



**BOEM** Bureau of  
Ocean Energy Management

# 2022 GOM Sand Management Working Group meeting

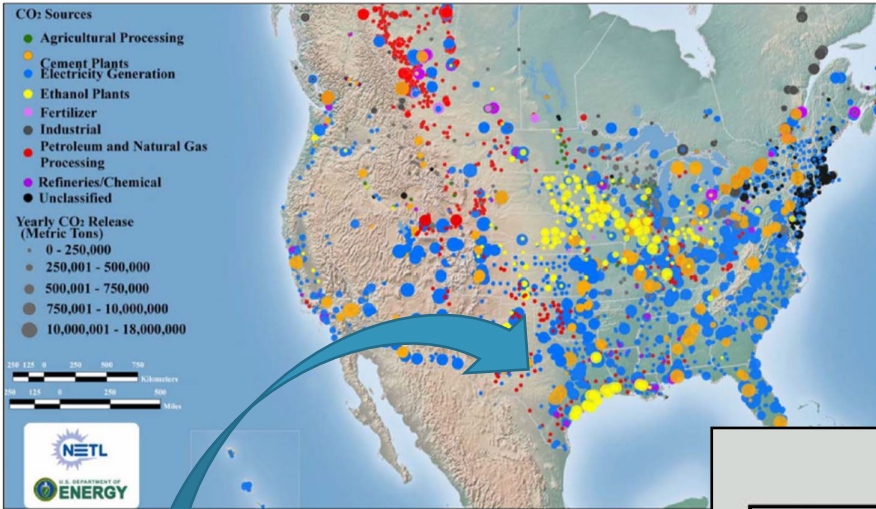
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December 8, 2022  
New Orleans, Louisiana

*Presented By:*

*Carlos Alonso | Resource Evaluation / Resource Studies Section Chief  
December, 2022*

# Carbon Sequestration Overview



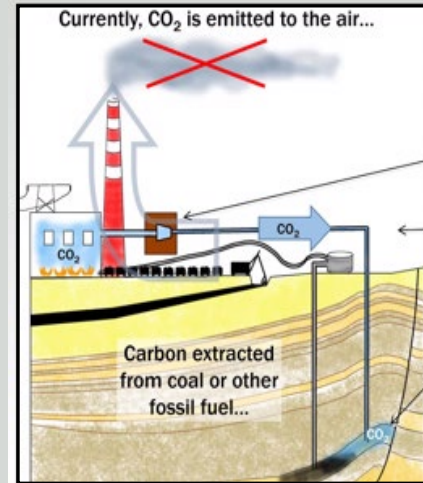
Source: NATCARB Atlas

## WHY?

Numerous CO<sub>2</sub> emission point sources along the Gulf Coast

## WHAT?

Capture, Transport and Storage



**Purpose:** To reduce CO<sub>2</sub> emissions to air from large point sources, e.g., power plants.

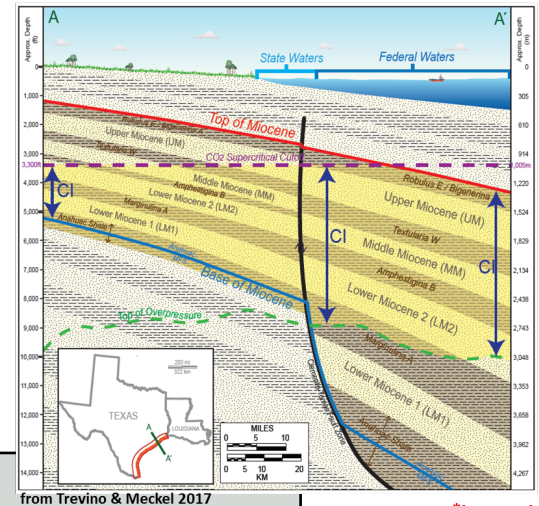
CO<sub>2</sub> is **captured** at point source, concentrated into high pressure, "supercritical" fluid...

CO<sub>2</sub> is **transported** via pipeline, then **injected** into the deep subsurface where...

CO<sub>2</sub> is **stored**, typically in pore space, for a geologically significant time.

