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## Fast assessment of CO<sub>2</sub> plume extent using a connectivity-based surrogate model

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In a geological carbon storage (GCS) project, it is critical to predict the extent of injected CO<sub>2</sub>. However, it is not practical to quantify the uncertainty in the CO<sub>2</sub> plume extent by conducting full physics flow simulations for hundreds of geological models representing high geological uncertainty. In this study, a computationally efficient surrogate model is introduced to quickly approximate CO<sub>2</sub> plume migrations in a 3-dimensional heterogeneous reservoir during an injection period. CO<sub>2</sub> plume migrations are approximated based on connectivities between a CO<sub>2</sub> injector and other locations, which are computed using rock and fluid properties. The connectivity-based surrogate model saves about 90% of the computational cost in quantifying the uncertainty in the extent of CO<sub>2</sub> plume compared to a full physics flow simulator.

### References

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**Primary author:** JEONG, Hoonyoung (University Of Texas At Austin)

**Co-author:** SUN, Alexander (Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin)

**Presenter:** JEONG, Hoonyoung (University Of Texas At Austin)

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