Abstract

Carbon capture and storage (CCS) in the subsurface is rapidly becoming a viable option for reducing carbon emissions. U.S. DOE’s current CCS assessment efforts have been focused onshore using a volumetric approach. However, due to the vast resource potential in deep saline formations offshore, CCS is the environment it is gaining more attention. Upon extensive literature review, we have identified significant differences between offshore and onshore systems that must be addressed in a resource assessment methodology. These differences include geomechanics of unconsolidated marine sediments, chemistry and flow of subsurface waters, and logistics and economics of offshore operations. Our literature review also reveals unconventional mapping opportunities offshore, such as basin trapping, gravitational trapping, and hydrate storage. Accounting for these differences using a ranking system and prospectivity analysis will provide stakeholders and investigators with a methodology to accurately assess offshore carbon storage resources. Specifically, NETL’s geospatial and geostatistical tools tailored to offshore carbon storage estimation are powerful options for addressing these offshore considerations. Further, offshore data assimilation from a variety of sources performed at NETL can also aid in developing offshore-specific efficiency factors that help refine resource estimates in data-poor regions.

Project Goal: Year 1

Develop an offshore CO2 storage assessment methodology leveraging DOE: NETL’s existing volumetric onshore approach while addressing key differences in offshore deep saline formations.

Approach

• Complete extensive literature analysis and synthesis to describe offshore environments and identify key factors affecting CO2 storage resources there.
• Leverage DOE: NETL-developed volumetric approach and efficiency factors to calculate high-level site screening estimates (Goodman et al., 2013).
• Refine high-level estimates and reduce uncertainty in data-poor regions by incorporating geospatial analysis addressing key factors not included in the volumetric approach (Next Steps).


Next Steps

• Demonstrate how a ranking system/prospectivity analysis using NETL’s geospatial tools and offshore resources can be leveraged to develop an offshore resource assessment methodology and input into the offshore toolset.

For more information on NETL’s tools and offshore and CO2 storage efforts, please visit: https://edx.netl.doe.gov/tools/ https://edx.netl.doe.gov/offshore/ https://edx.netl.doe.gov/carbonstorage/