OCSS: OFFSHORE CO_2 SALINE STORAGE METHODOLOGY AND CALCULATOR

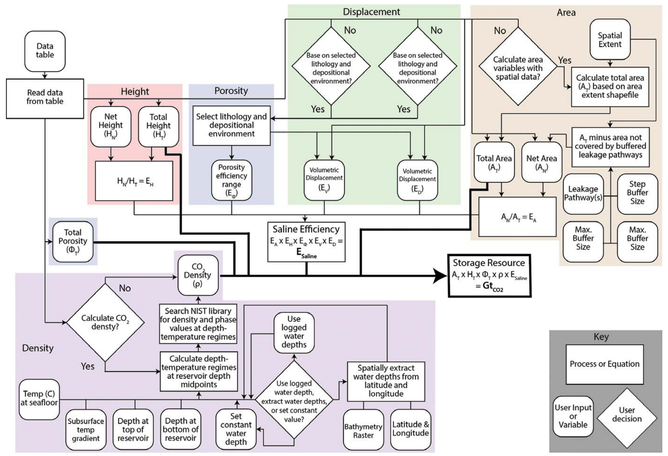
NETL researchers provide timely insights into offshore saline carbon storage potential assessment and risk reduction.

OFFSHORE SALINE RESERVOIRS: POTENTIAL CARBON STORAGE (CS) RESOURCE OPPORTUNITIES

The U.S. Department of Energy's (DOE) NETL published a **data-science-informed methodology and tool** for evaluating, characterizing, and quantifying CS potential in offshore saline reservoirs to **advance understanding** of offshore saline systems.

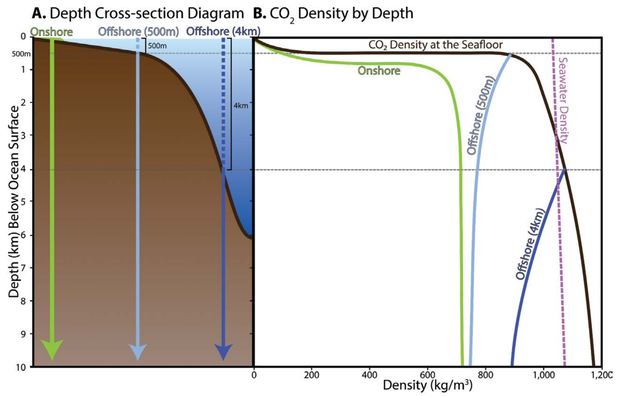
The methodology incorporates data, tools, and models from **NETL's R&D 100 award-winning Offshore Risk Modeling Suite** to support safe injection site selection strategies.

Remotely located below marine environments, saline reservoirs are potential resources that could serve as long-term, high-capacity storage for CO_2.



Framework of the Offshore CO_2 Saline Storage Calculator's logic. Background colors represent how different variables are handled (e.g., height, porosity). Figure from Romeo et al., 2022.

PUBLISHED THE SCIENCE-BASED METHODOLOGY IN THE HIGH IMPACT *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*.



(A.) Cross-section of onshore to offshore seafloor and injection points at depth below the ocean surface (0 m, 500 m, and 4 km).

(B.) Diagram showing CO_2 density values at the seafloor, injection points (as shown in diagram A), and the density of seawater. Diagram B shares a depth axis with the cross-section in diagram A.

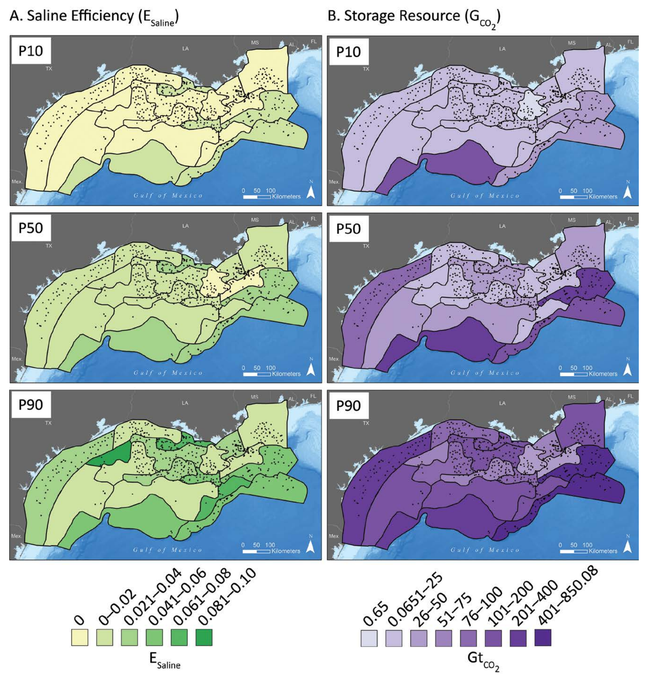
This big data-science-informed methodology and tool support DOE's carbon-negative goals and aligns with regulatory and commercial decision support requirements to responsibly unlock the potential of offshore CS.

This improves resource estimates, mitigates risks, and assesses reservoir and infrastructure reuse potential.

The adapted DOE-NETL methodology coincides with ongoing rule making by the U.S. Department of Interior charged with establishing the first set of regulations and rules for offshore CS in federal waters under the 2021 Bipartisan Infrastructure Law.

PROSPECTIVE STORAGE RESOURCE ESTIMATES FOR AREAS THROUGHOUT THE GULF OF MEXICO

Filling the niche prior to site-specific, temporally dynamic analytics, the OCSS Calculator estimates prospective reservoir volumes for CS. Demonstrable applications of the OCCS Calculator, as featured in the paper, include estimates for 18 geologically distinct domains, which were spatially defined by NETL's Subsurface Trend Analysis™ (*Rose et al., 2020*). Applications relied on spatial data, information from literature, and two to 50 interpreted petrophysical well logs per domain, which defined variables including porosity, sealing shales, and thickness. Results showed CO_2 to be in the liquid or supercritical phase at reservoir depth, with storage estimates ranging from 0.5 to more than 10,000 gigatons of CO_2. The calculator and relevant data are available for download on EDX®.



Calculated 10th, 50th, and 90th percentiles of (A) saline efficiency (E_{Saline}) values and (B) gigatons of CO_2 by geologic domain.

KEY RESOURCES

CLICK HERE TO ACCESS THE OCSS CALCULATOR

CLICK HERE TO VIEW THE JOURNAL PUBLICATION

AWARD NUMBER
FWP-1022465

PROJECT BUDGET

EY22 FUNDING

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RELIABLE CARBON STORAGE AND TRANSPORT

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