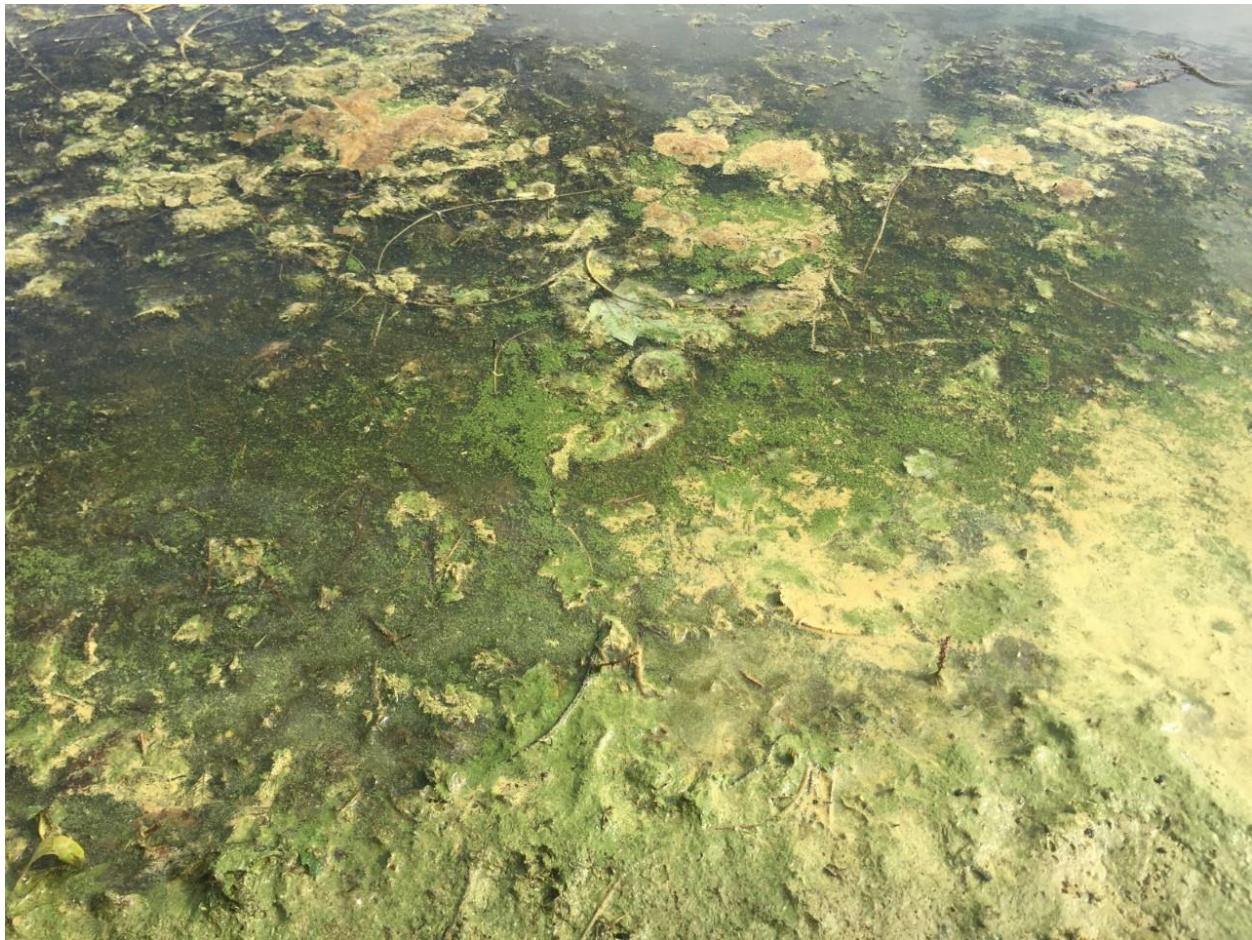




Common Cyanobacteria Bloom “Look-Alikes” in Freshwater Lakes, Ponds, and Streams



Dense shoreline collection of duckweed, pollen, and assorted aquatic plants, Spring Lake, Avon, CT.

