

GoMCARB Update

Tip Meckel, Susan Hovorka, Ramon Trevino

GCCC Team

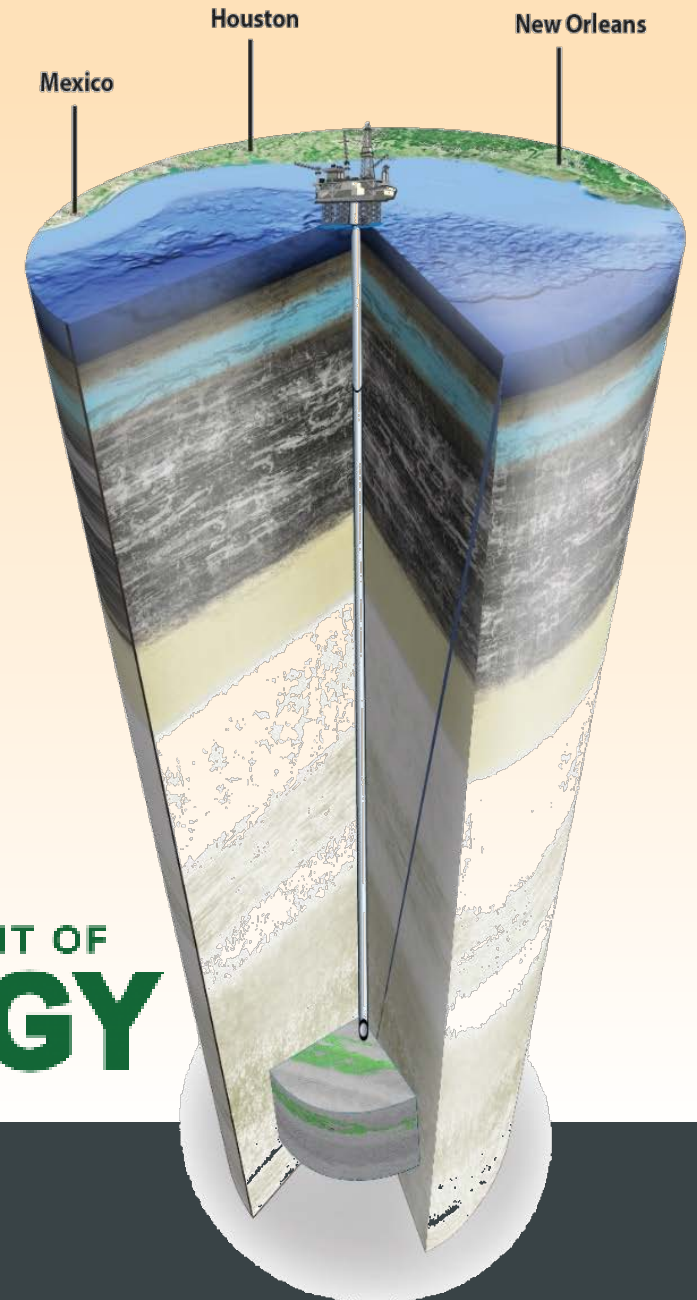
The University of Texas at Austin

Bureau of Economic Geology

Gulf Coast Carbon Center

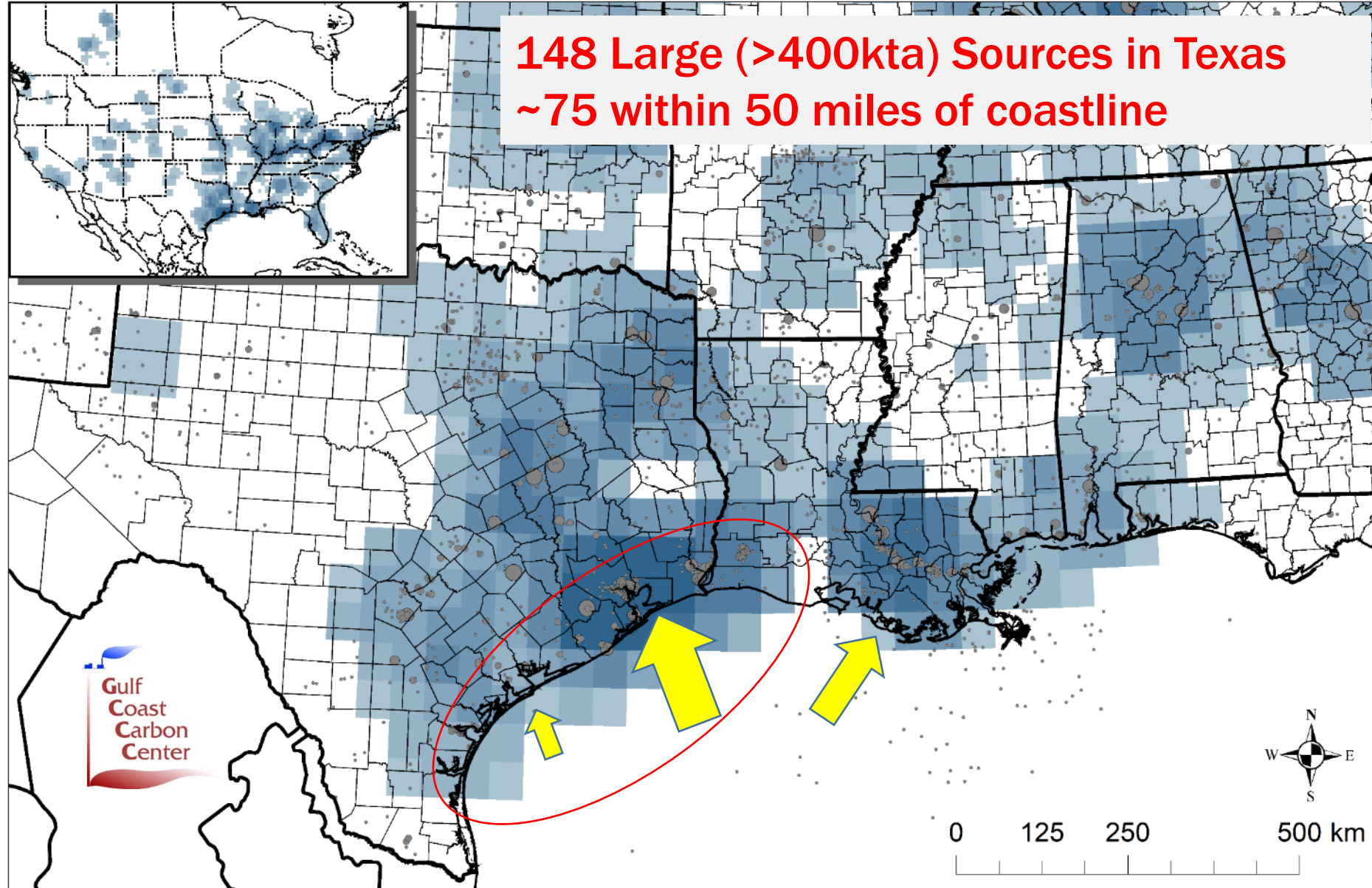


U.S. DEPARTMENT OF
ENERGY



BUREAU OF
ECONOMIC
GEOLOGY

