

Rice Lake Radio Ad – August 2015 – Algae in the Water (Green Water)

More Information

Because of the water being carried into Rice Lake by Tuscobia Creek, Bear Creek, and the Red Cedar River, there is a lot of “food” for plant growth that washes into the lake every day. This plant food is in the form of nutrients like phosphorus and nitrogen, the same “food” that is on the labels of most fertilizers bought for gardens, lawns, and agricultural fields. This food in the water is essential to the growth of plants, but too much can lead to an over-abundance of vegetation. The weeds you see in the lake, and the green “stuff” you see suspended in the water, and the slime you see on the surface of the lake are all plants that are using the nutrients to grow. The small plants that are suspended in the water are mostly algae. There are some very small plants that are present as well, called duck weed. All are the result of too much food in the water. Warm summer days and lots of food in the water increases the level of large plant and algae growth. Rain events carry more food into the lake which in turns allows more plants and algae to grow. Most of the time this leads to an event called and algae bloom in a lake. That is what is happening on Rice Lake right now. Plants and algae are growing like crazy in response to the warm and sticky summer days we have been experiencing lately.

Many folks that live on and use the water of Rice Lake are concerned about something called “Swimmers Itch”. Swimmers itch is a rash that is caused by a combination of snail, waterfowl, water currents, and people. The rash itself is caused by a human’s allergic reaction to a microscopic critter that is swimming in the water looking for its appropriate host to continue its life cycle. We are not that host, so the critter ultimately dies and the skin rash develops. Swimmers Itch occurs world-wide, and Rice Lake is no more susceptible to it than any other body of water. It takes the correct combination of the appropriate waterfowl (usually one or two species of ducks, not geese), a particular species of snail (not the big Chinese Mystery Snails that are in the lake), and water currents that wash the microscopic critters into areas where humans recreate. Summer is typically the worst time for Swimmers Itch and in any given year there may be more or less incidents of Swimmers Itch.

Although not generally associated with good or bad water quality, more plants and more algae washed into a shoreline that people are swimming or wading in, and standing or stagnant water may increase the amount of critters in the water and thereby increasing the likely-hood that a person might get Swimmers Itch. A prime example of this is where the old City Beach is. A lot of water moves into the old beach area carrying the critter with it. Just because the critter might be present in one area does not mean it is present all over. It is very rare that someone develops Swimmers Itch while swimming in deep water or skiing or tubing in the middle of the lake.

In the following narrative more information is given about many of the things making Rice Lake green. A separate document is included discussing Swimmers Itch.

Algae

Algae have no true roots, stems, or leaves and range in size from tiny, one-celled organisms to large, multi-celled plant-like organisms, such as chara or muskgrass. Plankton algae, which consist of free-

floating microscopic plants, grow throughout both the littoral zone and the well-lit surface waters of an entire lake and what is most associated with a green color in the water. Other forms of algae, including stringy filamentous types, are common only in the littoral area. In lakes that have excessive amounts of nutrients, more toxic blue-green algae can develop further deteriorating conditions in a lake.



Planktonic algae
(green water)

Many species of algae are found in Wisconsin lakes and rivers. Algae act like other plants and convert sunlight into energy, forming the base of a lake's food chain. Algae are eaten by zooplankton, which are in turn eaten by small fish, then larger fish, and eventually the larger fish are eaten by birds, shore animals, and people. True algae are a vital part of lake systems; however, blue-green algae are not true algae. Blue-green algae are photosynthetic bacteria known as cyanobacteria, which can cause illness and death in humans and animals. While blue-green algae can convert sunlight into energy, they are not an important part of the food chain because most organisms prefer not to eat them.

What are algal blooms and why do they occur?

When environmental conditions are right, the algal population can grow quickly and a bloom can occur. A bloom is a sudden increase in algae cells in a certain area of water. Little wind, warm water, sunlight, and plentiful nutrients - especially phosphorus - all increase the chance that a bloom will occur. Warm weather patterns and large rain events that wash agricultural and residential fertilizers (which contain phosphorus) into the water can also jump-start a bloom. In Wisconsin, blooms typically occur during the warm-weather months between mid-June and mid-September. Lakes and rivers in Wisconsin can become cloudy with rapidly reproducing algae.

What should I do if I see a bloom?

People should use common sense when dealing with algae. It is impossible to tell from a visual inspection whether an algal bloom is toxic. The safest thing to do is to treat every algal bloom as if it could be dangerous. The following is a good list of precautions to take when the water in the lake you are at has a lot of algae in it.