David Carr  
UT-Austin, Bureau Economic Geology

## Strata Between Supercritical\* Depth and top of Overpressure



from Trevino & Meckel 2017

Supercritical\* Depth  
~3000'

Top of Overpressure  
~10,000' but variable

\*temperature & Pressure above which distinct liquid & gas phases do not exist

## WHERE?

Within subsurface geologic formations with excellent storage reservoir properties

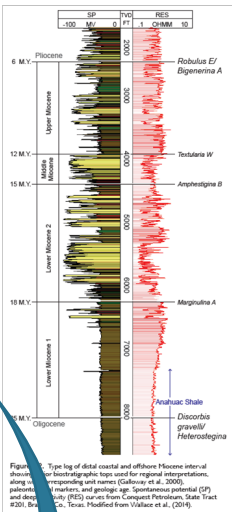
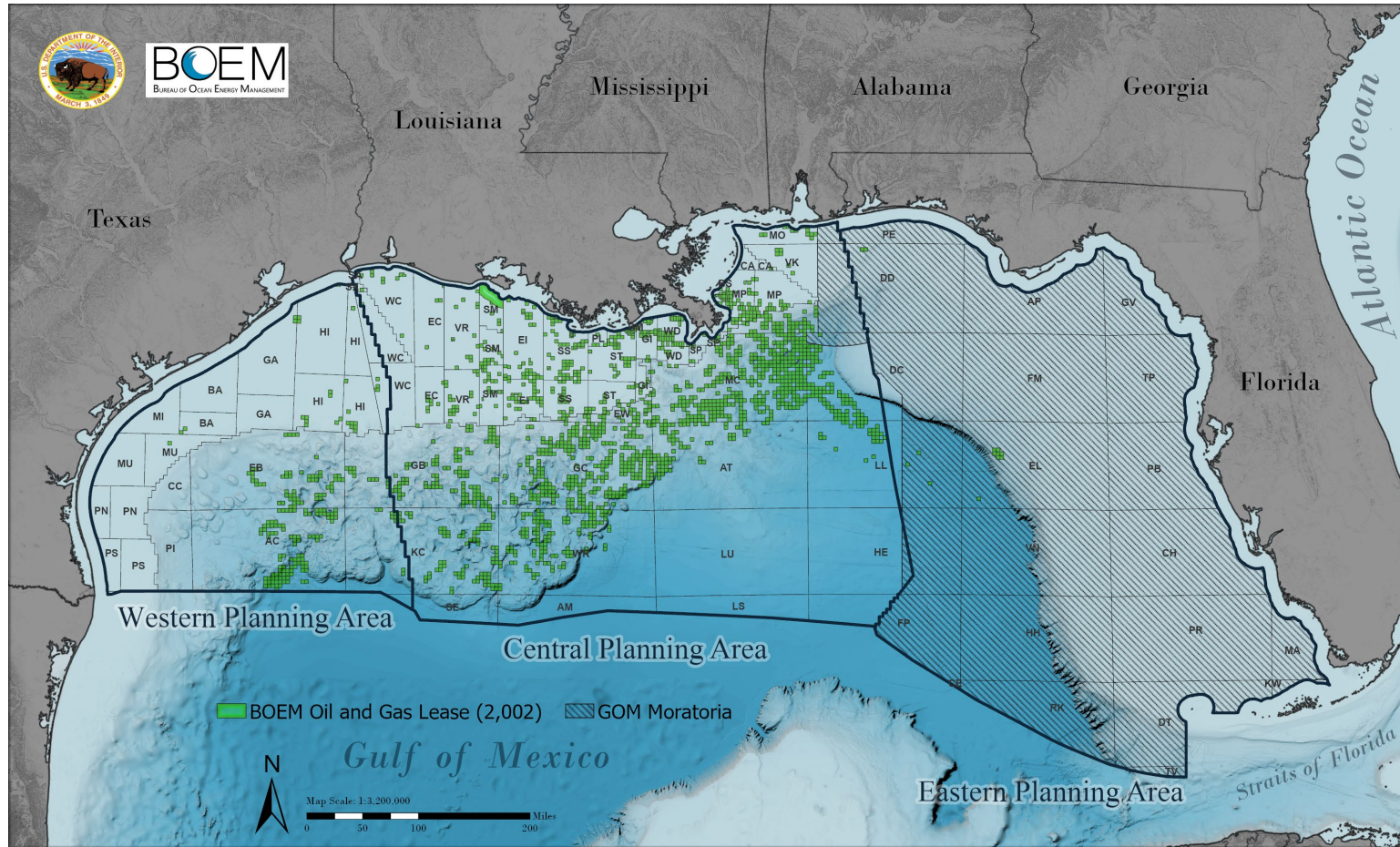


Figure 2. Type log of distal coastal and offshore Miocene interval showing stratigraphic tops used for regional interpretations, along with representative well names (Carrasco et al., 2005). Lithology markers, and geologic age, spontaneous potential (SP) and resistivity (RES) curves from Conquist Petroleum, State Tract #201, Brownsville, Texas. Modified from Wallace et al., (2014).





