

BE ON THE TEAM TO THINK DOWNSTREAM: SALINITY

WHAT IS THE PARAMETER?

Salinity is the measurement of all dissolved salts in water, which includes mostly chloride, sodium, sulfate, magnesium, calcium and potassium. For water, the most common measurement is for sodium chloride (NaCl). Salinity is reported in concentration at the parts-per-thousand (ppt) level and can be seen in various sources of water including well water, rivers, streams and canals.

Coastal tidal zone promotes salinity gradients throughout coastal Louisiana. Photo by M.P. Hayes



WHAT AFFECTS THE PARAMETER?

Common occurrences for salinity come from horizontal (sea level rise and storm surges) and lateral (over-pumping and increased use of aquifers) intrusion. Seawater intrusion during high tides can increase salinity in wetlands or freshwater water bodies. Additionally, the overuse of well water can deplete

aquifers and pump from lower salt profiles creating saline irrigation water. Other environmental events including weather patterns and climate conditions lead to salinity changes. For example, evaporation can reduce water and concentration of salt content leading to increased salinity of ecosystems.

WHERE DOES IT COME FROM BROADLY AND SPECIFICALLY TO LOUISIANA?

Salinity is commonly associated with coastal Louisiana, but also impacts northern parts of the state from aquifer depletion. Natural sources like seawater intrusion, weathering of rocks and evaporation lead to salinity changes in waterways. Human activities where synthetic compounds are used including agricultural irrigation and industrial processes can also contribute. Louisiana's coastal location leads to significant salinity influences from the Gulf of Mexico. The Louisiana Department of Environmental Quality uses the Water Quality Integrated Report to identify impairments and sources. The following sources were identified as causing salinity impairments around the state:

- Natural sources
- Transfer from outside watersheds
- Silviculture harvesting
- Landfills
- Golf courses
- Forced drainage pumping

HOW DOES IT AFFECT THE SURROUNDING ENVIRONMENT?

High salinity levels can be harmful to freshwater species, causing osmotic stress and negatively affecting growth and reproduction. High salinity can degrade water quality, making it unsuitable for

drinking and irrigation. Changes in salinity can change ecosystem health by altering species composition and disrupting food webs.

WHAT ARE TRADITIONAL MANAGEMENT PRACTICES?

Constructing barriers to prevent seawater intrusion could aid in reducing the impact of salinity impairments in identified waterways. For the landscape, using more efficient irrigation methods to reduce runoff in addition to using vegetative buffers to filter the runoff would also decrease salinity. Additionally, proper application

techniques for fertilizer or landscape compounds with salts should be utilized to ensure minimal residual salts will leach into waterways. For additional information, LSU AgCenter has many publications dedicated to salinity in agriculture.

RESOURCES

<https://www.epa.gov/national-aquatic-resource-surveys/indicators-salinity>

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

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

<https://www.lsuagcenter.com/articles/page1729623324396>

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