

# Unveiling the hidden threat: Drought-induced inelastic subsidence in expansive soils

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GPS array at the University of Houston Coastal Center, which has been continuously operated for 10 years, providing first-hand observations for the study. Credit: University of Houston

A journal article published by University of Houston Department of Earth and Atmospheric Sciences researchers highlights a significant, yet often overlooked, environmental concern—permanent losses in land surface elevation due to inelastic compaction of expansive soils during prolonged droughts. The findings appear in [Geophysical Research Letters](#).

The study, led by geophysics Ph.D. student Jennifer Welch, along with Professor Guoquan (Bob) Wang and four [collaborators](#), utilized a decade of GPS data from the University of Houston Coastal Center. The team observed notable land elevation loss during dry summers.

This [phenomenon](#) is primarily attributed to the inelastic compaction of expansive soils, widely distributed along the Texas [coastal area](#).

"It presents a novel challenge in evaluating coastal flooding risks and sea-level rise projections," Wang said. "The research underscores the urgent necessity to incorporate this factor into coastal infrastructure planning, wetland conservation efforts, and climate adaptation strategies."

**More information:** Jennifer Welch et al, Unveiling the Hidden Threat: Drought-Induced Inelastic Subsidence in Expansive Soils, *Geophysical Research Letters* (2024). [DOI: 10.1029/2023GL107549](https://doi.org/10.1029/2023GL107549)

Provided by University of Houston

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