Blue-Green Algae and Recreation

What are they?

Blue-green algae are a diverse group of primitive aquatic organisms that are common in lakes, reservoirs, and ponds throughout the world. More correctly, scientists refer to them as **cyanobacteria**. They have many of the characteristics of other bacteria, but use the same photosynthetic pigment (chlorophyll-a) all advanced plant species have.

Why are they in my favorite lake?

Blue-green algae are a natural component of all aquatic ecosystems. Even in a very pristine setting, it may be common for blue-green algae to be the dominant algal type during the summer months, although they will be present in fairly small numbers.

In nutrient enriched lakes or ponds, **blooms** of blue-green algae can impair recreational uses or water supply. An algae "bloom" is the result of rapid population growth, which many species of algae can undergo if conditions are right. Most blue-green algae blooms appear as surface scums, clumps (colonies) floating in the water (which can look like grass clippings or curds of green cottage cheese), or simply a strong green color in the water. Very often, they are also accompanied by foul odors (septic, fishy, or petroleum-like odors are the most common).

Blue-green algae are adapted to a given environment, just as other organisms are. The conditions that most blue-green algae seem to flourish in include standing water (such as a pond or lake), warm water temperatures (as seen in the summer), and nutrient rich conditions (which increase when urban lands and agricultural activities are present within the watershed). The nutrient of most concern in fueling blue-green algae blooms is **phosphorus**, but nitrogen can be a secondary concern.

Blue-green algae, when these basic growth conditions are met, can be very effective in out-competing other types of algae. Many species can control their buoyancy, which allows them to readily form surface covering blooms, which can then concentrate along the windward shores of lakes.

Why should I be aware of blue-green algae when I swim or ski?

Many of the common blue-green algae have the ability to produce toxins. These biochemical poisons come in two main forms, hepatotoxins (that primarily target the liver) and neurotoxins (that target the nervous system). A large percentage of the public will report "allergic" type reactions after exposure to blue-green algae, such as intestinal problems, respiratory problems, or skin irritations. A number of these toxins have also been implicated as tumor promoting compounds, which makes chronic exposures (low exposure over time) a growing concern.

People are most at risk of exposure during blooms, when they engage in activities that might allow them to accidentally swallow water. Activities such as swimming, water skiing, wind surfing, or canoeing are examples of higher risk activities. However, even those recreating along the shore can experience allergic type reactions from wind borne aerosols coming off the water surface.

The exact conditions that make a bloom produce toxins is not understood at present. Therefore, it is best to assume a blue-green algae bloom is toxic until it dissipates or tests can confirm it is not toxic. Even if no toxins can be detected in a particular bloom, the aesthetic conditions associated with algae blooms will probably make most people think twice about recreating.

What precautions should I take? Can the problem be fixed?

In lakes with recreational use, a bloom will cause many people to think twice about swimming and boating. Most blooms look very unattractive and smell bad besides. However, areas where bloom material is collecting represent a greater risk of exposure to toxins. It is advisable that such areas be posted to warn the public to avoid any activities, that expose them to contact with the algae or water, until the bloom goes away. Be aware this may take a couple weeks to months if the lake is very enriched with nutrients. The areas where algal material collects may also change over time due to the prevailing winds and weather. Blooms often can appear to have gone away after a rain, only to visibly reappear in a couple days.

If you decide to engage in recreation in a lake where an algae bloom may be occurring, you should avoid swallowing water as much as possible. After being in the water, you can reduce your exposure by showering and changing out of wet clothing. Limiting the time mucous membranes (eyes, ears, nose, mouth) contact the water and algae will also reduce the risk of allergic reactions.

To correct the problem of excessive algae growth and blue-green algae blooms in lakes requires treating the cause and not the symptoms. There is no "magic bullet" that can be dumped in the lake to keep blue-green algae away after years of excessive nutrient inputs from upstream. The ultimate means to prevent these problems require protecting lakes from nutrient pollution. Reductions in nutrient pollution can be achieved through advanced wastewater treatment, management practices on farmland and pasture, and storm water controls. Effective nutrient management and reduction in most watersheds will require plenty of community involvement and education of the public.

Prepared in 2004 by:

Kansas Department of Health & Environment
Bureau of Environmental Field Services
Lake and Wetland Monitoring Program