

NEWS RELEASE 1-JUL-2026

New database for subsurface energy storage could be boon for natural gas industry

Peer-Reviewed Publication

UNIVERSITY OF TEXAS AT AUSTIN

Researchers at The University of Texas at Austin have produced a new analysis of underground natural gas storage sites around the country. The analysis can help guide future expansion of natural gas storage capacity, optimize existing storage facilities, and aid in developing the emerging hydrogen and carbon storage industries.

The study “Geoscience-Informed Evaluation of U.S. Natural Gas Storage Reservoirs, Aquifers, and Salt Caverns” was published in the journal *Earth Energy Science*. It is the first to combine geological assessments, reservoir engineering and operational data from the nationwide network of underground storage systems that serves the nation’s energy needs.

Abouzar Mirzaei Paiaman, a research assistant professor at the Bureau of Economic Geology at the UT Jackson School of Geosciences, said the information is a key tool for companies looking to expand the natural gas storage systems, which is expected to be necessary in the coming years as demand and production increase.

“This database and the insights derived from it can be used to screen and identify the most suitable candidates for gas storage,” he said. “We have ranked facilities using a range of performance metrics, creating a valuable resource that helps pinpoint the most promising locations for expanding existing storage operations or developing new gas storage projects.”

The U.S. has the largest underground natural gas storage and pipeline system in the world, consisting of nearly 400 underground storage facilities in depleted oil and gas reservoirs, saline aquifers, and engineered solution-mined salt caverns. Collectively, they have a storage capacity of approximately 9.2 trillion cubic feet. For comparison, the U.S. uses about 92 billion cubic feet of natural gas a day.

Because the U.S. uses natural gas in such large quantities, underground storage in huge geological structures is the only way to ensure there is a readily available supply.

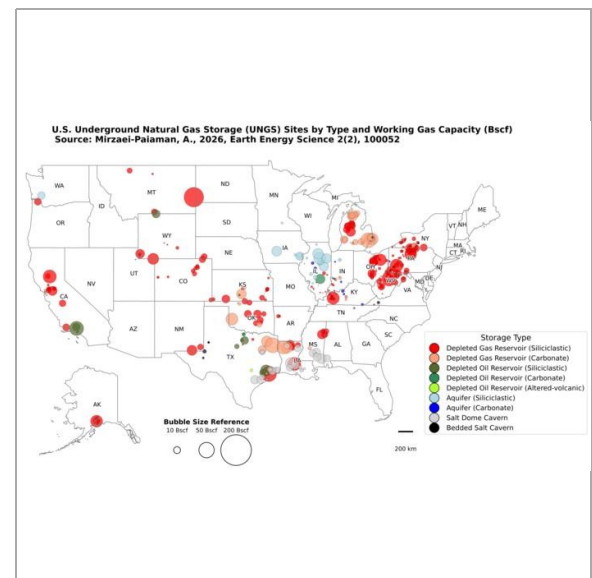


IMAGE:

UNDERGROUND GAS STORAGE SITES IN THE UNITED STATES.[view more >](#)

CREDIT: UT-AUSTIN BUREAU OF ECONOMIC GEOLOGY

The new study builds upon and significantly expands two existing databases: one maintained by the U.S. Energy Information Administration and the other by the U.S. Pipeline and Hazardous Materials Safety Administration. While these databases provide basic facility-level information, Mirzaei Paiaman and his team took the analysis a step further by compiling detailed geological, subsurface, and operational data for underground gas storage facilities across the United States. The new integrated database provides a far more comprehensive and valuable resource for gas storage engineering and enables analyses that were previously not possible using the publicly available datasets alone, researchers said.

"Underground geological storage in depleted fields, saline aquifers, and engineered salt caverns are the only viable options that provide the storage capacity for a system that stretches across the country supplying natural gas to industry, and commercial and residential users," said Mark Shuster, the deputy director of the bureau's energy division. "This study provides insights on the geological, engineering, and operational attributes of the different storage types to provide a straightforward framework to inform developing new underground storage or repurposing existing storage."

Beyond natural gas, the researchers said that the new database can be readily used for companies interested in underground storage of other energy sources as well as greenhouse gases. That includes hydrogen, a carbon-free fuel source, or CO₂, which could be kept out of the atmosphere by being stored permanently underground.

The study was supported by the State of Texas Advanced Resource Recovery program, a research program at the bureau focused on maximizing the responsible production and profitability of earth resources in Texas.

Related ongoing research includes studying the integration of hydrogen storage with natural gas storage, developing strategies for improving the performance and use of existing storage facilities, and evaluating the use of alternative gases as "cushion gas" in existing and future natural storage facilities. About half the country's stored natural gas is considered "cushion gas," which is gas that is permanently stored to provide sufficient pressure in the underground reservoir so the other half can be readily accessed when needed. Replacing it with CO₂, for instance, could free up more natural gas for beneficial use, while providing a way to trap CO₂ underground.

For more information, contact: Anton Caputo, Jackson School of Geosciences, 210-602-2085; Monica Kortsha, Jackson School of Geosciences, 512-471-2241; or Julia Sames, 210-415-9556.

JOURNAL

Earth Energy Science

DOI

10.1016/j.ees.2026.100052 [↗](#)

METHOD OF RESEARCH

Data/statistical analysis

SUBJECT OF RESEARCH

Not applicable

ARTICLE TITLE

Geoscience-informed evaluation of U.S. natural gas storage reservoirs, aquifers and salt caverns

ARTICLE PUBLICATION DATE

1-Jun-2026

COI STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Disclaimer: AAAS and EurekAlert! are not responsible for the accuracy of news releases posted to EurekAlert! by contributing institutions or for the use of any information through the EurekAlert system.

Media Contact

Anton Caputo
University of Texas at Austin
anton.caputo@jsg.utexas.edu
Cell: 210-602-2085
