5 things to know about the saltwater intrusion of the Mississippi River

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SPHTM Communications sphcomm@tulane.edu

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A view of the Mississippi River (photo by Gagliardy Photography via Canva)

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Rumblings of a water shortage have sparked a run on prepackaged water in the New Orleans area over the past several days, with Governor John Bel Edwards addressing that topic along with a broader discussion on saltwater intrusion of the Mississippi River Friday.

But what is really going on? And what do people need to know?

We reached out to Stephen Murphy, PhD, Director of the Disaster Management MPH Program in the Tulane School of Public Health and Tropical Medicine's Department of Environmental Health Sciences to get a better handle on the latest information available.

Here's what people need to know.

What is happening?

Heavier saltwater from the Gulf is moving upriver and displacing freshwater moving downstream because of the lack of rainfall in the Midwest during the past two months.

This lack of rainfall results in a river flow simply not powerful enough and deep enough to prevent the denser saltwater from moving inland and upriver.

With a sill "kicking up" the wedge off the bottom when it strikes it like a "ramp" of sorts, the wedge gets pushed upward into the flow of the river, which then has a better chance to push it back downriver. That said, the sill is designed to only buy more time and not meant to altogether prevent the saltwater wedge from proceeding upriver. The low flow remains the problem and the wedge will top the sill without more flow.

The Mississippi River was deepened to 45 feet in 1986 and to 50 feet in 2022 to accommodate the larger ocean-going vessels. This makes the riverbed in NOLA area much lower and the entirety of the MS River remains below sea level across the state.

Salt water in the Gulf of Mexico is denser than the fresh water flowing in the Mississippi River. Therefore, at low river flows, the Gulf's saltwater moves upstream along the bottom of the river underneath less dense river fresh water.

(It is also helpful to know that the movement of the saltwater wedge is less responsive to increases in flows than to decreases.)

When the river falls below 300,000 cubic feet per second, it cannot prevent salt from coming up from the Gulf of Mexico. Flows on the Mississippi River in our area could reach as low as 130,000 cubic feet per second. As of Sept 28, the flow rate remains approximately 145,000 cubic feet per second. Approximately 10 inches of precipitation across the Mississippi and Ohio River valleys, which might take months,

is likely needed to return the river to a high flow rate capable of driving the saltwater wedge back downriver.

Saltwater has impacted the area before. In 1988, the sill was built too late to keep saltwater from moving as far north as Kenner, which led to the Corps adopting rules now in place that triggered construction of the current sill in July.

What problems might we be facing?

Saltwater is projected to impact the New Orleans area in late October. Surface waters will exceed the U.S. Environmental Protection Agency public water supply standard as a secondary level of 250ppm chloride approximately 15 to 25 miles downstream of the saltwater wedge's front/toe. WHO drinking guidelines suggest that at approximately 200ppm, people will not want to drink it due to taste. Those with no-salts diets should not exceed 20ppm.

The New Orleans water system does not filtrate salt. When saltwater is pumped through a water distribution system it can cause pipes to corrode, potentially leaching heavy metals from the pipes and pipe fittings into drinking water. It is difficult to predict which metals might leach from pipes, as distribution systems are all different and full maps of water systems are not available. A priority of the response will likely include frequent testing of the water that is going through the water systems' distribution network.

Extended saltwater exposure can also lead to pipe failure, which has been the case with burst pipes in lower parish communities already due to exacerbated drought conditions in the soil/ground causing shifts combined with the weakening onset caused by the corrosive saltwater.

Agriculture concerns exist as well, with large acreage irrigated by the lower MS River as well as animal farms. Many farmlands downriver of New Orleans have already been impacted.

What is being done to combat the issue?

The underwater barrier, the sill, will be increased in size. It is believed to be 45 feet high in an area 90 feet deep, and will be increased to 30 feet below surface and extended outward beyond its present 1,500-foot length.

A 625 foot-long notch will be maintained in the sill to a depth of 55 feet below the water surface over the river's navigation channel to allow ocean-going vessels to continue to move up and down river, with special one-way traffic rules. Ocean-going vessels using the river are allowed to have a 50-foot-deep draft, deeper than the new elevated section of the sill if the notch was not built into it.

For the East Bank of New Orleans, a pipeline has been proposed to feed the New Orleans main water treatment facility with fresh water sourced 10-12 miles upriver, beyond the anticipated end point of the saltwater wedge. This fresh water will be sourced from a point upriver of a naturally occurring barrier – a change in the riverbed topography that experts believe will prevent high salt concentrations from advancing further. The best estimates indicate this pipeline would be able to blend with the higher salt concentrations and dilute the city’s water to an acceptable and drinkable level for most.

For the West Bank of Orleans Parish in Algiers, water will be barged in to be mixed with the local water supply to reduce its salt content to healthy levels.

In addition, officials will expand point of use testing to keep better awareness of the situation, while reverse-osmosis equipment will be utilized as part of the treatment process for water at smaller facilities in Plaquemines Parish.

The state is securing pre-made formula for WIC programs to reduce the impacts of potential higher salt content in water for infant formula.

Will my water still be safe to drink?

Yes. Water is safe to drink at present, though the EPA limits referenced above tell us that the taste of the water may eventually exceed the salt threshold that many will want to bear. However, it is important to remain aware of the situation. The proposed pipeline solution might provide enough freshwater volume to dilute any intrusion of water with higher salt concentrations.

Excess sodium from salt in the diet increases the risk of high blood pressure and cardiovascular disease. For most healthy people, a sodium level of 100 milligrams per liter of water will not substantially increase risk. Individuals on a low sodium diet due to high blood pressure or other health problems, are more restricted to water within the 20 milligrams per liter standard. However, it should be noted that in the case of slightly elevated salt concentrations in the City’s water (yet at levels still

safe to drink), those on low-salt diets should explore additional food-based ways to remain at safe salt levels, as food-based alternatives are much easier and cheaper than altering water sources.

If higher concentrations persist over a longer term, then the corrosive impact on pipes and appliances may be more severe, which may need to be mitigated by lowering usage.

What should I do and what shouldn’t I do?

Making a run on water is ill-advised at the moment. Many store shelves are already empty, but supply chains will restock them soon. Again, the water is safe, currently. That said, being mindful of your water is always important. Keeping a supply of it for storm-related issues is smart and perhaps augmenting that slightly would be smart as well.

Stay tuned to news and health experts. Be aware of salt-sensitivities in your family and react accordingly should it be warranted.

The official source of Tulane-related emergency information is tulane.edu/emergency. Please visit this page for additional information.