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Offshore CO_2 Storage Potential of the Mafla Continental Shelf, Eastern Gulf of Mexico

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Abstract Text:
An estimated 40% of U.S. anthropogenic CO_2 emissions is generated in the southeast, and a large proportion of these emissions is generated within 100 km of the coastline. Offshore storage of anthropogenic CO_2may be an attractive solution to reduce emissions because of high capacity and uniform governmental ownership. This research focuses on determining the capacity and feasibility of storage in the outer continental shelf offshore of Mississippi, Alabama, and Florida (a.k.a., the MAFLA shelf).

Abundant data exist in the public domain that facilitate the assessment of offshore storage opportunities. More than 1,000 seismic reflection profiles are available in the region and provide exceptional imaging of the subsurface geologic architecture. Geophysical well logs are available from more than 1,100 wells. Velocity surveys are available from 71 of these wells and facilitate interpretation of seismic data in the depth domain. Reservoir pressure and geothermal data indicate that storage potential is greatest between depths 1 and 4 km.

Preliminary assessment indicates that the most attractive storage options in the region are in Cretaceous and Miocene sandstone units in the DeSoto Canyon Salt Basin offshore of Mississippi, Alabama, and the Florida Panhandle. In this area, mudstone and chalk formations constitute the principal confining units. Salt structures are diverse and include pillows, rollers, and diapirs. The West Florida Shelf contains an extensive Cretaceous carbonate platform, where porosity is developed principally in dolomite zones that underlie anhydrite seals. Ongoing work focuses on subsurface mapping and quantification of reservoir pore volume and CO_2 storage capacity.

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