Introduction:

The Connecticut Department of Energy and Environmental Protection frequently receives reports of suspected cyanobacteria blooms, which after investigation, turn out to be naturally occurring phenomenon that have a very similar appearance to a cyanobacteria bloom. These cyanobacteria “look-alikes” are very different from the microscopic organisms responsible for potentially harmful algal blooms. The three most common naturally occurring “look-alikes” reported as suspected cyanobacteria blooms are pollen, duckweed and other aquatic plants.

Pollen:

During the spring and summer months, pollen can often be confused with cyanobacteria blooms on the surface of rivers, lakes, and ponds, as well as [Long Island Sound](#). Pollen grains are very buoyant and are easily carried through the air to water surfaces where they can collect and float in large slicks¹. Many different kinds of plants and trees release their pollen across the U.S every year. In Connecticut, pollen season typically starts in the Spring (May and June) with trees such as birch, maple, oak, juniper, and pine² producing waves of pollen, which tend to leave heavy coatings. If you see heavy coatings of pollen on your vehicle, this is a good reminder: it is pollen season. Some weeds and grasses are primarily responsible for pollen releases experienced throughout July and August. Transitioning into the fall, weeds such as ragweed and sorrel produce heavily in August through September.

Weather has a large impact on the distribution and severity of pollen. On a day to day scale, precipitation can quell airborne pollen by washing it into soils or rivers, lakes and ponds, and Long Island Sound. Depending on wind direction and human activities such as boating, wind and waves can cause pollen to concentrate against shorelines or in coves of lakes and ponds. This is often when pollen is mistaken for cyanobacteria because it looks like the typical paint slicks or shoreline concentrations of a cyanobacteria bloom. As global climate change continues, the amount and variety of pollen will likely increase as trees and plants expand their habitat ranges³.

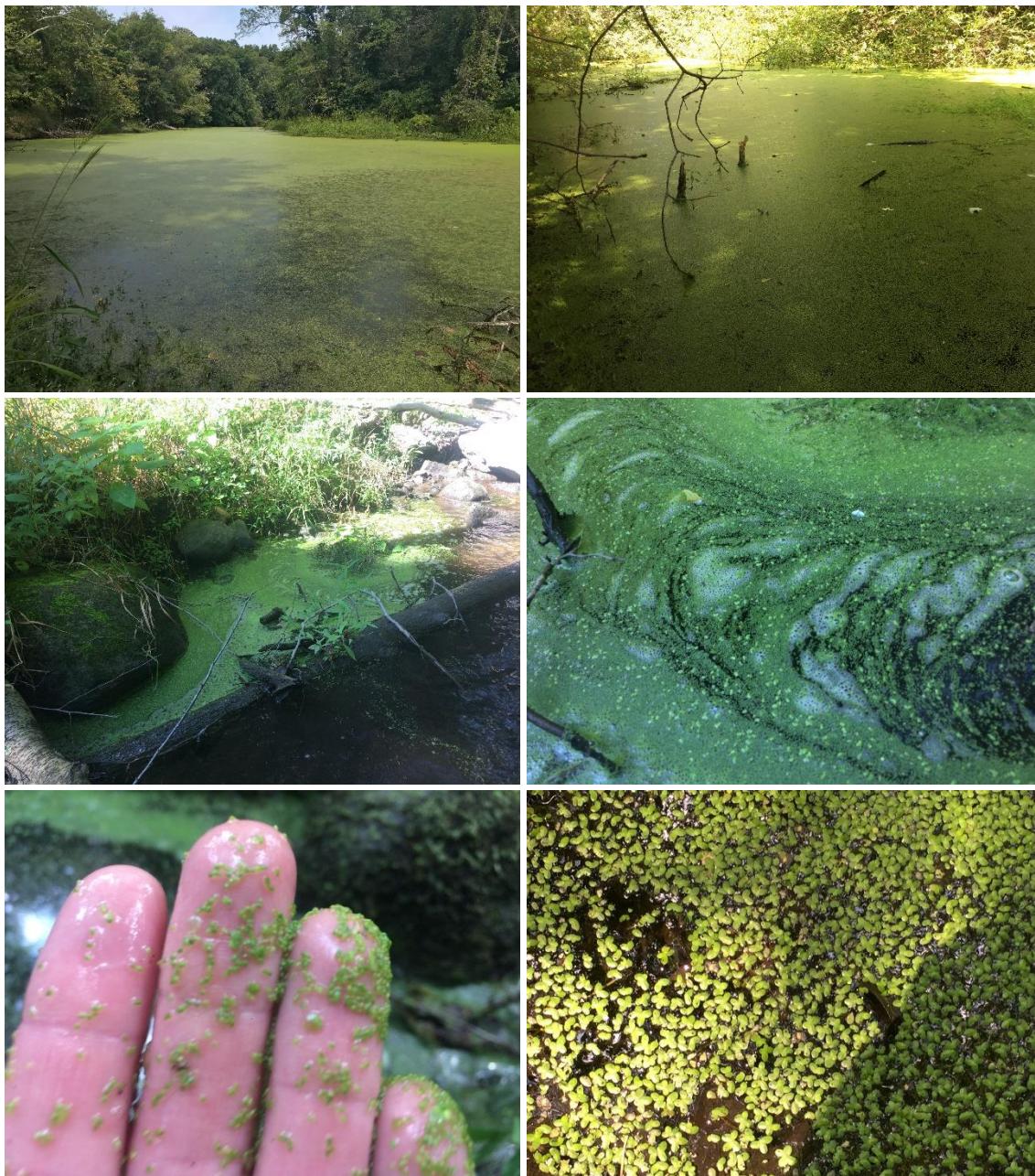
To get a sense of how much pollen can come off of a single tree, [Smithsonian Magazine](#) has a great article with a video that shows a backhoe taping a tree.



