CCUS Hub Development on the Gulf Coast

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U.S. DEPARTMENT OF ENERGY | Fossil Energy and Carbon Management

USEA United States Energy Association

www.gulfcoastcarbon.org

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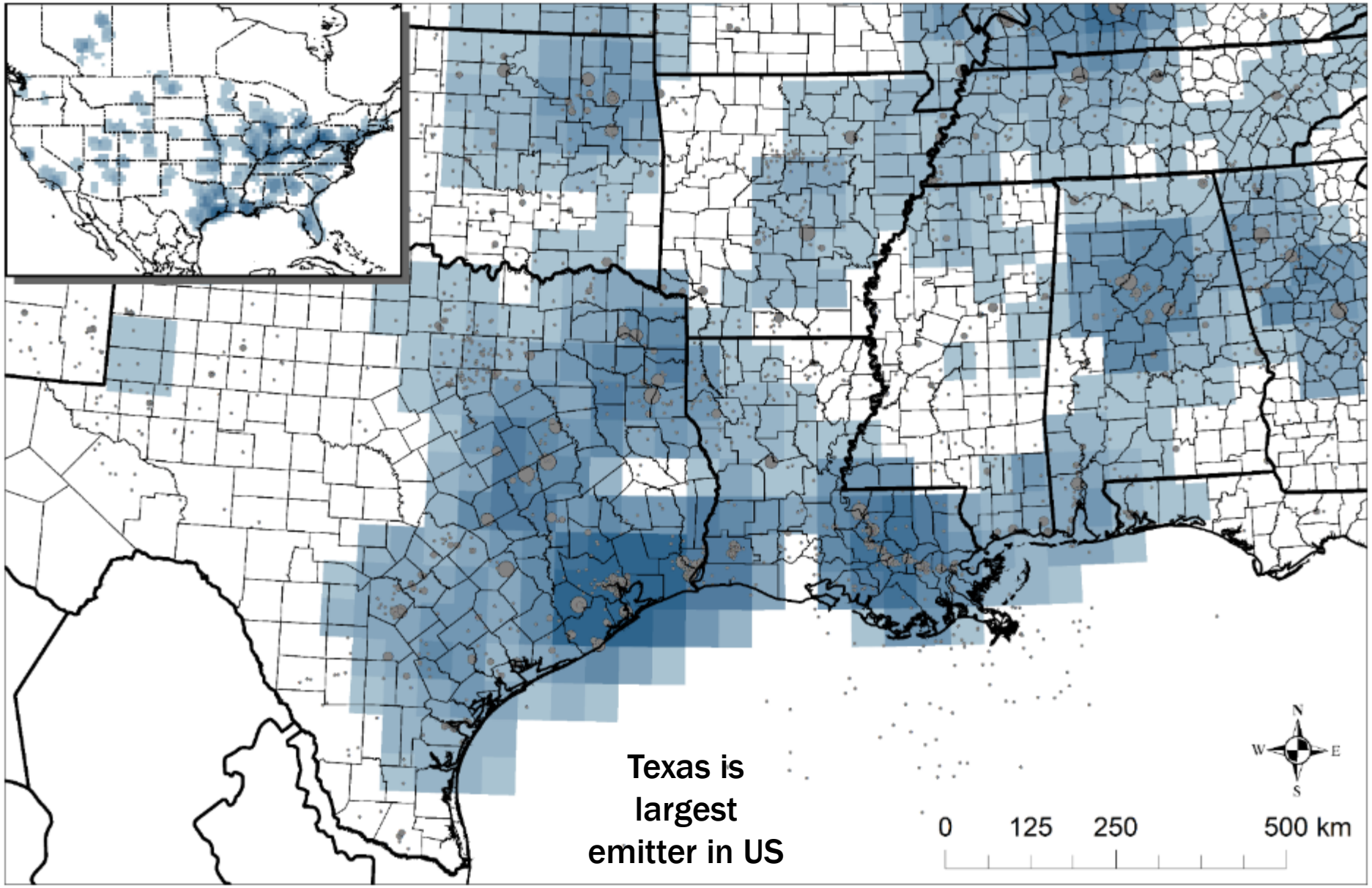
