

Regional CO₂ sequestration capacity assessment for the coastal and offshore Texas Miocene interval

GCCC Digital Publication Series #13-50

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Keywords:

Capacity; Regional study-Gulf Coast

Cited as:

Wallace, K.J., Meckel, T.A., Carr, D.L., Trevino, R.H., and Yang, C, 2013, Regional CO₂ sequestration capacity assessment for the coastal and offshore Texas Miocene interval: Greenhouse Gas Science and Technology, p. 1-13, doi: 10.1002/ghg. GCCC Digital Publication #13-50.

Abstract:

Estimating regional geologic storage capacity potential for carbon dioxide will play an important role in determining the feasibility of widespread carbon capture and storage (CCS) programs in the United States and worldwide. The sandstone reservoirs of the Miocene Age located off the Texas coast in the northern Gulf of Mexico are a promising target for CCS due to favorable geologic properties (high porosity/permeability, effective traps and seals, etc.) and proximity to high carbon dioxide emission sources. The common method for regional storage capacity estimation involves the calculation of a pore volume which is modified by some discount or efficiency factor. Though efficiency factors have a large effect on calculated capacity, little work has been done to validate the use and effectiveness of these terms. In this paper we aim to provide an estimate for the storage potential of the coastal and offshore Texas Miocene interval using a common calculation methodology and to begin expanding on this calculation by developing and incorporating an additional sand picking refinement step. This step allows for an initial investigation into the accuracy and utility of typical efficiency factors and regional storage calculations. We find that in our study area, capacity that is calculated using the actual net sand thickness, or 'net capacity', is ~25% less than capacity that is calculated using the total interval thickness, or 'gross capacity', though, ideally, the two should be equal. Discrepancies between the two calculations emphasize the large uncertainty inherent in efficiency factors and highlight the need for further investigation.

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