Impact of drought on drinking water contamination: Disparities found affecting Latino/a communities

August 7 2024

A new study suggests that community water systems in California serving majority Latina/o communities are more susceptible to nitrate contamination. Credit: Berkeley Lab from Openverse

Long-term exposure to contaminants such as arsenic and nitrate in water is linked to an increased risk of various diseases, including cancers, cardiovascular diseases, developmental disorders and birth defects in infants.

In the United States, there is a striking disparity in exposure to contaminants in tap water provided by community water systems (CWSs), with historically marginalized communities at greater risks compared to other populations. Often, CWSs that distribute water with higher contamination levels exist in areas that lack adequate public infrastructure or sociopolitical and financial resources.

In a study published in the *American Journal of Public Health*, Ms. Sandy Sum, a Ph.D. candidate at the Bren School of Environmental Science & Management, UC Santa Barbara, investigated the drinking water quality in California's CWSs serving majority Latino/a communities.

Ms. Sum analyzed trends in nitrate and arsenic concentrations in drinking water sourced from both surface and groundwater, using a varied set of data, including water sampling data, historical drought records, sociodemographic characteristics of the populations, measures of agricultural intensity and CWS characteristics from the period 2007–2020.

Her study found that these systems consistently exhibit higher and more variable levels of nitrate and arsenic compared to those serving non-majority Latino/a populations. She also found that instances of drought increased the contamination in CWSs serving these communities.

"Drought increased nitrate concentrations in majority Latino/a communities, with the effect doubling for CWSs with more than 75% Latino/a populations served. Arsenic concentrations in surface sources

also increased during drought for all groups," explains Ms. Sum.

Nitrate concentrations in groundwater-sourced drinking water increased from a baseline of 2.5 mg/L in 1998 to a peak of 3.1 mg/L in 2018 for majority Latino/a CWSs.

In contrast, nitrate levels in non-majority Latino/a CWSs decreased from 2.1 mg/L to 1.8 mg/L over the same period. This widening disparity in nitrate exposure is particularly pronounced in surface-sourced water, where majority Latino/a CWSs show a mean nitrate concentration of 2.2 mg/L, significantly higher than the 1.2 mg/L observed in non-majority Latino/a CWSs as of 2020.

Drought conditions exacerbated these disparities, with a notable impact on surface-sourced drinking water. For majority Latino/a CWSs, drought conditions led to an increase in nitrate levels, with a 2-unit increase in the normalized drought index resulting in a 0.04 mg/L rise in nitrate concentrations for CWSs serving more than 25% Latino/a populations.

The increase is more pronounced in systems serving over 75% Latino/a populations, with a 0.16 mg/L rise. This effect is particularly evident in very small (

Citation: Impact of drought on drinking water contamination: Disparities found affecting Latino/a communities (2024, August 7) retrieved 8 August 2024 from https://phys.org/news/2024-08-impact-drought-contamination-disparities-affecting.html