Industrial CO₂ Emissions – ‘Center of Mass’ heat map



Offshore Studies

2000

2005

2010

2015

2020

Gulf of Mexico Partnership
for Offshore Carbon
Storage (GoMCarb)

UHR3D Seismic
for MVA-
Tomakomai

Texas Offshore Miocene

TXLA Offshore CO₂
Storage Assessment

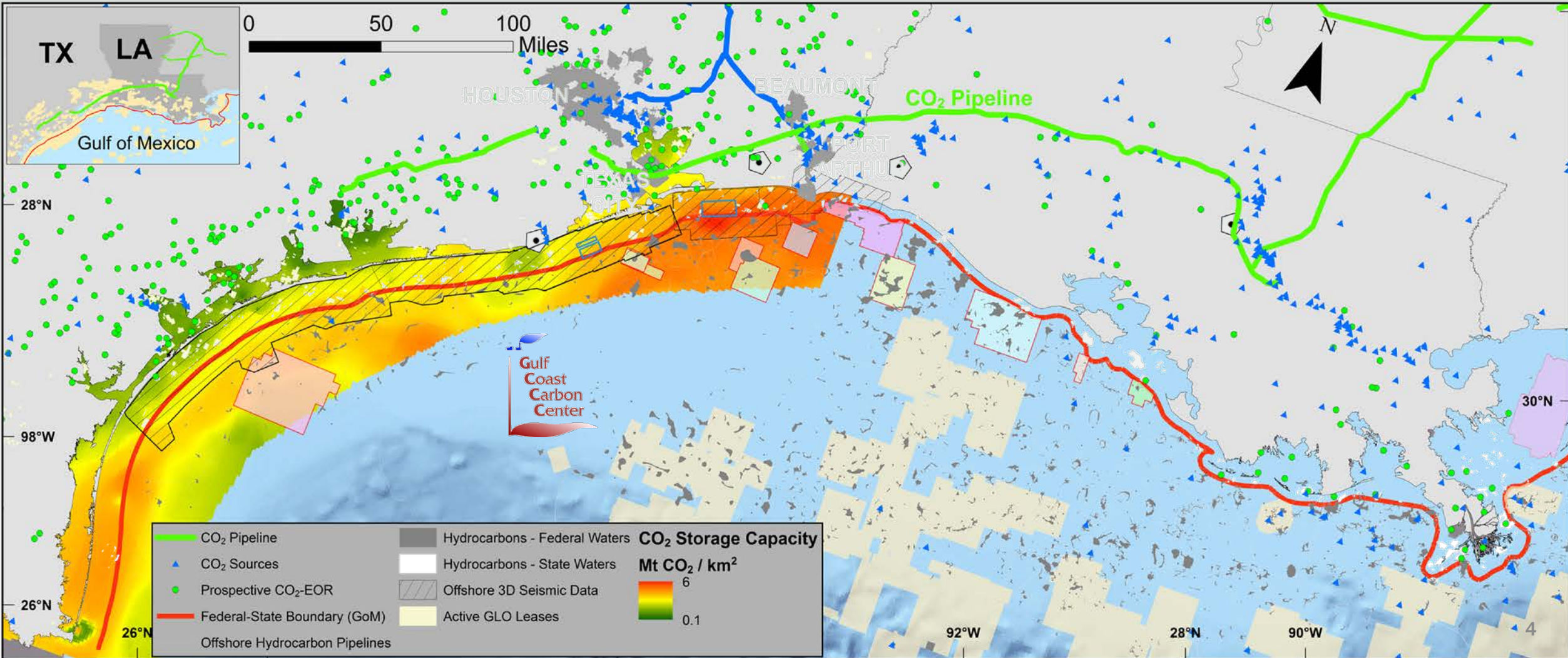
BOEM Sub-seabed GCS Best
Practices Manual

