



# GEOGULF2021

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## Observed and Potential Land Subsidence in the Gulf Coast Aquifer of Montgomery County, Texas

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### ABSTRACT

With the land sinking more than 3 m in some places, land subsidence in the Greater Houston area due to fluid extraction from the subsurface is a management issue with consequences for aquifer storage, submerged lands, increased frequency and severity of flooding, collapsed water well casings, damage to building foundations, and damage to public infrastructure such as roads and bridges. Minimizing land subsidence involves switching water sources from groundwater to more expensive surface water, decisions to address land subsidence have community impacts and economic consequences. In response to ongoing conversations on water management in Montgomery County, a consortium of special-use districts commissioned the Houston Advanced Research Center (an effort facilitated by Stephanie Glenn) to assemble a groundwater Science Advisory Committee (the remaining authors) to review and assess research findings describing groundwater resources and subsidence in Montgomery and Harris counties. At the request of area stakeholders, the Committee reviewed a technical report commissioned by the Lone Star Groundwater Conservation District that assessed past and current investigations of land subsidence in the Jasper Aquifer. The Committee reviewed the technical report and related studies and found a correlation between groundwater pumping and observed land subsidence in the county, including a decrease in subsidence when supply switched from groundwater to surface water in The Woodlands area since 2015. The district's consultant used the Houston Area Groundwater Model to show that the effect of a unit water-level decline on land subsidence was 1000 and 100 times greater in the Chicot and Evangeline aquifers, respectively, than the Jasper Aquifer. However, compressibility values in the model for the Jasper Aquifer are too conservative, considering that the Jasper is geologically similar to the Chicot and Evangeline aquifers over which land subsidence is well documented.

Mace, R. E., S. Glenn, J. Ellis, G. R. Miller, W. Oliver, W. J. Seifert, J. M. Sharp, Jr., J. Tracy, and G. Wang, 2021, Observed and potential land subsidence in the Gulf Coast Aquifer of Montgomery County, Texas: *GeoGulf Transactions*, v. 71, p. 455.

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## NOTES

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