- Do not swim or wade through algal scums.
- Do not let young children play in areas of the lake that have thick algal scum present.
- Do not boat, water ski or jet ski through algal blooms.
- Do not fish in areas of the lake where thick algal scum is present.
- Do not let dogs drink lake water in the area of an algal bloom.

- Do not let dogs eat algal scum, or lick it off their fur.
- Wash your dog off with clean water immediately if your dog swims or wades in water during an algal bloom.
- Always shower off with soap and water after swimming in any lake, whether an algae bloom is present or not.

What can be done to reduce the frequency and intensity of blue-green algae blooms?

There are no quick or easy remedies for the control of blue-green algae once they appear in a lake or pond. Reducing the amount of nutrients that wash into our lakes and ponds will eventually reduce the frequency and intensity of blue-green algae blooms, but it may take a long time and a lot of community involvement to effectively change the nutrient concentrations in a water body. This is because there may still be large amounts of nutrients in the sediment at the bottom that may continue to serve as food for the blue-green algae.

Regulatory agencies like the Wisconsin Departments of Natural Resources and Agriculture, Trade, and Consumer Protection are working with communities around the state to reduce stormwater runoff, and to encourage agricultural practices that reduce soil erosion while maintaining high crop yields. Locally, landowners and interested citizens can help minimize the problems associated with algal blooms by working together with partners in their watershed to reduce the amount of nutrients that reach nearby lakes, streams, and ponds. You can help reduce nutrient concentrations by promoting the following practices in your community:

- Use lawn fertilizers only where truly needed
- 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. Note: Native plants are much more effective at filtering runoff than the typical grass species found on residential lawns.

Nutrients

Nutrients in lakes serve the same basic functions as nutrients in a garden. They are essential for growth. In a garden, growth and productivity are considered beneficial, but this is not necessarily so in a lake. The additional algae and other plant growth allowed by the nutrients may be beneficial up to a point, but may easily become a nuisance.

The main nutrients of concern are phosphorus and nitrogen. Both elements are measured in several forms. Phosphorus can be measured as total phosphorus (TP) or as soluble reactive phosphate (SRP). SRP is also sometimes called phosphate (PO₄) or orthophosphate (ortho-P). SRP represents the fraction of TP that is available to organisms for growth.

Nitrogen can be measured as total nitrogen (TN), total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO₃), nitrite-nitrogen (NO₂) [these are usually measured as nitrate-nitrite-nitrogen (NO₃ – NO₂), or ammonia-

nitrogen (NH_4). TN is similar to TP and is used to represent the total amount of nitrogen in a sample. TKN represents the fraction of TN that is unavailable for growth or bound up in organic form; it also includes NH_4 . The remaining fractions, $\text{NO}_3 - \text{NO}_2$ and NH_4 , represent bioavailable forms of nitrogen. If they are summed, they can be compared to the SRP fraction of phosphorus.

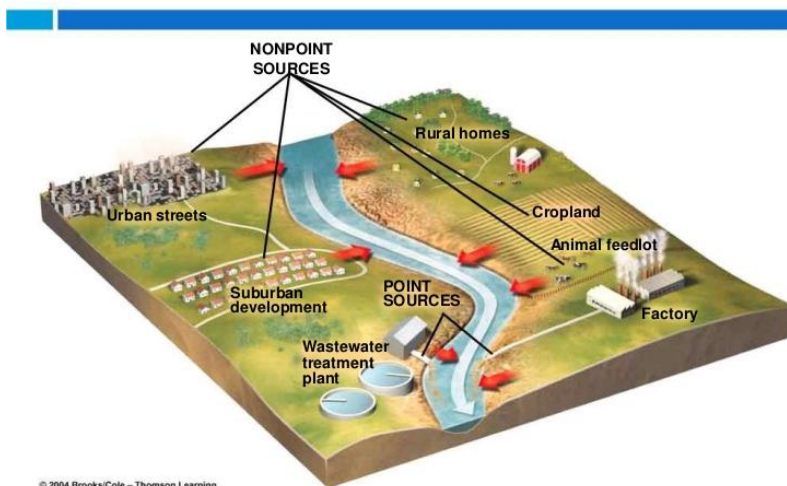
Sources of Nutrients and Other Water Pollution

Most sources of pollution to lakes contribute nutrients in one form or another. These sources include stormwater runoff, which may carry fertilizers from lawns and cropland as well as organic matter such as leaves, grass, and insects; waste products from farm animals and domestic pets; failing lakeside septic systems; and effluent from industrial and municipal wastewater treatment plants. As the number or size of pollutant sources increases, average nutrient concentrations also increase.

