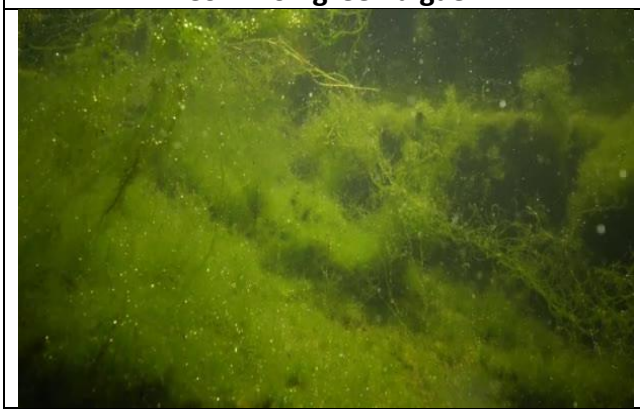
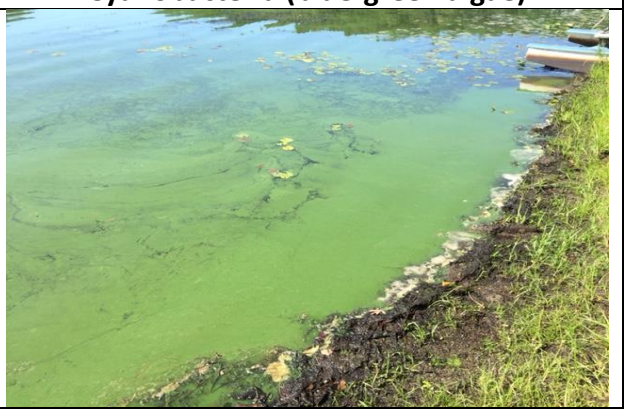
FAQ on Blue-green Algae (Cyanobacteria) Blooms and Sampling on Lake Samish

Q: What are blue-green algae (cyanobacteria) and what do they look like?

A: Blue-green algae, technically known as cyanobacteria, are actually not algae but a single-celled organism found naturally in lakes, streams and ponds. These organisms are a primitive form of bacteria capable of photosynthesis. When present in large numbers they may form visible blooms or mats that float on the surface or suspended in the water column. A bloom can look like bright green, blue-green, brown, yellow, orange, or red paint, thick pea-green soup, white or brownish-red foam or scum. Generally, the difference in appearance between regular green algae and blue-green algae is that common green algae has some form/structure and may be filamentous; whereas blue-green algae generally has no structure and is free-flowing and or suspended in the water column.

Common green algae	Cyanobacteria (blue-green algae)
	

Q. What causes cyanobacteria blooms?

A. It's difficult to know the specific cause of any one individual bloom. While we know of many factors that may contribute to cyanobacterial blooms, how these factors come together to create a bloom is not well understood. However, in general, sunlight, warm water temperatures, still water, and high nutrient (nitrogen and phosphorus) concentrations favor the development of these blooms. Nutrients can be naturally occurring (such as from wildlife and decaying vegetation) or arise from human inputs (such as fertilizer runoff, manure, failing septic systems, or forest management activities). While cyanobacterial blooms have been occurring since early in Earth's history, global climate change is likely to increase factors that promote cyanobacterial growth. These factors are expected to increase the frequency and duration of cyanobacterial blooms.

Q. Do all cyanobacteria blooms produce toxins and what are the human health risks if they do?

A. No, most blue-green algae do not produce chemicals harmful to humans or animals. However, under certain conditions they can produce toxins which can be mildly irritating to skin, eyes, nose, throat and respiratory system, or more seriously affect the nervous system. Symptoms may include nausea, vomiting, diarrhea, rash, muscle cramps, twitching, and in extreme cases, acute liver failure, paralysis,

cardiac or respiratory failure, and death. Unfortunately, you can't tell if a bloom is producing toxins just by looking at it. Nor is the size of the bloom associated with the amount of toxins that can be produced. Because scientists don't know why or when cyanobacteria produce toxins it's impossible to predict when toxins are present unless sampling and testing is done. Over time, the toxins are diluted and eventually break down and disappear.

Q. What about risks to pets, wildlife and fish?

A. A toxic algae bloom can poison fish, birds, aquatic animals, livestock, wildlife, and household pets (such as dogs) that are near the water, consume the water, or swim in the water.

Large algae blooms can also cause harm by growing densely and blocking the sunlight from reaching the lower depths of the water. This can starve fish and plants of oxygen in the water when they decompose, resulting in fish kills and damage to the local ecology.

Q. What should I do if I see a large bloom on Lake Samish?

A. Contact the Whatcom County Health Department, Samish Water District, or visit the Lake Samish Association website at https://www.lakesamish.org/links and click on the link to "Report an Algae Bloom".

Q. Who will collect the sample?

A. During business hours, either the Whatcom County Health Department or Samish Water District staff will confirm the presence of cyanobacteria and collect a sample if deemed appropriate. After hours, a group of local residents have volunteered to collect samples. Samples are then sent to the King County lab for analysis.

Q. How/when will I know the results?

A. Testing normally takes about 48 hours before results are known. Whatcom County Health Department will post appropriate notifications in public locations at Lake Samish if necessary.

Q. In the meantime, what should I do?

A. Minimize your exposure to the bloom. Most people avoid a blue-green algae bloom because they tend to be icky-looking and smelly. It is important that pets and children are kept away from blue-green algae blooms. Children are generally more vulnerable to environmental toxins than adults. Boiling water does not remove or destroy these toxins; in fact, boiling the water could potentially release more toxins (if present) as the cell walls are destroyed.

Q. How do human activities influence algae growth?

A. Humans impact algae growth in the following ways:
Increased nutrients in the water - Nitrogen and phosphorous are two nutrients that can cause a cascade of negative effects in lake ecosystems. The main sources of these nutrients are agriculture through

manure and fertilizer, storm water, which carries pollution to the lake through creeks and ditches, septic systems, and household sources like fertilizer, pet waste, etc., and fossil fuels.

Removal of vegetation in the watershed - Removing vegetation and disturbing the ground during building, development, logging and other land-clearing activities loosens and exposes soil, which is full of nutrients. Then, wind and water carry soil and nutrients downhill to rivers and streams. In addition, the particles suspended in cloudy water absorb more heat. Additionally, lakeside plants and trees provide shade near the shoreline. Removing lakeside vegetation may encourage algae growth by increasing the amount of light that reaches shallow areas of the lake-shore, increasing photosynthesis in the algae and further warming areas where algae typically grow.

Climate change may also increase the frequency and occurrence of harmful algae blooms or cause them to be more severe in both freshwater and marine waters.

Q. What can we do to help lessen algae blooms in the future?

A: Blue-green algae thrive in warm, stagnant waters that have significant concentrations of nutrients. Steps should be taken to control nitrogen and phosphorous from entering the water body through fertilizer runoff, septic systems and other sources. Specifically:

- Maintain or restore lakeside vegetation buffer on your property to filter incoming water
- Use Lake Friendly practices when you landscape, use native plants, reduce or eliminate the use of fertilizer
- Pick up and properly dispose of pet waste
- Select phosphate-free detergents, soaps, and household cleaners
- Ensure that your septic system is functioning properly
- Move animal feedlots and corrals away from the shoreline
- Use storm water best management practices during construction
- Advocate for science-based management decisions that protect the watershed

Q: Where can I get more information about blue-green algae?

A: https://www.nwtoxicalgae.org/

https://www.cdc.gov/habs/general.html

https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/RECREATION/HARMFULALGAEBLOOMS/Pages/index.aspx