# Bipartisan Infrastructure Law, BIL



On November 15, 2021, Infrastructure Investment and Jobs Act, know as the Bipartisan Infrastructure Law (BIL) became law.

Section 40307 of the BIL amends Outer Continental Shelf Lands Act, OCSLA, to authorize the Secretary of the Interior to grant a **lease, easement, or right-of-way** on the outer Continental Shelf for activities that “provide for, support, or are directly related to **the injection of a carbon dioxide stream into sub-seabed geologic formations for the purpose of long-term carbon sequestration**”.



# Rulemaking Summary

- Joint Bureau of Ocean Energy Management (BOEM) – Bureau of Safety and Environmental Enforcement (BSEE) rulemaking is underway
- Rulemaking team established relying on existing expertise throughout the bureaus
- Extensive outreach underway



## Topics under consideration for the rulemaking include:

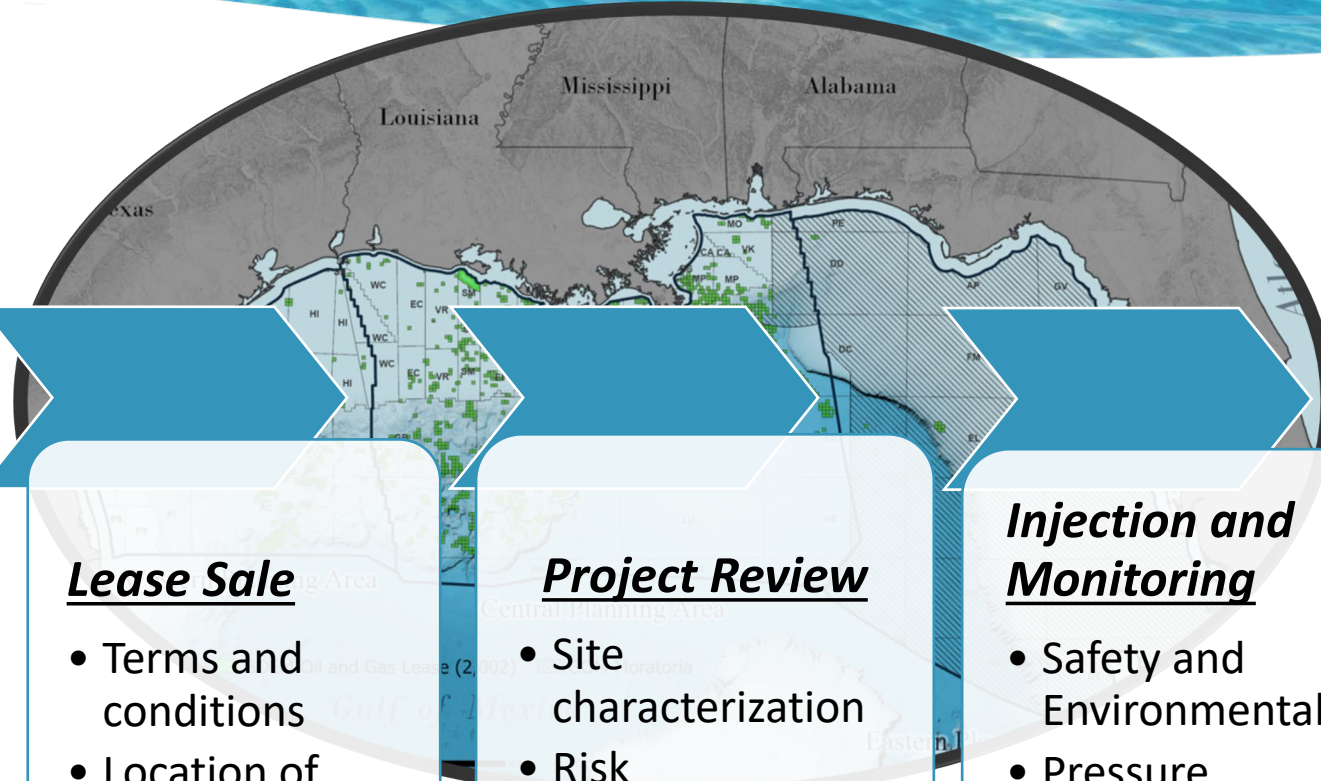


- Financial and economic considerations
- Environmental considerations
- Pre-lease exploration/site characterization
- Leasing
- Plans
- Liability
- Operations, facilities, and pipelines
- Well qualification and offset infrastructure
- Emergency response and mitigation
- Monitoring and reporting
- Decommissioning