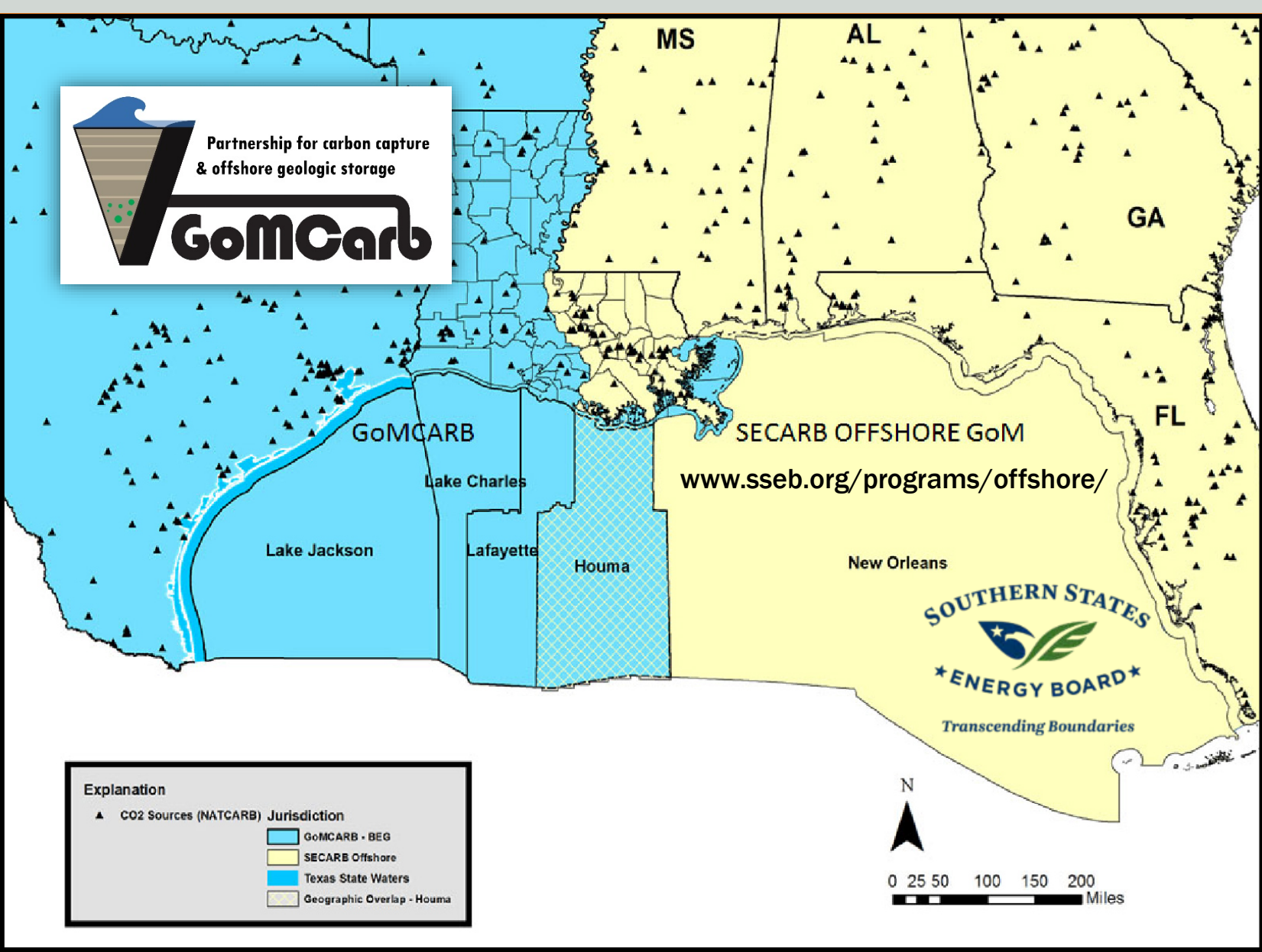
CarbonSAFE



Prospective Storage Resources: Static Regional Capacity

- NETL Methodology
- 40,000 sq. km.
- 3,300 logs
- Tops, net sand, porosity
- 172 Gt CO₂ storage total TX State Waters





Explanation

- ▲ CO2 Sources (NATCARB) Jurisdiction
- GoMCARB - BEG
- SECARB Offshore
- Texas State Waters
- Geographic Overlap - Houma

- [A\) Offshore Storage Resources](#)
- [B\) Risk Assessment, Simulation, Modeling](#)
- [C\) Monitoring, Verification, Assessment](#)
- [D\) Infrastructure, Operations, Permitting](#)
- [E\) Outreach](#)

