

Utah Water Watch Tier 1 Harmful Algal Bloom Monitoring Guide

Background: Many types of alga exist in lakes. The water may be brownish yellow from single-celled diatoms, or covered with floating mats of filamentous green algae. Cyanobacteria, primitive photosynthetic colony-forming bacteria, are too naturally part of the phytoplankton diversity of lakes and ponds. With any algae, when conditions “ripen”, blooms (large growths) can occur. **Cyanobacteria, however, are capable of producing harmful toxins; a cyanobacteria bloom is referred to as a harmful algal bloom (HAB).** Harmful algal blooms occur in reservoirs, lakes and pond, especially those with warm, phosphorus rich waters.

Why we monitor HABs: While harmless in small concentrations, blooms – large growths - can produce toxins that can be deadly for humans, pets and livestock. Tier 1 volunteers are trained to identify a potential bloom and collect a sample for further analysis.

What influences HABs: Harmful algal blooms tend to occur in warm waters that are nutrient enriched. Often as reservoirs are drawn-down in the summer, blooms occur. Nutrients can enter a lake through runoff (agricultural, urban or suburban) or from wastewater treatment plants. Utah – unlike many states - does not currently set standards for nutrients in discharge from sewage treatment plants, exacerbating the problem.

Methods: Volunteers first visit their

Options for algae in lakes: Volunteers are asked to survey for, and document the presence of, each of the following three types of algae. Further guidance is available on our website on how to differentiate HABs from normal algal growth.

1: Filamentous Green algae (not cyanobacteria)

It is very likely you will find **green algae** at your site. This alga can be filamentous, forming silky “clouds” below the surface or viscous mats on the surface. **While bothersome, filamentous green algae is harmless.**



Filamentous Green Algae

sources: Clemson U. (L), NYS Department of Environmental Conservation (M, R)

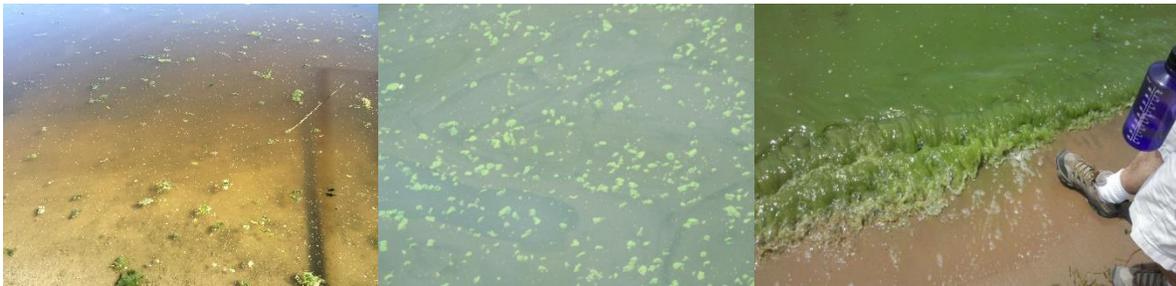
Confirming filamentous algae: The Stick Test

Source: Kansas Department of Health and the Environment

1. Find a long sturdy stick.
2. Put on rubber or latex gloves before attempting to retrieve a sample of the green material from the pond to prevent skin exposure.
3. Drag the stick through the surface mat and slowly lift out of the water. a. Make sure you do not fall into the water while attempting to retrieve material.
4. Look at the end of the stick to see what came out of the water.
 - a. If the stick comes out looking like it has been thrust into a can of paint, the mat on the pond is likely to be a blue-green algae scum.
 - b. **If the stick pulls out strands that look like green hair or threads, the mat on the pond is likely filamentous green algae (non-toxic)**

2: Water column (potentially cyanobacteria)

Many types of phytoplankton live in the water column. Normally, they are hardly visible. The occasional small (1mm) green clump (cyanobacteria colony) is also not a cause for concern. **A bloom is when the water is abnormally colored, (green or brown usually), due to the overwhelming abundance of an algal species.** The water has been described as looking like “pea soup”. Collect a sample, further analysis will tell if it is cyanobacteria. If unsure, photograph the water body (close up and from afar, and email Utah Water Watch).



Algae in the water column

Sources: Raymond Li (L), Ohio EPA (M), NYS Department of Environmental Conservation (R).

3: Surface Scum (likely cyanobacteria)

Cyanobacteria, which unlike other types of algae are able to regulate their buoyancy and move throughout the water column, tend to float to the surface of the water. During periods of calm winds, thick surface mats can develop. These mats can be blue, green or white, and are often described as looking like spilled paint. **Any visible surface scum is considered a bloom.**



Surface scums

Sources: NYS Department of Environmental Conservation (L) Utah Health Dept. (M,R)

Method:

1: Algae observed in the lake? Mark yes if any algae, regardless of type, was observed.

2: Types observed: Select each of these that was observed. See above for ID and definitions.

1: Filamentous green algae, 2: water column, 3: floating scum

3: Harmful algae bloom suspected? Mark yes if you suspect a bloom, full bloom definitions above. Tier 1 volunteers should consider any algal growth that is not filamentous green algae to be a potential bloom. Blooms can either be a surface scum or distributed through the water column.

If you suspect a bloom, proceed to the Bloom Protocol

4: Bloom Protocol Followed? Y/N

5: Comments: including areas surveyed. Please record the places you looked for a bloom. Blooms frequently occur in a small portion of a water body. We recommend you walk the perimeter of a pond or visit each of the commonly recreated areas of a reservoir (beaches, boat launches).