



Photo Credit: Wesley Gerrin (Warnell Research and Outreach Professional)

## Investigating Algal Blooms: Important Questions for Landowners

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Algae in ponds can occur in three different forms: planktonic algae, filamentous algae, and macroalgae. Planktonic algal blooms are characterized by a green or blue-green coloration of the water and are made up of microscopic algae in water column (Figure 1; left). Filamentous algae include species of *Lyngbya*, *Pithophora*, *Spirogyra*, etc. and form thick mats on the surface of the water (Figure 1; middle). Macroalgae include species of *Chara* and *Nitella*, which attach to the substrate of a pond and resemble flowering plants (Figure 1; right).

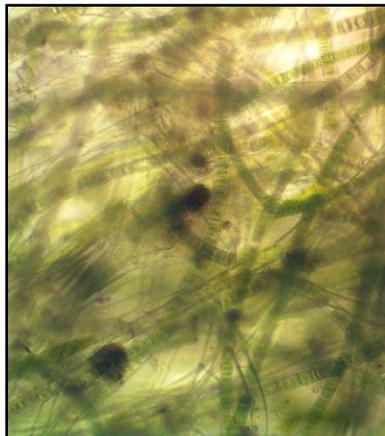
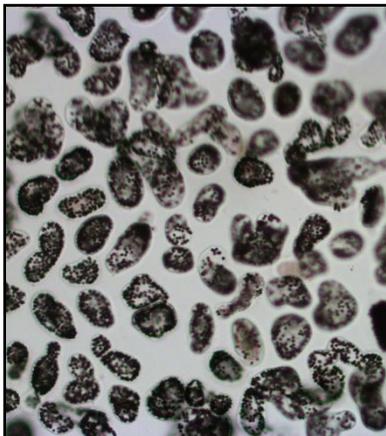


Figure 1. Examples of planktonic algae (left; *Microcystis sp.*), filamentous algae (middle; *Lyngbya sp.*), and macroalgae (right; *Chara sp.*). Photo Credit (left to right): Susan Wilde (Warnell Associate Professor), Wesley Gerrin (Warnell Research and Outreach Professional), Ashley Hoppers (Fannin/Gilmer County ANR Agent).

This document is intended for information gathering prior to recommendations. Answers to the following questions are critical for diagnosing algal blooms and will help streamline the process of treatment recommendations.

- What are the latitude and longitude coordinates of the pond?
  - Aerial imagery can be useful for determining surface area and understanding surrounding land use.
- What is the approximate surface area of the pond?
- What is the approximate maximum depth and average depth of the pond?
- What is the age of the pond? Have there been any renovations or modifications and when were they done?
  - Examples of modifications could include installation of a siphoning system or dredging to deepen the edges.
- What are the surrounding and watershed land uses for the pond?
  - Is the pond surrounded by forest, cattle farm, agricultural fields, pasture, or impervious surfaces? Algal blooms are caused by excess nutrients. Knowing the surroundings will help determine sources of excess nutrients that may be entering the pond.
- Is the pond fed by a spring, stream, or surface runoff? Could excess nutrients be entering the pond through its water source?
- Has the pond been fertilized recently or has fertilizer been part of the management regime in the past?
  - Fertilizer is a common management strategy for increasing productivity, but it is not always necessary and can contribute extra nutrients if not needed.
- Do livestock have access to the pond or the area immediately surrounding the pond? If they do not have direct access to the pond, how close can they get?
  - Livestock can contribute excess nutrients to ponds via their waste. Even if they do not have direct access to a pond, their waste can still enter the pond in surface runoff.
- Does the pond have a vegetative buffer or is it mowed all the way to the edge?
  - Vegetative buffers play a crucial role in preventing excess nutrients from entering ponds, especially when a pond is susceptible to nutrient rich surface runoff. A healthy vegetative buffer includes native riparian vegetation like sedges, rushes, buttonbush, alder, etc.
- Are the fish being fed (by hand or automated feeder)? What is their feeding rate? How many fish are in the pond?
  - Overfeeding fish can be a source of unnecessary nutrients that can contribute to algal blooms.
  - Overstocking can also result in overfeeding and exceedance of carrying capacity.
- Is this the first time an algal bloom has occurred, or is it a recurring issue?

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- **Have the algae been identified?**
    - A positive identification of the dominant algae is important for determining the best (if any) control method. The Pond Water Quality + Algal Screening (Test W34D) at the UGA Agriculture and Environmental Services Laboratory will provide a positive algal identification along with other useful water quality parameters.
  - **Good photos of the nuisance material in-hand are essential for proper diagnosis**

**Important Note:** There is no “silver bullet” solution for algae problems. Chemical treatments are often not a permanent or long-term solution and can lead to fish kills if not carefully done. Long-term control of algal blooms is best achieved through careful management of incoming nutrients and any existing nutrients within the pond.