

# Blue-Green Algae in Delaware Freshwaters

## Frequently Asked Questions

### What are blue-green algae?

Blue-green algae, also known as Cyanobacteria, are one of the oldest forms of life on earth, with fossil evidence dating back over a billion years. They have characteristics of both algae and bacteria. For example, like algae, they undergo photosynthesis and produce oxygen. Like bacteria, they have a cell wall whereas “true algae” have a cell membrane. Individual units (single cells or colonies) of most blue-green algae are microscopic, including those of interest in Delaware.

### Why should I be concerned about blue-green algae?

Some commonly occurring freshwater blue-green algae can produce toxins. Toxins are chemical compounds that can be harmful to people and to animals.

### In Delaware, in what kind of waters do potentially-harmful blue-green algae occur?

In Delaware, potentially-harmful blue-green algae occur in “still” or “slow-moving” freshwaters. This covers ponds and lakes of all sizes and the upper parts of tidal rivers.



### What do blue-green algae look like?

Most commonly, water that has blue-green algae is murky and has a shade of green that resembles pea soup or the leaves of trees. Blue-green algae can form a layer of “scum” on the water surface. At times, this layer, often called “pond scum,” may be extensive and give the impression that paint has been spilled. At other times, the floating scum can be broken up into irregularly shaped ‘clumps’ ranging in size from less than an inch to several feet in diameter. The water and

scum can also exhibit combinations and shades of several colors including bluish-green, white, brown and red.

### What is an algae bloom?

An algae “bloom” can be defined as a rapid increase in the amount of algae in the water. The word “bloom” is commonly used to describe a water condition where algae are abundant. There are no official numeric standards or thresholds for determining that a given level of algae abundance is a ‘bloom.’ For microscopic algae, waters said to have a “bloom” generally have cell concentrations ranging from hundreds to millions of cells per milliliter (about a drop of water).

### When do blue-green algae blooms usually occur?

In Delaware, blue green algae blooms generally occur between June and October during which time a bloom may persist for days to weeks or months. Blooms tend to go away after the first significant cold-spell in the fall, which sharply decreases the water temperature.

**Where within a given pond, lake, or freshwater tidal river area is a blue-green algae bloom most likely to be found?**



The bloom is likely to cover the entire area of the pond, lake, or river. However, the density of the bloom and the presence of scum can vary according to environmental conditions. The scum is typically found in isolated areas of the water surface and at the shoreline of lakes and ponds because wind moves it around. At times, a shift in wind direction and an increase in waves may cause scum to disperse. In Delaware, blue-green algae conditions in the freshwater tidal portion of rivers

have not been studied. However, the concentrations and distributions are expected to be similar to ponds and lakes.

**Are blue-green algae blooms a new problem?**

No. In other parts of the world, scientists have documented blue-green algae blooms dating back to the 12<sup>th</sup> century. They have also documented their toxic effects on livestock for more than 100 years.

**Can I look at a blue-green algae bloom and tell whether it is toxic?**

No, some blue-green algae may produce toxins and some do not produce toxins at all. Of those that can produce toxin, concentrations can vary widely, within the same pond and lake, in different locations, and over periods of time (hours to days).

The only way to tell if blue-green algae are producing toxins is through laboratory testing.

**Can some areas of a pond that has a blue-green algae bloom be more toxic than others?**

Yes. Studies in Delaware and elsewhere have shown that the highest levels of toxin are most likely to occur where there is scum.

**What problems are associated with blue-green algae blooms in ponds and lakes?**

Blue-green algae blooms can cause water and shorelines to appear scummy and unattractive. These can also produce an odor that may be described as ‘swampy’ and unpleasant. They can discolor and reduce the clarity of water.

When large amounts of blue-green algae die, their cells sink to the bottom where they are broken down by bacteria. The algae cells are organic matter. Their decomposition requires oxygen. If the amount of organic matter is large enough, the amount of oxygen used by the bacteria may be so great that there is not enough oxygen left in the water to support fish and other aquatic life. A fish kill may result.

### **Are blue-green algae harmful to people?**

Some species of blue-green algae can produce toxins. Toxins are chemical compounds that can be harmful to people and to animals. Blue-green algae may not produce toxins all of the time and it is not possible to know if and when they are producing toxin. The only way to find out is through laboratory testing.

When the algae cells die, they break apart and by doing so release any toxin into the water. Direct contact with water containing toxin, such as contact with the skin; swallowing water, such as when swimming, playing, or accidentally falling into the water; or by inhaling aerosol containing toxin released by the cells through physical disruption related to, water skiing, and high speed motor boating. People and animals nearby may breathe the spray and be affected by the toxin.

### **How can people be exposed to a toxin from blue-green algae?**

People can be exposed in several ways – by swallowing water with algae, by inhalation of water droplets containing algae cells and by direct contact with the skin.

### **What types of activities carry the greatest risk of causing illness?**



Any activity that can result in swallowing water and /or inhaling droplets of water carry the greatest risk.

### **Has Delaware had any cases of illness in people or animals associated with blue-green algae exposure?**

No cases of illness in people or animals associated with blue-green algae exposure have been documented in Delaware.

### **Can blue-green algae make people ill?**

Exposure to toxic blue-green algae can cause a person to feel ill. Different species of blue-green algae produce different types of toxins that can affect different systems in the body - nervous system (neurotoxins), renal system (nephrotoxins), liver (hepatotoxins), and gastrointestinal tract (gastrointestinal toxins), and skin and mucous membranes (dermal and epithelial toxins).

