

BE ON THE TEAM TO THINK DOWNSTREAM: ALGAE

WHAT IS ALGAE?

Algae refer to a diverse group of photosynthetic organisms found in various aquatic environments. The parameter of interest often involves the concentration and types of algae present in water bodies, as well as their biomass and chlorophyll levels. These aquatic species can be invasive, produce toxins, and deplete oxygen in stagnant water bodies if not maintained.

Algae can be persistent when there is a nutrient and dissolved oxygen imbalance in ponds. Photo by M.P. Hayes



WHAT AFFECTS THE PARAMETER?

Algae growth can be affected by the pH, temperature, water flow, available nutrients and light penetration in the water column. High concentrations of nutrients like nitrogen and phosphorus contribute to algal blooms which are best management practices for residential

and agricultural are important to implement. The balance of vegetation is critical for a healthy ecosystem. Some aquatic plants provide benefits for oxygen through photosynthesis, temperature buffering by shading and can stabilize edges, preventing erosion.

WHERE DOES IT COME FROM BROADLY AND SPECIFICALLY TO LOUISIANA?

Algae naturally exist in water bodies, including oceans, rivers, lakes and ponds, but increased levels of nutrients, particularly nitrogen and phosphorus, from agricultural runoff, urban runoff and wastewater discharges also promote algal growth. In Louisiana, the Mississippi River carries nutrient-rich runoff from upstream agricultural and urban areas, contributing to algal growth in Louisiana's water bodies. Louisiana's extensive coastal wetlands and estuaries also provide ideal conditions for algal growth, influenced by nutrient inputs from both natural and human sources. Additionally, residential ponds and stagnant canals, streams, and tributaries provide optimal conditions for algae growth. Though the Louisiana

Department of Environmental Quality's Water Quality Integrated Report does not identify algae as an impairment, introduction of non-native organisms (accidental or intentional) has been linked to aquatic plants as a source. In many cases, aquatic plants like algae are found in tandem with the following impairments around the state:

- Nitrogen
- Phosphorus
- Dissolved oxygen
- Temperature
- pH

HOW DOES IT AFFECT THE SURROUNDING ENVIRONMENT?

Excessive algal growth leads to eutrophication, or low dissolved oxygen levels in water, resulting in hypoxic conditions harmful to aquatic life. In addition to eutrophication, harmful algal blooms (HABs) produce toxins that can be detrimental to fish, wildlife and human health. These toxins can contaminate drinking water and cause illnesses. All of these effects can reduce biodiversity and

disrupt the balance of aquatic ecosystems. For instance, there are different types of algae, including planktonic and filamentous. Planktonic algae are associated with toxic conditions, while filamentous algae produce dense mats that limit oxygen exchange with the air, create stagnant conditions and can lead to clogging in water flow infrastructure.

WHAT ARE TRADITIONAL MANAGEMENT PRACTICES?

Like nitrogen and phosphorus management practices, reducing the concentration of excess nutrients that enter waterways is important. This can be through conducting soil tests prior to fertilizing yards and fields to promote accurate application and understanding landscape, which may increase drainage to waterways. Additionally, building a buffering zone around land where excessive nutrients run off will incorporate land-based plant nutri-

ent sorption. If nutrient management cannot be used, aerating water bodies using mechanical methods can reduce the effect of algae by adding oxygen to the water. In extreme cases, chemical treatment should always be done by a licensed applicator using a proper concentration of herbicide to minimize environmental impact. Chemical treatments only provide temporary control and usually a reactive response to algal blooms.

RESOURCES

<https://www.usgs.gov/mission-areas/water-resources/science/nutrients-and-eutrophication#overview>

<https://www.epa.gov/habs/learn-about-harmful-algae-cyanobacteria-and-cyanotoxins>

<https://www.epa.gov/habs/what-you-can-do>

<http://www.deq.louisiana.gov/page/louisiana-water-quality-integrated-report>

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