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## High-Resolution Computed Tomography Dataset of Mount Simon Sandstone

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Geological carbon storage is an essential part of climate change mitigation. The Illinois Basin has become an early focal point of geological carbon storage (GCS) research and its implementation in the United States. The principal storage target in the basin is the Mount Simon Sandstone. Known for its exceptional thickness, depth, porosity, and sealing properties of overlying formations, this saline reservoir is crucial for long-term CO<sub>2</sub> sequestration efforts.

In support of these efforts, we present an extensive Computed Tomography (CT) dataset on a high porosity and permeability zone in the lower Mount Simon Sandstone available on the Energy Data eXchange® (EDX). This publicly accessible database comprises over 500 GB of high-resolution CT scans of six core samples, with resolutions ranging from 14.8  $\mu\text{m}$  to 0.7  $\mu\text{m}$  per pixel. The scans include both dry sandstone samples and those saturated with brine and supercritical CO<sub>2</sub>, allowing for comparative analyses across different conditions and resolutions. Coarser scans provide an overview of the sandstone's bedding structure, whereas finer resolution scans reveal intricate details of pore infill and pore throat features. Metadata on location, depth, and saturation state enhance usability, enabling quick identification and cross-sample comparisons.

This dataset represents over a decade of non-destructive geological characterization work, consolidating results from various projects into a single, accessible resource. This data repository can inform permeability models and refine predictions for reservoir performance. Dissemination of this information to the wider scientific and GCS community will support further model development, testing, and stakeholder engagement. By providing a robust resource for research and collaboration, the database contributes to achieving net-zero greenhouse gas emissions by supporting continued progress in safe, reliable, and environmentally sustainable energy solutions.

### Country

United States

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### References

Gill, M., Pohl, M., Brown, S., Jarvis, K., Crandall, D. Mt. Simon Sandstone - High Resolution CT. Energy Data eXchange, 2024. <https://edx.netl.doe.gov/dataset/mt-simon-sandstone-high-resolution-ct>, DOI: 10.18141/2326948

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