# Considerations for Gulf of Mexico Carbon Storage



## PreSale / Site Selection

- Regional Scale Assessment
- Input from stakeholders
- Considerations with other activities
- NEPA Analysis

## Lease Sale

- Terms and conditions
- Location of offerings
- Size of offerings

## Project Review

- Site characterization
- Risk Management
- Plan / Permit submittal and revision
- Static/Dynamic Modeling

## Injection and Monitoring

- Safety and Environmental
- Pressure
- CO<sub>2</sub> Plume Migration

## Site Closure and Decommission

- Ensure containment and CO<sub>2</sub> plume stability



# GOM Saline Aquifer Characterization

Advantages

Large potential for storage capacity

Fewer legacy wells

Abundant geologic, geophysical, engineering and production data

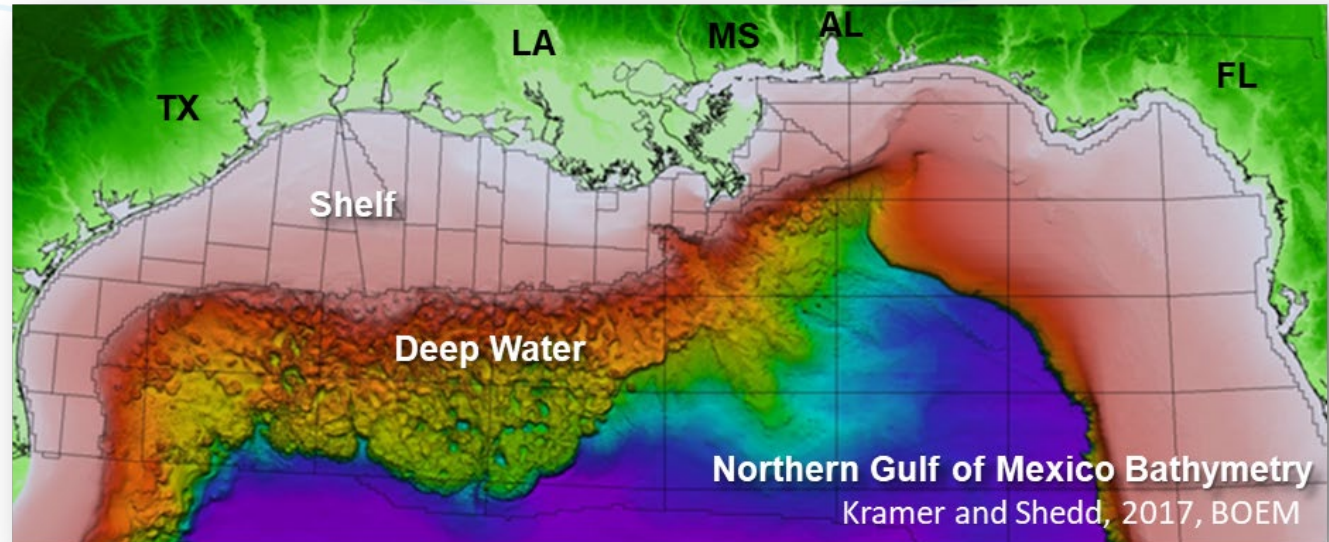
Multiple stacked reservoirs

Unknown seal integrity

Smaller available pressure margins

Monitoring challenges / economics

Risk and Considerations



- Saline Aquifers offer considerably larger CO2 storage potential relative to depleted reservoirs
- BOEM has identified and delineated nearly 300 saline aquifer basins from offshore Texas to offshore Louisiana
- Investigating suitability of individual Saline Aquifers
- Analysis will be utilized in considerations for Gulf of Mexico lease offerings