Pollen shoreline aggregations and scum formations (top, middle, and bottom left). Pollen mixed with aquatic plants along a swimming area (top right). Pollen concentrating in cattails at Stratton Brook State Park, Simsbury, CT (middle right). Pollen accumulating against a buoy line at Lake Waramaug (bottom right).

Duckweed:

Another common look-alike to cyanobacteria blooms are duckweed patches. Duckweed is an aquatic plant⁴ that floats on the surface of lakes, ponds, and slow-moving fresh or brackish waters⁵. Duckweed is composed of four genera ranging in size from 2 mm (*Wolffia* species) up to 15 cm in diameter⁶. On a large scale, the aggregation of the small leaves can create an expansive floating mat, covering the surface in a similar manner to a cyanobacterial mat. However, upon closer inspection, duckweed can be easily distinguished by its leaves and roots.



Duckweed in Curtiss Park, Simsbury, CT (top left). Continuous duckweed (top right). Duckweed concentrating in Dibbles Brook, Bethel, CT (middle row). Individual duckweed up close from Dibbles Brook (bottom left). Individual duckweed aggregated across the waters surface (bottom right).

Other Aquatic Plants:

Aquatic plants can often be confused with cyanobacteria blooms because of the extensive variation which occurs within the group. Aquatic plants grow in both fresh and marine water systems and can vary in shape, color, and size. They can grow above, below, or float on the waters surface. Although aquatic plants may appear to be similar to terrestrial plants, they are very different in their structure and the way they function. Aquatic plants and algae can include seaweeds, phytoplankton, and pond scums such as filamentous algae (*Cladophora* and *Spirogyra*)^{7,8}. As a general rule, algae are structurally simple, organisms that contain chlorophyll, a green pigment which facilitates light absorption and helps them produce their own nutrients (autotrophic). The most distinguishing physical characteristic which delineates aquatic plants from cyanobacteria, is their size.