Sources of nutrients to a lake can be placed in two categories: **Non-point sources** and **point sources** of pollution. Point sources are easier to define and fix as they are things that you can actually point a finger too directly. Like a storm sewer pipe that leads directly into a lake, river or stream. Or a pipe that leads from a water treatment plant to a lake, river, or stream. The Environmental Protection Agency and state and local water resource professionals have done a good job in addressing point sources of water pollution. Where possible, these sources have been fixed or modified so they do not contribute as much of the excess nutrients as they once did. Waste Water Treatment plants do a good job removing nutrients from our household wastes from the water before putting it back in the lake, river or stream.

Non-point sources of pollution are much harder to manage. Even though we can see water running off the surface of the land and carrying pollutants into the lake, it is difficult to stop it because there is no one or two places to “point” too and then fix. Non-point pollution comes from farm fields, roads, our yards and homes, sidewalks and driveways, parking lots, stream bank and lake shore erosion and so on. Because the non-point contributions are so diverse and so spread out, it is difficult to “fix” all of them.

Sources of Water Pollution



Many things can be done to reduce non-point sources of pollution. Pick up trash, pick up pet waste, do not put grass clippings and leaves into the lake or street gutter where they get carried to the lake, fix cars and other vehicles that may be leaking oil and gas pollution, change farming practices to that the soil in the fields is not exposed to wind and water erosion for as long a period of time, install silt fences on building projects, use less hard surfaces that do not allow surface water runoff to soak into the ground, install rain gardens, rain barrels, surface water diversions, retention basins, native planting, shoreland buffers, and so on. Many people are working to reduce the amount of non-point pollution into our lakes, rivers, and streams. County Land Conservation Departments work extensively with farmers and other property owners to help guide them into better practices that can both maintain their bottom line, protect their fields now and in the future, and to improve water quality (reduce nutrients and sediment washed into the water). Even villages, towns, and cities can reduce the amount of polluted runoff that gets carried into lakes, rivers, and stream.



What is the Rice Lake Protection and Rehabilitation District doing to reduce nutrients coming into the lake?

Your Lake District is involved with many projects to reduce stormwater runoff polluted with excess nutrients and other bad things that get into the lake. The Lake District works with the City of Rice Lake, Town of Rice Lake, and Barron County to promote best management practices that will reduce nutrient loading to the lake, rivers and streams. The area of land that is drained by the local streams and rivers into Rice Lake is very large. This area, called a watershed covers ground from the dam on Bear Lake at Haugen; the dam on Long Lake that is the headwaters for the Brill River; and the dam on Red Cedar Lake

at Mikana. Tuscobia Creek, Little Bear Creek, Bear Creek, the Brill River, and the Red Cedar River all feed Rice Lake. Tuscobia Creek, Little Bear, and Bear Creek enter into Rice Lake through Stump Lake. The Brill River empties into the Red Cedar River just upstream of the Hwy M. There are many smaller, intermittent (meaning they don't have water flow all the time) streams and washes that drain agricultural fields and barnyards that empty into Rice Lake. There are several industrial parks and larger businesses that also contribute. The City of Rice Lake makes up a large portion of the lakeshore and many of the cities stormwater sewers drain to the lake without ever going through a waste water treatment facility.

Best Management Practices include many things from better farming practices to retention basins to curb cuts and grit chambers. The Lake District has a program that provides free planning and cost-sharing for property owners who wish to do something to reduce the runoff from their own property. The Lake District does educational events to promote better water quality in Rice Lake. They regularly monitor water quality and manage excessive aquatic plants. The District does what it can to keep Rice Lake healthy and an asset to the community and surrounding area.

Resources

<http://www.waterencyclopedia.com/Mi-Oc/Nutrients-in-Lakes-and-Streams.html>

<http://www.ecy.wa.gov/programs/wq/plants/management/joysmanual/nutrients.html>

<https://www.dhs.wisconsin.gov/water/bg-algae/defined.htm>

<http://dnr.wi.gov/lakes/bluegreenalgae/?a=1>

<http://naturalresources.uwex.edu/redcedar/>