

### WHAT IS COLOR?

Water color is more than just a visual indicator but can be used as a measure of water quality and potential impairments. There are various changes in color depending on the source. This includes urban runoff (municipal and industrial effluent) versus natural runoff (agriculture and forested areas), which can have significantly different types of organic compounds, pollutants and treatment processes. The color of water is due to the presence of various dissolved and particulate matter from contributing sources.

Plant decomposition releases humic materials into water causing light brown coloration. Photo by M.P. Hayes



### WHAT AFFECTS THE PARAMETER?

There are many different color profiles that can be attributed to various sources. For instance, brown/yellow color can suggest organic matter known as tannins from decaying plants, leaves and soil. Red/orange coloration can signify iron oxides from piping or mineralized landscapes. Greenish/blue (especially in warm weather climates) can be an indicator of algae species. Black or

reddish-brown can suggest mineralization from manganese or iron. Each of the outlined colors above has many different sources, but can all contribute to the color of water in specific areas. Total suspended solids and turbidity can also cause chocolate cloudiness, which is seen during high rain events or in runoff.

### WHERE DOES IT COME FROM BROADLY AND SPECIFICALLY TO LOUISIANA?

In Louisiana, 2.1% of waterways are impaired because of color. This can be from various sources that produce a runoff from soil or a clay-based landscape. Additionally, areas of industrialization where water treatment occurs can lead to downstream color. The Louisiana Department of Environmental Quality uses the Water Quality Integrated Report to identify impairments and sources. The following sources were identified as causing color impairments around the state:

- Source unknown
- Natural source
- Silviculture resuspension or harvesting

## HOW DOES IT AFFECT THE SURROUNDING ENVIRONMENT?

The color of the water has a drastic impact on many water quality parameters. This includes light penetration, dissolved oxygen availability, plant growth, and food web disruption. Depending on the water color, visibility may

decrease, which causes issues for predator-prey dynamics and photosynthesis for aquatic plants. It is critical to understand the source of the coloring to determine mitigation strategies.

## WHAT ARE TRADITIONAL MANAGEMENT PRACTICES?

Management methods for water color vary depending on the source. For highly turbid chocolate water, buffering zones may be needed to capture sediment or clay running off the natural landscape. In other cases, green coloring may suggest algae growth, which needs nutrient reduction, aeration or chemical treatment. One of

the more unique cases is organic matter coloring from tannins. In some cases, stagnation of water will lead to plant decay, causing a water color change. In this example, water movement is crucial to maintain oxygen for processing organic material.

## RESOURCES

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

<https://www.usgs.gov/water-science-school/science/water-color>

<https://www.usgs.gov/media/images/color-water-can-affect-its-quality-and-usefulness>

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