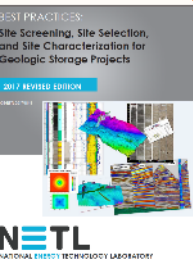
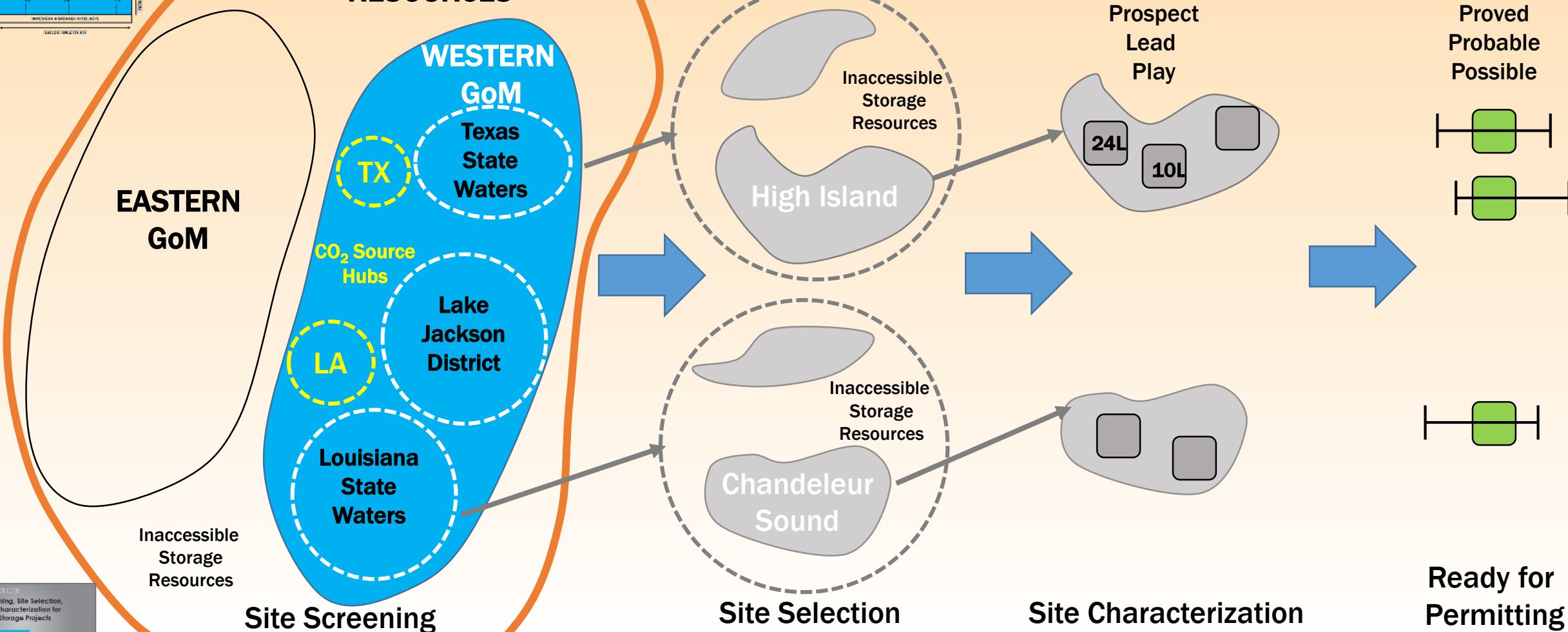
TYPICAL STORAGE RESOURCES	CAPACITY					
	1P	2P	3P	4P	5P	6P
ENHANCED OIL RECOVERY	10	20	30	40	50	60
CONTINGENT STORAGE RESOURCES	10	20	30	40	50	60
PROSPECTIVE STORAGE RESOURCES	10	20	30	40	50	60

