CO_2 Storage Potential in Louisiana

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Abstract

What does CO_2 sequestration potential look like in Southern Louisiana from emitters to transportation and storage? This study considers all pieces along the value chain to identify the most prospective areas.

The first step was looking at clusters of low-cost emitters with costs calculated from an aggregate of active projects and engineering cost estimates for various technologies worldwide. Understanding the location of the lowest-cost capture hubs allowed us to pair them with nearby storage sites. A geological model of the tertiary sands was created, and reservoir storage volumes, injectivity, storage costs, and plume migration areas were calculated using the FENETL CO_2 Saline Storage Cost Model. Finally, a risk map was created looking at existing wellbore penetrations, faults, previous earthquakes, caprock, freshwater aquifers, and salt domes to determine where there may be a higher chance of expensive wellbore remediation, fault reactivation or CO_2/brine escape and freshwater contamination.

Large clusters of sub $50/tonne capture cost emitters representing over 25 million tonnes of CO_2/year can be found along the Mississippi River. Most emissions can be connected via an existing CO_2 pipeline in the region or to natural gas pipelines that could be retrofitted or leveraged for new pipelines along their rights-of-way. CO_2 storage potential in the area is great, with emitters sitting directly on top of 4.3 to 9.2 Mt CO_2/section, single well, single reservoir injection rates of 0.7 to 2.7 Mt/well/yr, and storage costs ranging from 2.1 to 4.3 $USD/tonne. Finally, the degree of risk escalates to the north as the number of freshwater aquifers and legacy wellbore penetrations increase, raising the chance of contamination and expenses related to wellbore remediation.