Quick-look assessments to identify optimal CO_2 EOR storage sites

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Abstract:
A newly developed, multistage quick-look methodology allows for the efficient screening of an unmanageably large number of reservoirs to generate a workable set of sites that closely match the requirements for optimal CO_2 enhanced oil recovery (EOR) storage. The objective of the study is to quickly identify miscible CO_2 EOR candidates in areas that contain thousands of reservoirs and to estimate additional oil recovery and sequestration capacities of selected top options through dimensionless modeling and reservoir characterization. Quick-look assessments indicate that the CO_2 EOR resource potential along the US Gulf Coast is 4.7 billion barrels, and CO_2 sequestration capacity is 2.6 billion metric tons. In the first stage, oil reservoirs are screened and ranked in terms of technical and practical feasibility for miscible CO_2 EOR. The second stage provides quick estimates of CO_2 EOR potential and sequestration capacities. In the third stage, a dimensionless group model is applied to a selected set of sites to improve the estimates of oil recovery and storage potential using appropriate inputs for rock and fluid properties, disregarding reservoir architecture and sweep design. The fourth stage validates and refines the results by simulating flow in a model that describes the internal architecture and fluid distribution in the reservoir. The stated approach both saves time and allows more resources to be applied to the best candidate sites.

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