Gulf of Mexico Basin

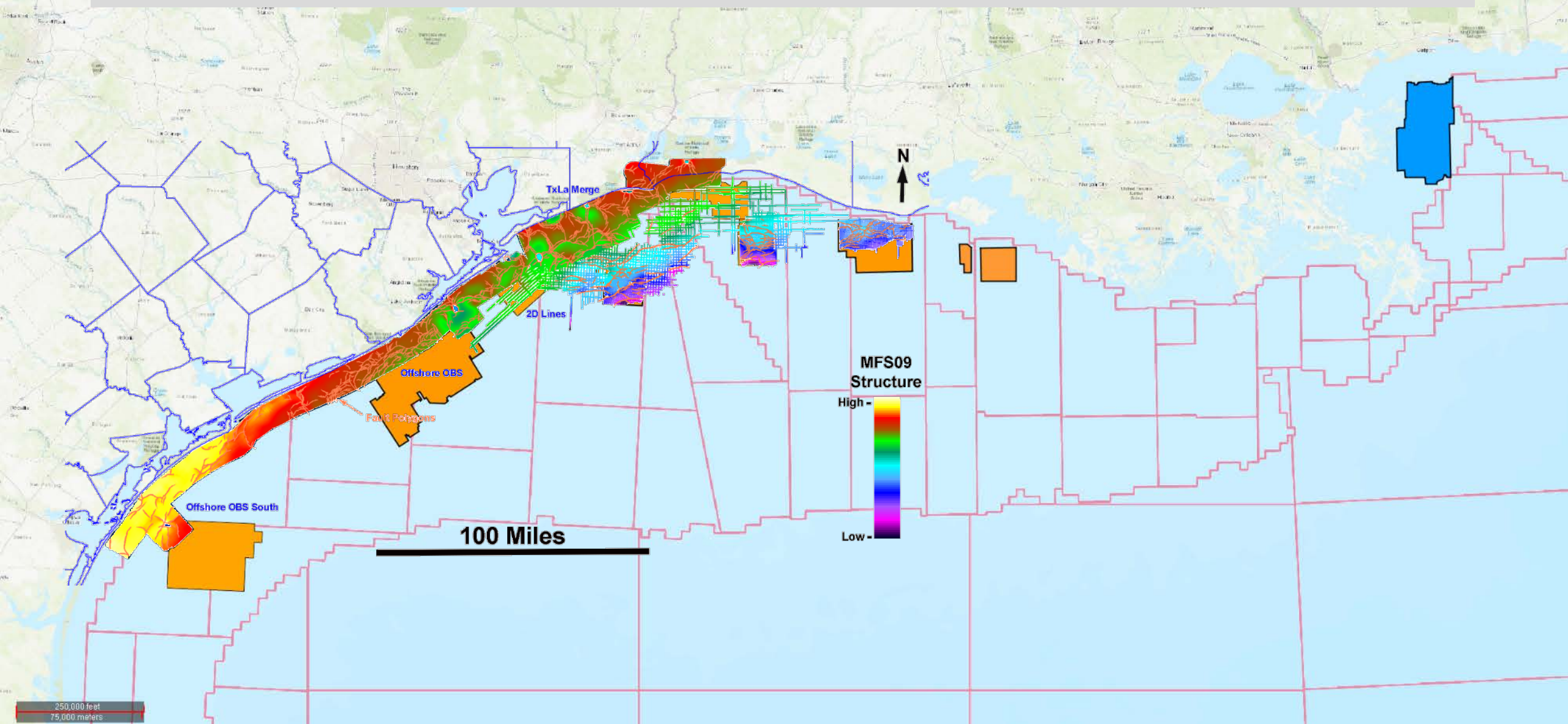
PROSPECTIVE STORAGE RESOURCES

CONTINGENT STORAGE RESOURCES

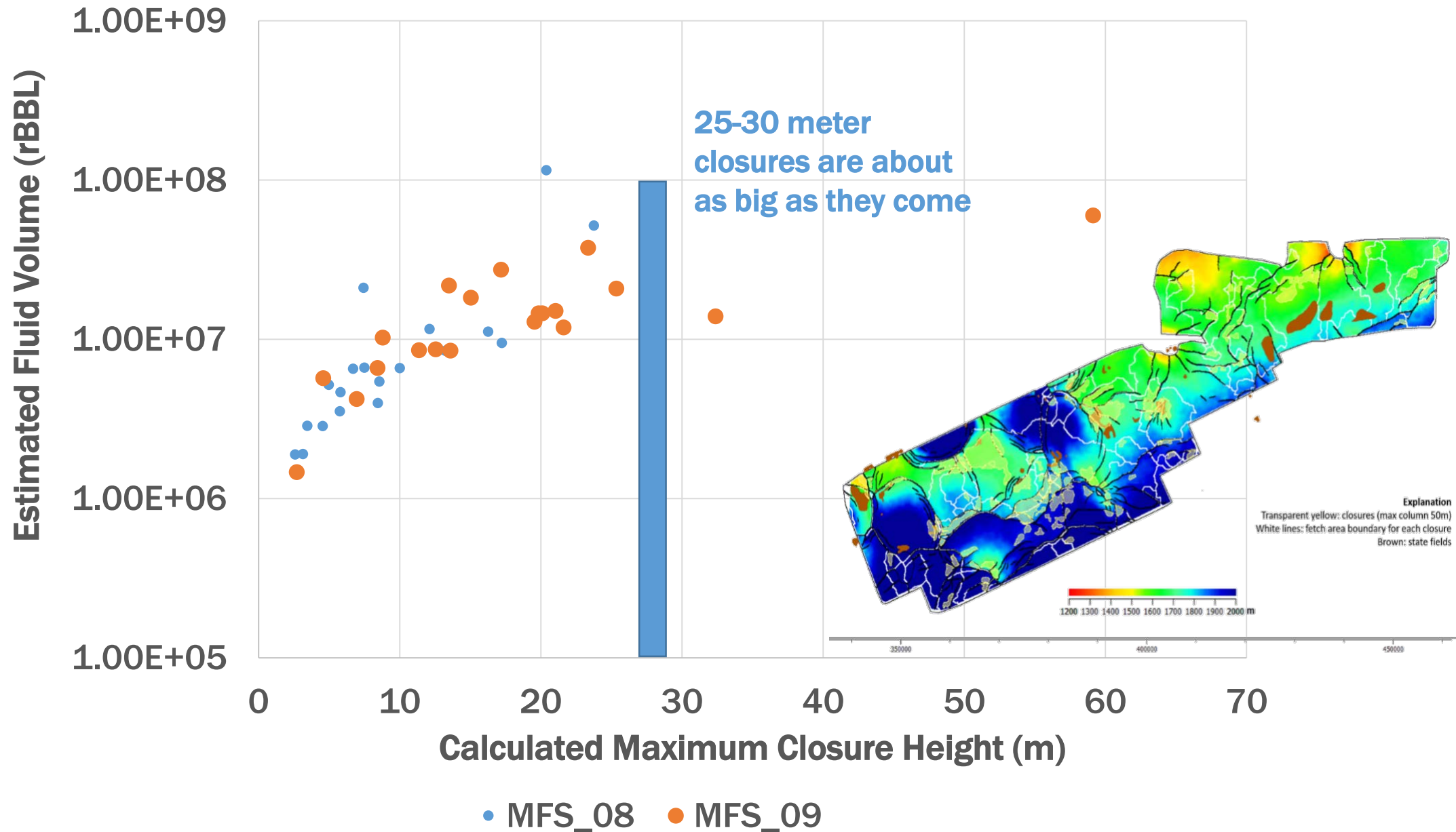
CAPACITY



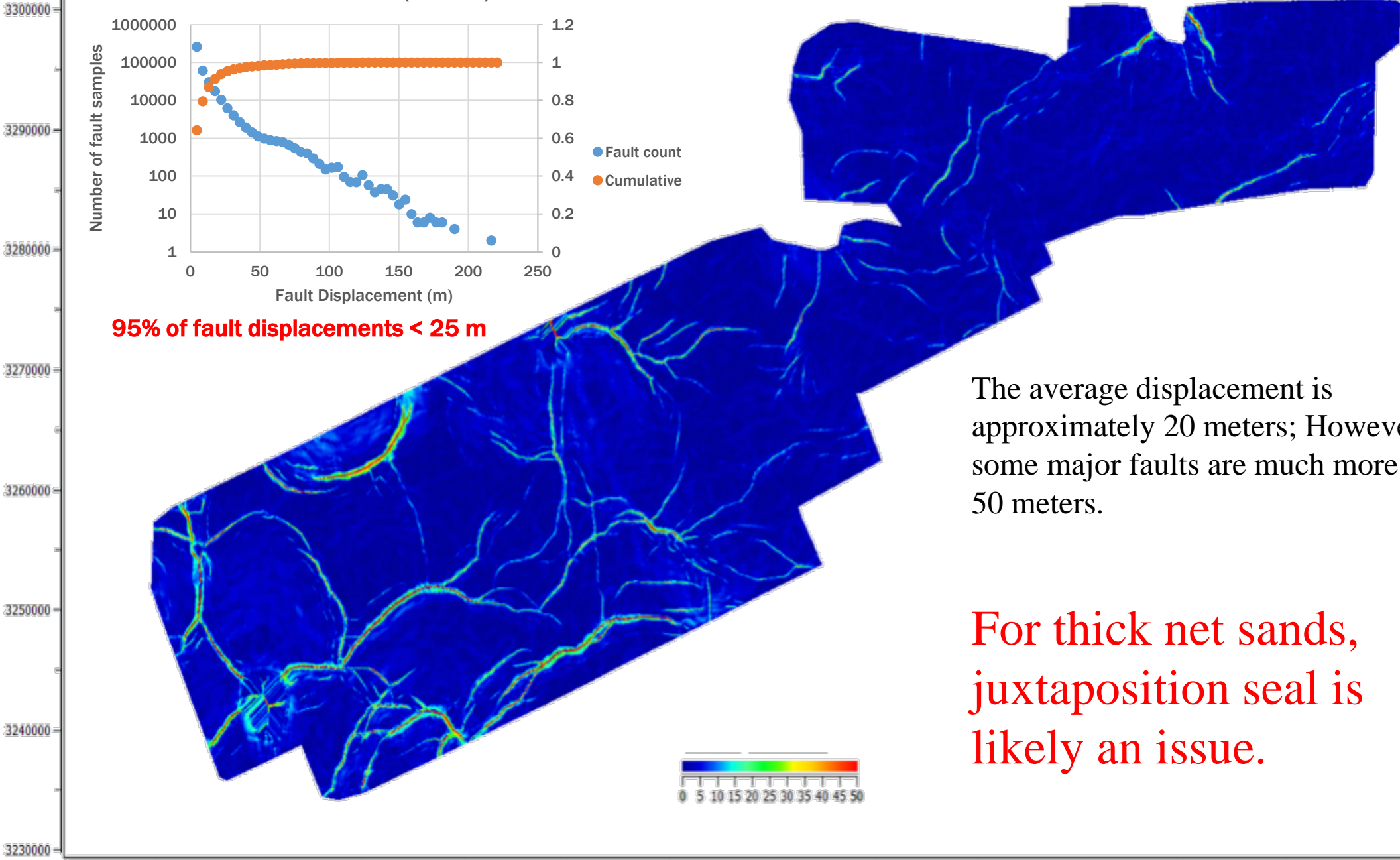
Seismic datasets available for assessing offshore CO₂ topics



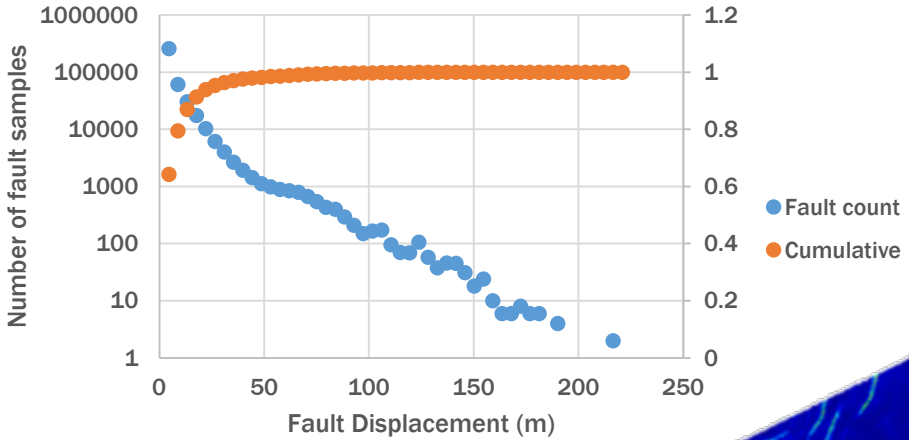