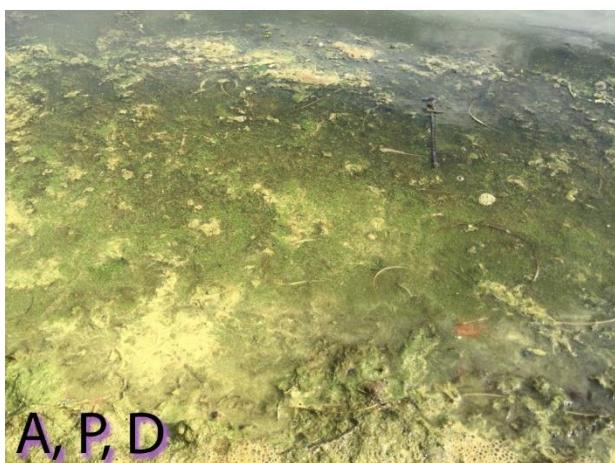


*Aquatic Plant, *Cladophora*, growing in Lyman Brook (top left). Other Aquatic plants in Lyman Orchards Pond in Middlefield, CT (top right). Wrack lines of aquatic plants and shoreline scum at Burr Pond, Torrington, CT (bottom left). Aquatic plants washed up against a bathing beach at Indian Well State Park, Shelton, CT (bottom right).*

Who's who?

In the following images, can you identify the common cyanobacteria bloom “look-alikes” as either aquatic plants, pollen, duckweed, or a combination?

A=Aquatic Plants, P=Pollen, D=Duckweed, C=Cyanobacteria



Cladophora Algae in Penwood State Park, Bloomfield, CT (top row). Aquatic plants, Pollen, and Duckweed in Spring Lake, Avon, CT (middle left). Pollen on aquatic plants in the Farmington River, Avon, CT (middle right). Pollen on a street puddle, CT (bottom row).



Pollen around Spring Lake, Avon, CT (top row). Pollen on aquatic plants in Spring Lake, Avon, CT (center row and bottom left). Close up of a Duckweed, CT (bottom right).



A, C

Cyanobacteria "clumps" with aquatic plants at Indian Well State Park, Shelton, CT.

Still unsure if the phenomenon you are observing is a cyanobacteria “look-alike”?

- Try using a simple jar or stick to “test” for cyanobacteria as describe by the [Kansas Department of Health and Environment](#)⁹

- If you wish to report a suspected bloom:

Contact the CT DEEP at (860) 424-3028 or send inquires to deep.algalblooms@ct.gov
The CT Department of Public Health (860-509-7758)
Contact your [Local Public Health Agency](#)

- When reporting a suspected bloom include as much information about the phenomenon and location as possible. Pictures are an invaluable tool for staff working to monitoring and assess incidents.
 - The date
 - Your name or affiliation
 - Your contact information
 - Location of the incident
 - Street address and town
 - A text description of the location if not obvious (example: at the end of the cul-de-sac on Ridge Rd)
 - Coordinates, if you know them
 - Pictures
 - General location pictures
 - Landscape picture(s) of the material in question
 - Up-close picture(s) of the material in question
 - A description of the event or the material in question
 - If you collected a sample

Keep in mind the phenomenon in this document are not the exclusive cyanobacteria “look-alikes”. Some algal species can be nearly indistinguishable from cyanobacteria unless assessed by an expert under a microscope.

Thank you for doing you part to keep Connecticut’s Waters Safe and Clean!

References:

1. [Interpreting the Function of Saccate Pollen in Ancient Conifers and Other Seed Plants](#)
2. [Seasonal allergies Q & A with Dr. Tao Zheng](#)
3. [Allergenic pollen season variations in the past two decades under changing climate in the United States](#)
4. [EPA- What are macrophytes](#)
5. [Duckweed - a potential high-protein feed resource for domestic animals and fish](#)
6. [Floating Aquatic Plants- Duckweeds](#)
7. [Algae](#)
8. [Filamentous Algae](#)
9. [Information for Private Waterbody Owners](#)