

What are Algae and Cyanobacteria?

Algae are plants that do not have true leaves, roots or flowers like other aquatic plants. They can be invisible to the naked eye or similar in size to other rooted aquatic plants. They form the base of the food chain in lakes and are eaten by a variety of organisms, which are in turn eaten by larger insects, fish and predators. Cyanobacteria, also known as blue-green algae, are photosynthetic bacteria. They are native organisms and can be found in any water body in Vermont.

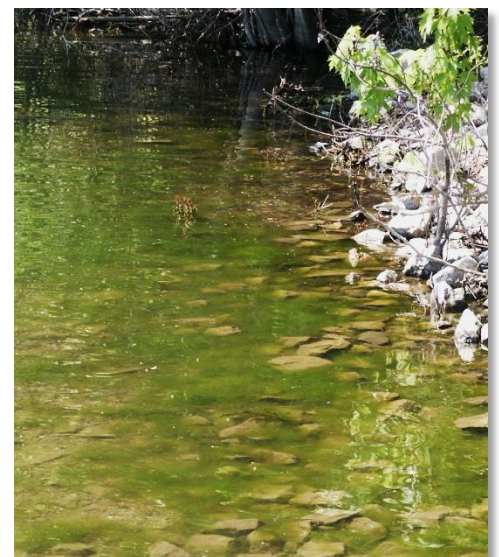
Algae growth is a natural occurrence in all waterbodies, with some lakes and ponds supporting larger algae populations than others. An algae bloom is a dense population of algae that may be spread throughout the water or concentrated at the surface. Similarly, a cyanobacteria bloom is a dense population of bacteria. There are many species of algae and cyanobacteria present in most waterbodies during the year, with some surviving all winter under the ice. As a result, an algae or cyanobacteria bloom can form at any time of the year, though most often they occur during hot weather in late summer. Like other aquatic plants, algae growth and cyanobacteria blooms can be stimulated by high levels of nutrients to the point where they become a nuisance. The only complete and long-term solution to nuisance algae growth is to locate and reduce the source of nutrients to the pond. There is no way to permanently, or completely, eliminate algae and cyanobacteria from lakes and ponds, nor is it desirable. Without some algae and cyanobacteria, a lake or pond cannot support a healthy community of insects, fish, and predators.



Planktonic algae (left photo), or cyanobacteria, may appear as “pea soup” green water or colored particles suspended in the water. Some species may cause odors often described as fishy, musty or septic.

Filamentous algae (right photos) typically form large greenish-colored mats along the edges or bottoms of a pond.

Some may be slimy or cottony to the touch. These algae colonies can fill with gases and float to the surface in large masses.





Attached-erect algae are often mistaken for rooted aquatic plants. The most common genus, *Chara*, is commonly called Muskgrass or Stonewort. It has a musky or garlic odor and feels gritty due to calcium deposits on the plant. Another genus, *Nitella*, is very similar to *Chara* but is not crusty and does not have the characteristic odor. Dense low-growing mats of these two algae may cover the bottom of an entire pond.



Cyanobacteria (blue-green algae) can also form a surface scum ranging in color from green to bright blue. It is sometimes mistaken for spilled paint. Exposure to some of these species can cause skin irritations and upset stomachs. Some species are also capable of producing strong toxins. For this reason, surface scums of cyanobacteria should be avoided and reported to your town health officer. The following websites have more information on how to identify, report, and safely avoid cyanobacteria:

- [Vermont Department of Health: Recreational Waters](#)
- [Vermont Department of Environmental Conservation: Cyanobacteria in Vermont](#)

Reducing Nuisance Algae Conditions

Nutrients

Most algae and cyanobacteria will not become a problem unless there is a source of nutrients to support excessive growth. Identifying and eliminating nutrient sources is the key to long-term algae control. Begin by evaluating the surrounding land and identifying possible nutrient or sediment sources. Examples of potential sources include

- ❖ Animal manure
- ❖ Agricultural runoff
- ❖ Bare, exposed soil
- ❖ Areas of lawn, garden or farm fertilizer use
- ❖ Unstable stream banks or roadside ditches
- ❖ Faulty/failing septic systems

The presence of any of these can result in nutrients or sediment reaching a lake or pond.

Prevention

Filamentous and planktonic algae can best be controlled by preventative actions that limit the flow of nutrients to the lake or pond. Important steps you can take to reduce these sources are:

- ❖ Locate animal holding areas well back from waterways. Don't allow runoff from these areas to flow directly into streams and ponds.
- ❖ Locate septic systems at least 50 – 100 feet from surface waters. Conduct routine septic system maintenance.
- ❖ Reduce the use of fertilizers and, where possible, eliminate its use within 100 ft of streams or ponds.
- ❖ Whenever possible, leave a buffer strip of at least 100 feet around a waterbody. A vegetation mixture of trees, shrubs, and ground cover will provide for optimum treatment of overland runoff.
- ❖ Reduce channelized flow (except for existing streams) from land by encouraging flow to spread out and run through well vegetated areas.

Non-chemical Control

Muskgrass or stonewort can effectively be controlled by regular hand-pulling and raking. The use of hand-held cutter may also be effective in removing these forms of algae from the water. Additionally, the use of bottom barriers, large mats of material placed over the muskgrass, will help to control their growth by blocking sunlight. However, remember that the presence of these thick low-growing algae may help to stabilize bottom sediments and other, more obnoxious, plants from inhabiting the pond. The use of bottom barriers and powered equipment requires a permit from the VT DEC, Watershed Management Division.

Raking and hand gathering may also be useful for filamentous algae.



DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Watershed Management Division

1 National Life Drive, Davis 3

Montpelier, VT 05620-3522

Chemical Control

Chemical treatments of nuisance algae conditions are usually only a temporary solution. Aquatic algicides only kill existing algae and do not affect the nutrient sources that stimulate nuisance algae growth. Treatments usually must be repeated on a yearly basis to be effective, and in many situations, chemicals may not provide desirable results. In the case of cyanobacteria, chemical treatments should NOT be used on an existing bloom, as this may result in the release of toxins into the water.

All applications of algicides, require a permit from the VT DEC, Watershed Management Division. The only exemption to this requirement is for the use of copper compounds registered as algicides for the control of nuisance algae. Copper compounds registered as algicides may be used **without** a permit **only** if the proposed project meets the following criteria:

- a) The waterbody is **one acre or less** in size;
- b) The waterbody is located **entirely** on one individual's property (all the property surrounding the water must be owned by one person); and
- c) Any outlet from the waterbody must be **controlled for at least 3 days** after any treatment.

All other applications of algicides, which do not meet the exemptions noted above, can only be applied after a permit is obtained from:

Vermont Department of Environmental Conservation

Watershed Management Division

1 National Life Drive, Davis 3

Montpelier VT, 05620-3522

Telephone: (802) 828-1115

<https://dec.vermont.gov/watershed/lakes-ponds>

For more information, [visit our webpage.](#)