Structure Map Analysis – What is out there to find?



Faults maximum vertical displacement map



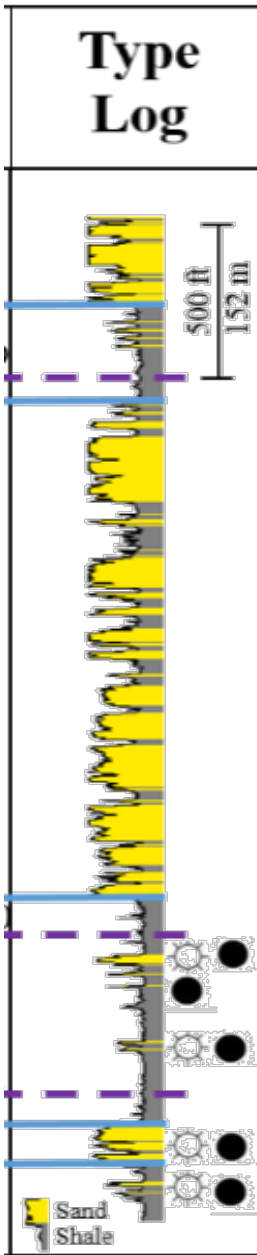
Fault Offset (meters)



95% of fault displacements < 25 m

The average displacement is approximately 20 meters; However, some major faults are much more than 50 meters.

