact the Vermont Department of Health at healthvermont.gov or 1-800-439-8550**

Posted on: _____

Vermont Department of Health

Blue-Green Algae Alert and Beach Close Sign


HEALTH ALERT

**Keep children and pets
away from
ALGAE**

Water may be green, blue, brown, red or appear cloudy. A thick foam or mat may be on the shoreline. Some algae may cause illness.

To report algae or for more information call

1-800-439-8550

or visit healthvermont.gov

**ATTENTION
SWIMMING AREA CLOSED**

as of _____

The _____ local health officer has determined that swimming in this area presents a public health risk because of water contaminated by _____.

It will be retested on _____ (date).

For more information contact:

Phone: _____

Signed: _____

Local Town Health Officer


DEPARTMENT OF HEALTH
healthvermont.gov

Blue-Green Algae Monitoring Sheet

Monitoring Data Sheet For Cyanobacterial Blooms in Vermont

Date of Assessment: _____

Weather Conditions (sunny, rainy, approximate temperature):

Name of Waterbody and Owner:

Location (as specific as possible, town, beach name or other easily identifiable landmarks nearby):

Category of Bloom (1, 2, or 3): _____

Previous Occurrences of Blooms?

- Never
- Occasional (short periods of blooms, not on annual basis)
- Occasional (short periods of blooms, annually)
- Frequent (blooms annually)

Usage at this location.

➤ Number of people (approximate) who use water daily: _____

➤ Number of animals (approximate) who use water daily: _____

➤ Type of water usage (check all that apply):

- Swimming or other full body contact activities (posted as a beach)
- Swimming or other full body contact activities (not a posted beach area, i.e., swimming hole)
- Boating (non-motorized)
- Boating (motorized)
- Drinking Water (Private Intake)
- Drinking Water (Public Intake)
- Fishing

Healthy Recreational Waters

Fact Sheets- healthvermont.gov



Healthy Recreational Waters



Vermont is home to thousands of fresh water lakes, ponds, rivers and streams. Our waters are a great destination for everything from swimming to fishing to boating and tubing.

What are healthy beaches?

Healthy beaches are both safe and clean. But beaches and other swimming areas do not stay healthy all the time. Many factors can influence the overall health and safety of recreational waters: bacterial contamination, chemical spills, storm water runoff, harmful algae blooms, physical hazards, etc.

How can water become contaminated with bacteria?

One major source of harmful bacterial is fecal contamination, which can come from diapers, feces from people, pets or wildlife, malfunctioning septic systems, storm water runoff and sewage treatment overflows.

How are Vermont beaches monitored and tested?

Vermont State Parks follow the Health Department's *Guidelines for Healthy Beaches*. Swimming areas are sampled before the start of the swimming season and then at least once a week, depending the conditions of the water body.

Municipal or non-profit managed public swimming areas should be monitored regularly according to the Vermont Department of Health's *Healthy Recreational Waters Guidelines*.

What can I do to help keep Vermont beaches healthy?

- Properly dispose of litter/animal wastes.
- Do not go swimming if you are feeling ill – especially if you have diarrhea.
- Do not feed birds or other wildlife on or near swimming areas.
- Do not dump anything in a storm drain.
- Report any suspected pollution event to beach management.

What can I do to protect my health?

- Heed posted advisories or closings.
- Do not swallow beach water and try not to get it in your mouth.
- Stay out of the water 48 hours following a significant rain event.
- Shower after swimming.
- Wash hands before eating.
- Do not go in the water if you have diarrhea.



Swim Water Testing

Do you know the quality of the water at your favorite swimming area?

Rivers, ponds, lakes and streams may contain disease-causing microorganisms. Swimming in these waters may result in health effects such as minor skin rashes, sore throats, diarrhea or more serious problems.

Children tend to spend more time in the water than adults. They are also more likely to accidentally swallow water when swimming and, for this reason, they are more likely than adults to get sick. However, infants, the elderly, and people with weakened immune systems are most at risk of becoming seriously ill.

What is swimming water tested for?

Water in ponds, lakes and rivers is tested for *Escherichia coli*, commonly known as *E. coli*, to determine whether it is suitable for swimming. *E. coli* is a bacterium that is comes from human or animal wastes. Its presence in water means that other disease-causing microorganisms may be present as well.

When should water samples be taken?

Water samples should be taken at the peak times and at the most popular locations for swimming – in other words, where and when the people are. Once the sample is taken, deliver or mail it to the laboratory as soon as possible. Testing should be done within 30 hours after the sample is collected, so if you mail the sample, use first class or overnight delivery. Because conditions can change quickly, testing early in the week leaves time to take follow-up samples in the same week if first results show high levels of bacteria not suitable for swimming.



The Vermont Department of Health Laboratory swimming water test kit is called 'Kit SW' and costs \$15. This includes bottle, instructions, paperwork, insulated container and the cost of analysis. Samples are accepted Monday through Friday, 7:45 a.m. to 4:00 p.m.

Test results for samples submitted to the Health Department Laboratory on a Friday will normally not be available until the following Monday, unless special arrangements are made.

Where should samples be taken?

Water samples should be taken in an area where the water is at least three feet deep. The sample should be taken one foot below the water surface. Detailed sampling instructions are included with the test kit.

How often should water be tested?

The Health Department recommends that swimming water at town beaches and other public recreational areas be tested at least once a week from Memorial Day to Labor Day. Additional testing may be warranted after periods of heavy rain when swimming areas are more likely to be flooded by runoff. People who have a pond or private swimming area on their own property should test for water quality periodically throughout the summer months.

THANK YOU

Have a great summer!

Andy Chevrefils

Andrew.chevrefils@state.vt.us

802-951-0114