# GOM Depleted Reservoir Characterization

## Advantages

Potential for greater available pressure margins

Abundant geologic, geophysical, engineering, and production data

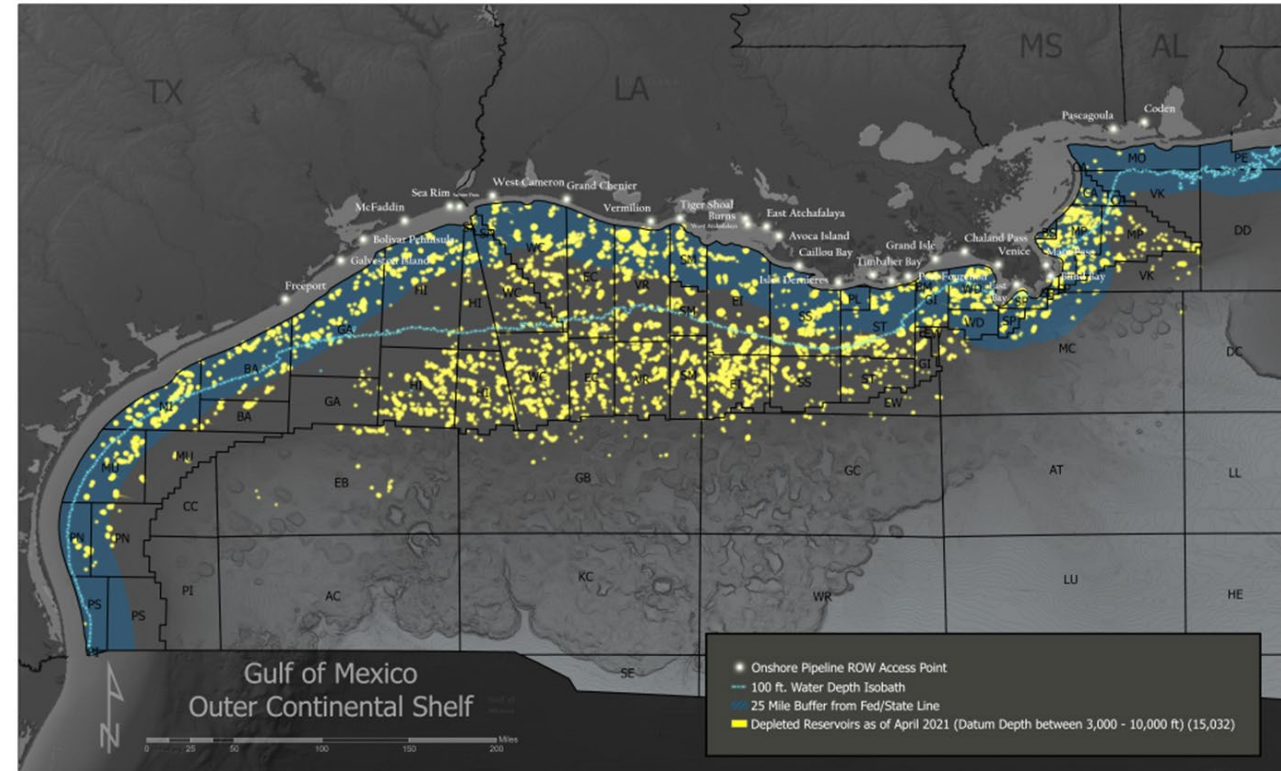
Proven trap and seal

Numerous legacy wells

Smaller storage capacity

Depleted reservoirs require an understanding of current reservoir temperatures and pressures