For thick net sands, juxtaposition seal is likely an issue.



3 East Texas GoM CO₂ Hubs: La Porte, Texas City, Port Arthur



Conceptualization of CO₂ Storage Hub network in southeast Texas including EOR & storage

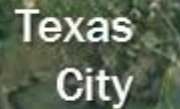
La Porte Hub
~5 Mta total
SMR total = 1.75 Mta



Port Arthur Hub
~20 Mta total
17 Mta, 7 sources



Texas City Hub
~12 Mta total
10 Mta, 3 sources



20 MILES

U.S. CCUS Costs by Point Source

(\$ / tonne of CO₂)

- **Activation phase** (< \$50/teCO₂ next 5-7 years)
- **Expansion phase** (\$50-90/teCO₂ next 12-15 years)
- **At-scale deployment** (\$90-110/teCO₂ next 25 years)

Assumptions

Asset Life	20 year
IRR	12%
Equity Financing	100%
Inflation Rate	2.5%
Federal Tax Rate	21%

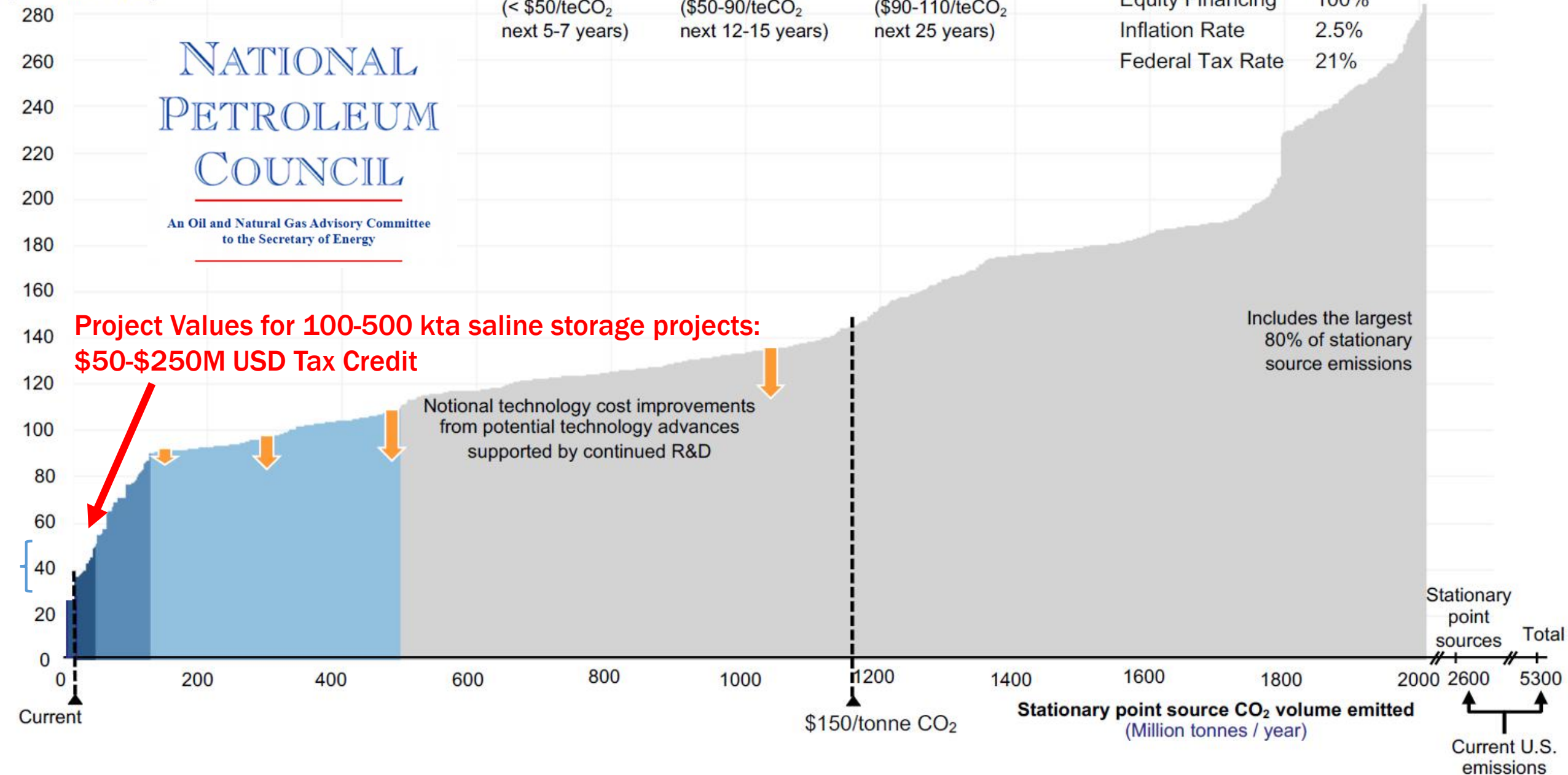
NATIONAL PETROLEUM COUNCIL

An Oil and Natural Gas Advisory Committee to the Secretary of Energy

Project Values for 100-500 kta saline storage projects: \$50-\$250M USD Tax Credit