### **What are the signs and symptoms following exposure to a blue-green algae toxin?**

Symptoms are related to the extent of exposure, route of exposure, and the type of toxin. This can include skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, blisters of the mouth and liver damage, and allergic reactions, such as asthma, eye irritation, rashes and blisters around the mouth and nose.

### **Are children more vulnerable than adults?**

Yes, children have a greater risk than adults because children are more likely to swallow water when playing and because they put their fingers in their mouths without washing during and after playing outside. Because children have low weight, exposure to smaller amounts of toxin may result in undesirable health effects.



### **Is it safe to swim, boat, and water-ski in ponds or lakes that contain algae or algae scum?**

Because it can be difficult to know for sure that the algae in a pond or lake is actually blue-green algae and because it is not possible to continually determine if blue-green algae are producing a toxin, people should use common sense when recreating in a pond or lake that has pond scum.

If pond scum is present, do not wade, swim, boat, or water-ski in that area of the pond or lake. If moist or dried scum is noticeable along the shoreline, do not allow your children or pets to play in that area of the shoreline.

### **Can I eat fish from water containing blue-green algae?**

Yes. However, fish from waters where a blue-green algae bloom is present can have a very undesirable taste.

In Delaware, some waterways have state advisories for fish-consumption. These can be found at <http://www.fw.delaware.gov/Fisheries/Pages/Advisories.aspx>. In addition, since 2007, the general statewide fish consumption advisory remains in effect: *“Eat no more than one meal per week of any fish caught in Delaware’s fresh, estuarine and marine waters. This advisory applies to all waters and fish species not otherwise explicitly covered by an advisory.”*

### **Can I cook and wash food using water from a waterway in which there are signs of an algae bloom?**

No. Do not use the water. Boiling the water does not remove some algae toxins.

It is impossible to detect the presence of blue-green algae or its toxin by taste, odor or appearance.

### **Can I be exposed to blue-green algae or its toxin in my drinking water?**

Exposure to blue-green algae or its toxin is unlikely in Delaware drinking water sources. Many Delaware residents get their drinking water from a municipal drinking water source that treats the water to remove potentially harmful organisms and chemicals. Other residents have private wells that draw water from underground sources that do not have algae.

### **Are blue-green algae harmful to pets and livestock?**

Animals - wildlife and domestic animals - can become very ill or die after drinking water containing an algae toxin. Symptoms range from lethargy, loss of appetite, seizures, vomiting, convulsions, and even death. Dogs are particularly susceptible because scum can attach to the fur



and be swallowed during self-cleaning. It is advisable to keep dogs away from waters that may contain blue-green algae.

### **What can I do to protect myself from blue-green algae toxins?**

Use common sense whenever you are in a pond or lake. Avoid areas of water that have scum. Avoid shoreline areas that have moistened or dried scum. Please follow these advisories:

- Do not swallow water from a waterway.
- Avoid waters if there are signs of an algae bloom and you have a medical conditions such as immune system suppression or if you have asthma, hay fever, other allergy.
- Do not cook or wash food in pond water.
- Clean fish thoroughly with clean water and follow State fish consumption advisories.
- Do not let pets or livestock drink or go into water that has scum or go into the moistened or dried scum along the shoreline.
- Do not swim, water ski, play or wade in areas that have algae scum.
- Avoid contact with scum while boating or fishing from the shoreline. If contact with scum is unavoidable, wear gloves to prevent skin exposure and wash as soon as possible with clean water.
- Do not feed waterfowl in or near areas that have scum.

### **What should I do if exposed to blue-green algae scum?**

- If scum-laden water is swallowed and you or your pet becomes ill, call your family doctor or veterinarian.
- If skin is in contact with scum, wash thoroughly with clean water.

### **What can I do to help reduce the intensity of blue-green algae blooms in ponds, lakes, and other waterways?**

There is no quick, easy, or guaranteed remedy for controlling blue-green algae once blooms begin to occur. It should be expected that efforts to do so will probably be long-term (years) and will require the participation of many organizations and the community.

Avoid using chemicals to kill blue-green algae. As algae die after treatment with herbicides and algaecides in a pond or lake the toxins may be released into the water when the algae cells break apart.

The recommended course of action is to reduce the amount of nutrients that flow into our waters. Over time, this may reduce the frequency and duration of blooms and can be achieved by:

- Municipalities that:
  - Reduce the amounts of stormwater run-off.

- Reduce the amounts of sewage discharges.
- Homeowners who:
  - Fix leaky septic systems.
  - Limit the use of lawn fertilizer only to where and when it is truly needed and in the recommended amounts.
  - Prevent yard debris (e.g., leaves, grass clippings, etc.) from washing into storm drains.
  - Support local ordinances that require silt curtains for residential and commercial construction sites.
  - Plant and maintain vegetative buffer strips along shorelines of lakes, ponds and streams.
- Farmers who:
  - Develop and implement nutrient management plans that are approved by the Delaware Nutrient Management Commission.
  - Routinely monitor the application of chemicals and nutrients on land
- Golf courses and commercial lawn care companies that:
  - Develop and implement approved nutrient management plans
  - Routinely monitor the application of chemicals and nutrients on land
- Remember – “Reduce, Reuse and Recycle”