## Risk and Considerations

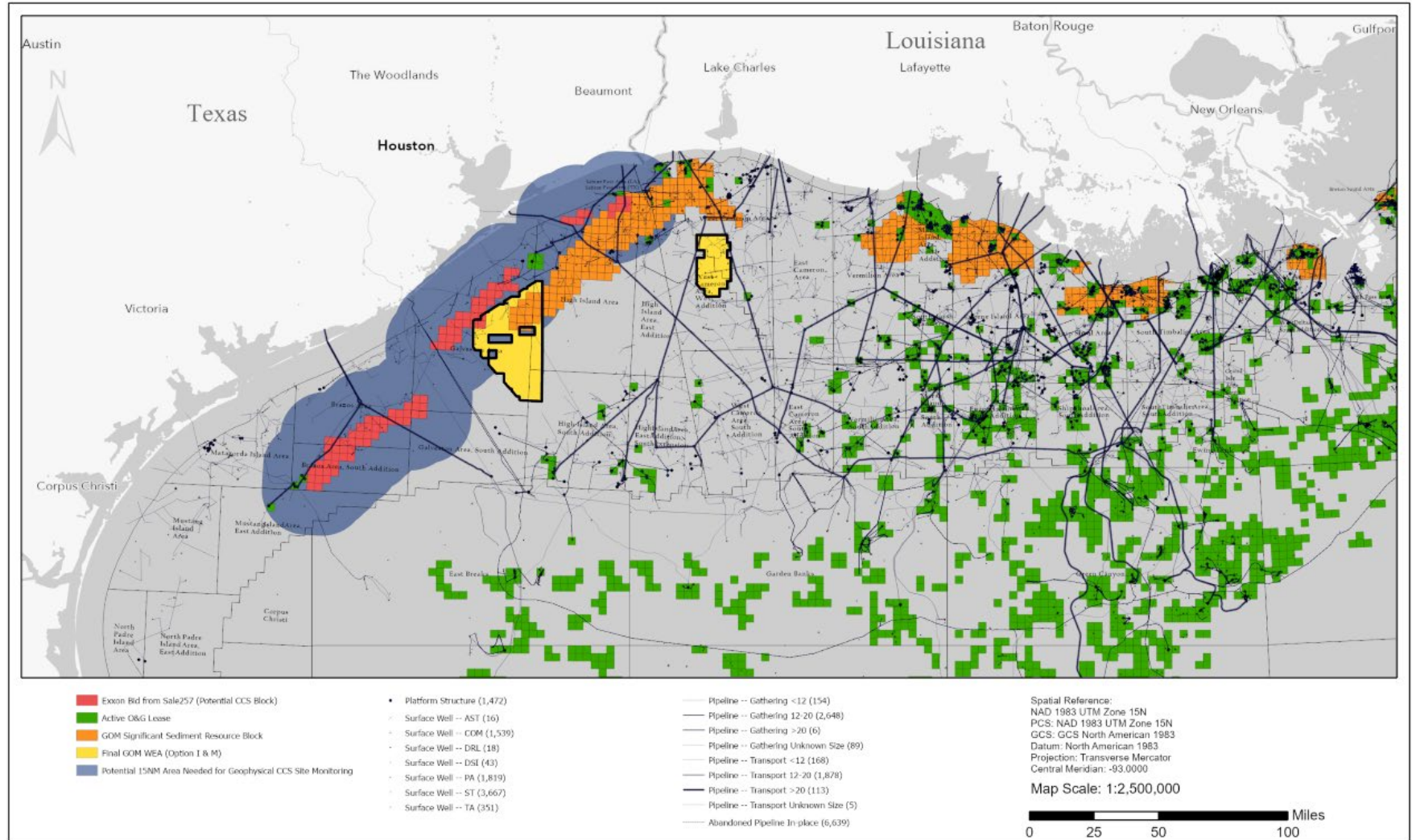


- Greater than 23,000 depleted reservoirs in the GOM.
- Greater than 15,000 in depth range of 3,000' – 10,000' sstvd.



# Gulf of Mexico Multi-Use Activity Considerations

- Multi use activities can coexist in the Gulf of Mexico with proper planning.





# GOM Sand Management Workshop Meeting CCS Conclusions

- The Gulf of Mexico and other United States OCS areas are poised to play a significant role in the nation's mission to reduce greenhouse gas emissions.
- The geology of the offshore Gulf of Mexico, among other offshore basins, is conducive to safely and permanently store large amounts of CO<sub>2</sub> in subsurface reservoirs, both saline aquifers and depleted oil and gas reservoirs.
- Both Depleted Reservoirs and Saline Aquifers are containers for offshore storage of CO<sub>2</sub> in the GOM; however, saline aquifers offer the potential for much greater storage capacities with less impact of legacy wells.
- Carbon Sequestration can coexist with other activities on the OCS including Sand Sediment Resources, Oil and Gas, Wind and other renewable energy with proper planning.



# Questions

# Thank you



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