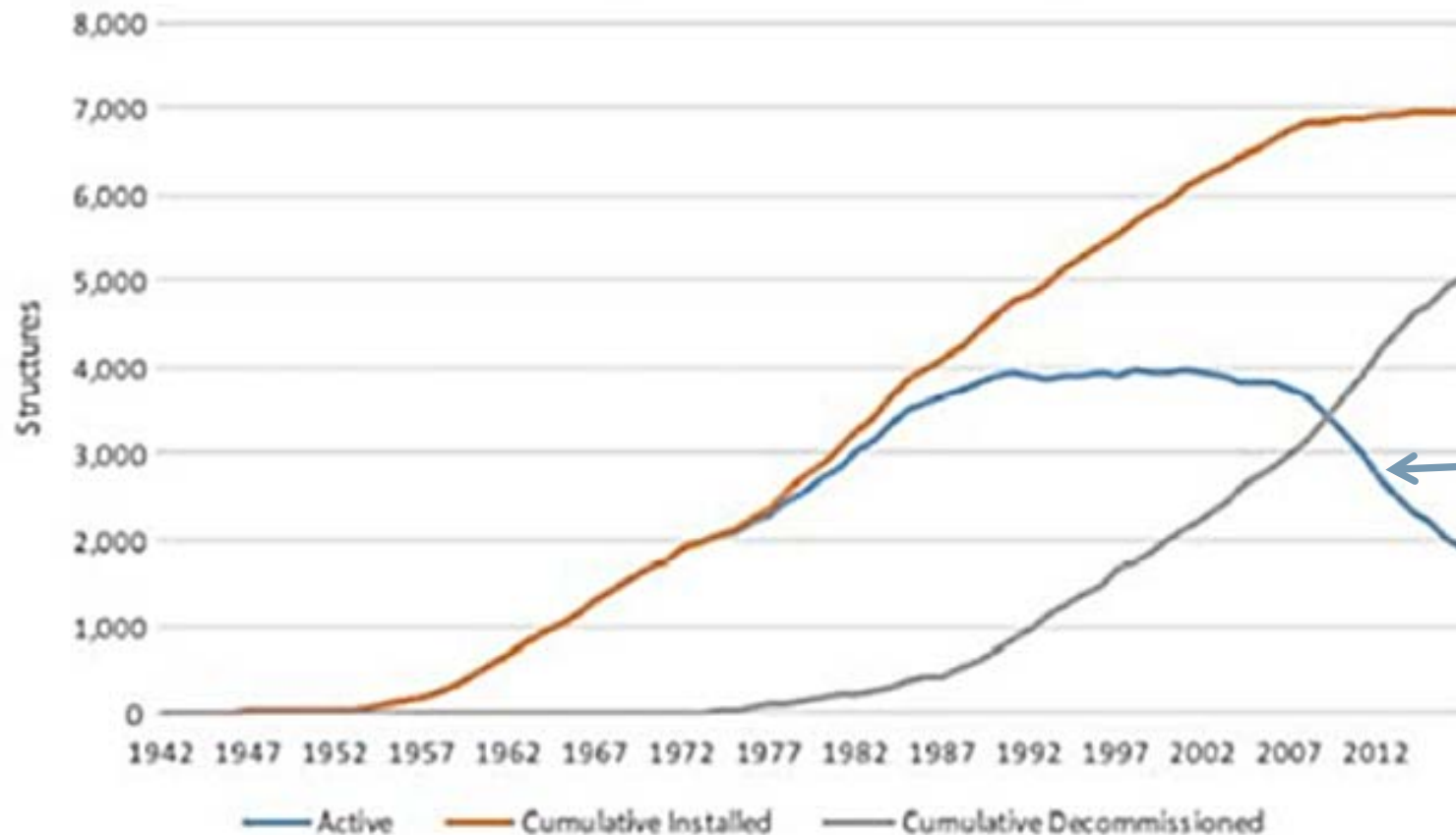
Notional technology cost improvements from potential technology advances supported by continued R&D

Includes the largest 80% of stationary source emissions



Infrastructure Re-Use Challenges– Future Stock of Reusable Infrastructure

Active structures in water depth less than 400 ft, 1942-2017E.



**Inventory for Re-use
Decreasing**

Goodbye cost savings....

Source: Kaiser and Narra, LSU
Center for Energy Studies;
Offshore Magazine, March
2018



BOEM

Source: Data from BOEM/BSEE, February 2018.

SUMMARY

- The global offshore continental margins represent the best near-term opportunity for Gigatonne-scale CCS.
 - Gulf of Mexico is ideal geologically and geographically.
 - National resource of consequence for Gt-scale.
 - **Research needs**: understand hub development and scaling, impact of Gt-scale pressure perturbation, fault performance, library of typical storage opportunities.
- ∴
- GoM ready to apply and expand upon the many successful examples.
 - North Sea, Japan, Brazil
 - CC(U)S perspectives benefit from knowing prior petroleum history: capacity, seal, reservoir performance, well development.

Acknowledgements / Thank You / Questions

We gratefully acknowledge:

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Tip Meckel, Ramon Trevino, and Susan Hovorka

tip.meckel@beg.utexas.edu



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TEXAS Geosciences
Bureau of Economic Geology
Jackson School of Geosciences
The University of Texas at Austin