Uncertainty Analysis of CO_2 Sequestration in Deep Saline Aquifer

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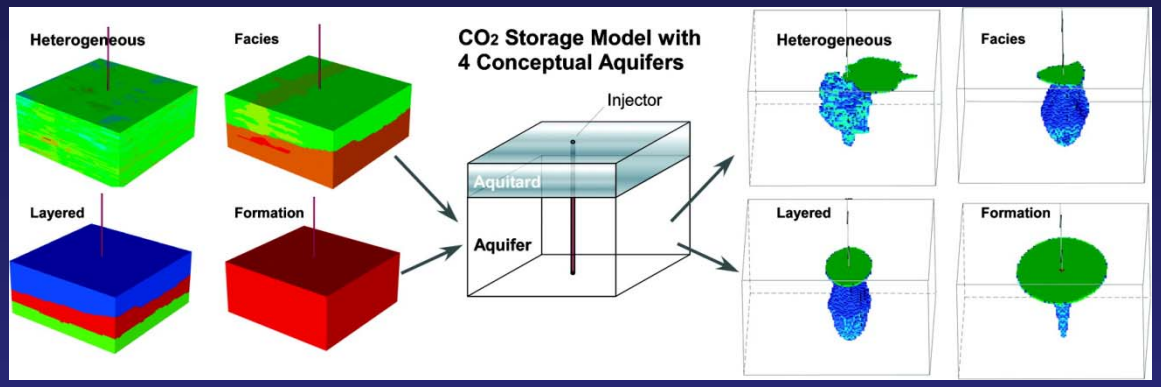
New Thinking



(1) First Study Phase:

Based on a synthetic aquifer, multiple conceptual models are created at different heterogeneity resolutions. We found that models with coarsened resolutions can indeed capture certain aspects of CO_2 flow dynamics, although the optimal resolution depends on the prediction goal and the strength of heterogeneity.

(1) Second Study Phase:

Mt. Simon Sandstone, Illinois Basin, is recognized as an important subsurface reservoir for CO_2 storage. To inject CO_2 into Mt. Simon at the commercial scale requires the construction of geologic site model and conducting reservoir simulation with this model, which will help to build confidence in site selection, storage estimation, and risk assessment. In this endeavor, realistic reservoir modeling is key to capturing important CO_2 flow and leakage pathways.

Based on Mt. Simon data collected at the basin scale, a geologic structure model is constructed, including 11 NW-SE orienting faults that intersect the sandstone formation. Data from wireline logs are also included in this model, along with geological cross sections and maps. Based on this model, future work will conduct uncertainty analysis in CO_2 storage, assessing the effect of different conceptual models.