

BE ON THE TEAM TO THINK DOWNSTREAM: **METALS**

WHAT ARE METALS?

Heavy metals like mercury, lead and cadmium can contaminate water sources through natural and industrial processes. Even metals with nutritional value can be toxic at high concentrations. Metals can be bound to clay, sand or organic matter from environmental systems and released into the surrounding environment during rain events. These naturally occurring metals include iron, aluminum, copper, manganese and zinc. Both particulate and dissolved metals are found in environmental systems.

Measuring metals is important for irrigation systems to prevent buildup and clogs. Photo by M.P. Hayes



WHAT AFFECTS THE PARAMETER?

Emissions and discharges from factories and plants; activities that disturb and release metals into water, like mining and drilling; metals deposited from the atmosphere through precipitation; and natural or human-induced erosion, all increase the concentration of heavy metals that end up in Louisiana's water bodies. It is important to understand the specific metal causing impairment to identify the proper source for mitigation techniques.

WHERE DOES IT COME FROM BROADLY AND SPECIFICALLY TO LOUISIANA?

In Louisiana, 9.7% of waterways are impaired because of metal, primarily mercury. Metals can enter water bodies through industrial discharges, mining activities, atmospheric deposition and the natural weathering of rocks. The Louisiana Department of Environmental Quality uses the Water Quality Integrated Report to identify impairments and sources. The following sources were identified as causing metal impairments around the state:

- Source unknown
- Natural source
- Atmospheric deposition

HOW DOES IT AFFECT THE SURROUNDING ENVIRONMENT?

Metals can be toxic to aquatic organisms, causing the deaths of fish and other aquatic organisms, reproductive issues and bioaccumulation that hurts prey or even human health. Biomagnification occurs through food web interactions as concentrations of metals increase as

larger organisms feed on smaller organisms with bioaccumulation. Metals can disrupt ecosystems by affecting species at various trophic levels. Many areas in Louisiana with mercury impairments have signs posted for safety that state “no fish consumption.”

WHAT ARE TRADITIONAL MANAGEMENT PRACTICES?

Enforcing limits on industrial discharges of metals and cleaning up contaminated sites through dredging and soil washing are steps that can be taken to mitigate and even prevent heavy metal pollution. While this goes with enforcing regulation, implementing best management practices in industries could reduce metal pollution. For

natural sources, buffering zones can help prevent leaching of soil into the water column. Additionally, where clay particles may erode into waterways, there are opportunities to build up edge profiles with plants to stabilize the creek or riverbanks.

RESOURCES

<https://www.ldh.la.gov/page/drinking-water-quality>

<https://www.epa.gov/mercury/basic-information-about-mercury#health>

<https://www.usgs.gov/mission-areas/water-resources/science/metals-and-other-trace-elements>

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

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