

BE ON THE TEAM TO THINK DOWNSTREAM: TEMPERATURE

WHAT IS TEMPERATURE?

Temperature is the thermal energy concentrated in a water source. This energy has a warming or cooling effect on the water. The overall temperature of a water body will influence the metabolic rates and behavior of aquatic organisms playing a critical role in the environmental ecosystems.

Pond systems with vegetation promote shading and cooler water temperatures. Photo by M.P. Hayes



WHAT AFFECTS THE PARAMETER?

Many factors affect water temperature including the amount of solar radiation, the temperature of the air above the water, sedimentation, shading from

vegetation and velocity of water movement. Water temperature can also be affected by industrial cooling processes or discharges.

WHERE DOES IT COME FROM BROADLY AND SPECIFICALLY TO LOUISIANA?

In Louisiana, 2% of waterways are impaired because of temperature. Particles in the water are one of the most persistent causes of temperature impairments. The particulates absorb the sunlight, which increases the temperature of the system. These particles can get in the water from erosion, runoff or construction activities. The Louisiana Department of Environmental Quality uses the Water Quality Integrated Report to identify impairments and sources. The following sources were identified as causing temperature impairments around the state:

- Sources unknown
- Natural sources
- Silviculture harvesting
- Drought-related impacts
- Land development

HOW DOES IT AFFECT THE SURROUNDING ENVIRONMENT?

High temperatures can reduce dissolved oxygen levels and put stress on organisms leading to their deaths. Abnormal water temperatures can also disrupt the reproductive cycles of species that rely on temperature as a bioindicator. Another issue is transitioning temperature gradients, which may favor species that

were not prominent in the systems, a change referred to as species distribution. The distribution of the species in the ecosystem can affect the food web and habitat. All of these can disrupt ecosystems and have consequences on the environment.

WHAT ARE TRADITIONAL MANAGEMENT PRACTICES?

There are many ways to manage water temperature. Maintaining vegetation around bodies of water provides shade and reduces water temperature. Mixing industrial water with source water to cool discharge before it enters a body of water can reduce the thermal shock to ecosystem systems. Maintaining

streams so they can flow reduces water temperature because stagnant water warms more quickly than moving water. In Louisiana specifically, maintaining our wetlands can help reduce high water temperatures and increase our water quality downstream.

RESOURCES

<https://www.usgs.gov/special-topics/water-science-school/science/temperature-and-water>

<https://www.epa.gov/caddis/temperature>

<https://lacoast.gov/new/Ed/Curriculum/FunctionsAndValues.pdf>

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

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