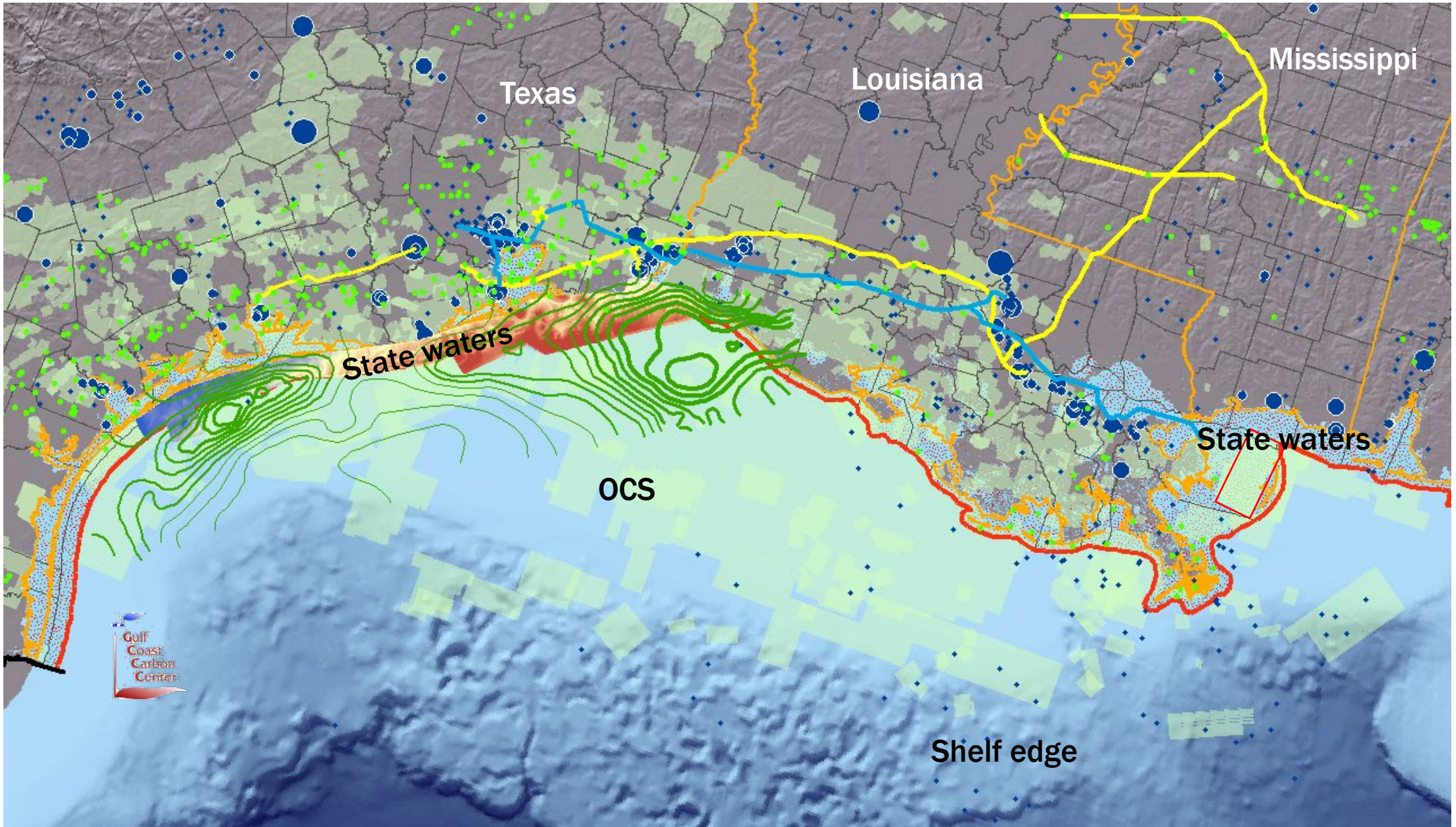
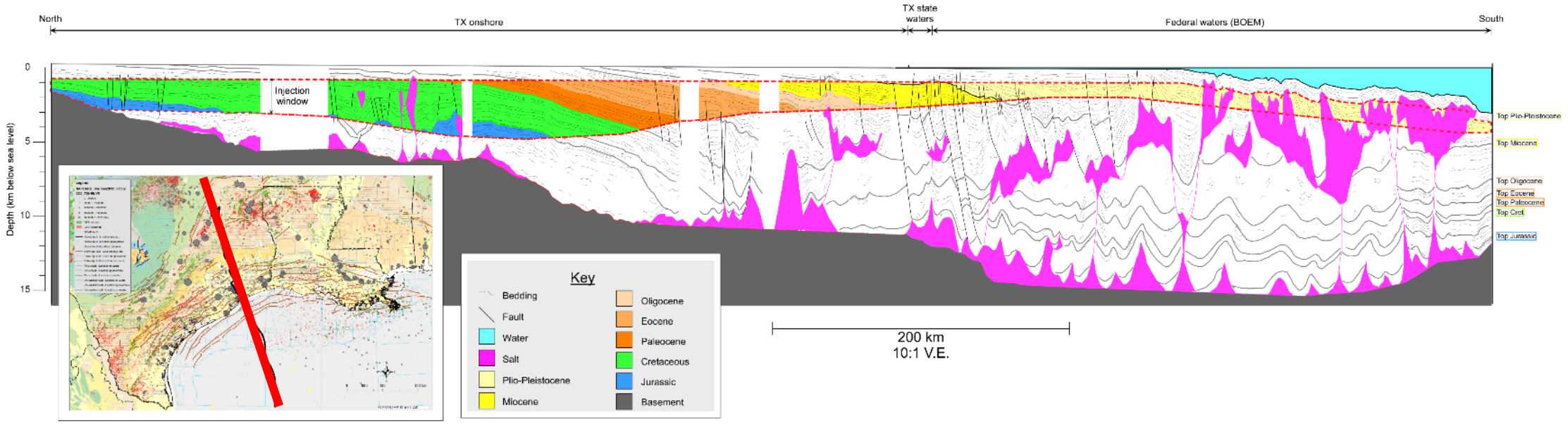
CO_2 Emissions – 'Center of Mass' heat map



Storage Readiness GoM



Storage window in GoM



Window for CO_2 storage defined by minimum pressure for supercritical CO_2 (~1km) and top of overpressure

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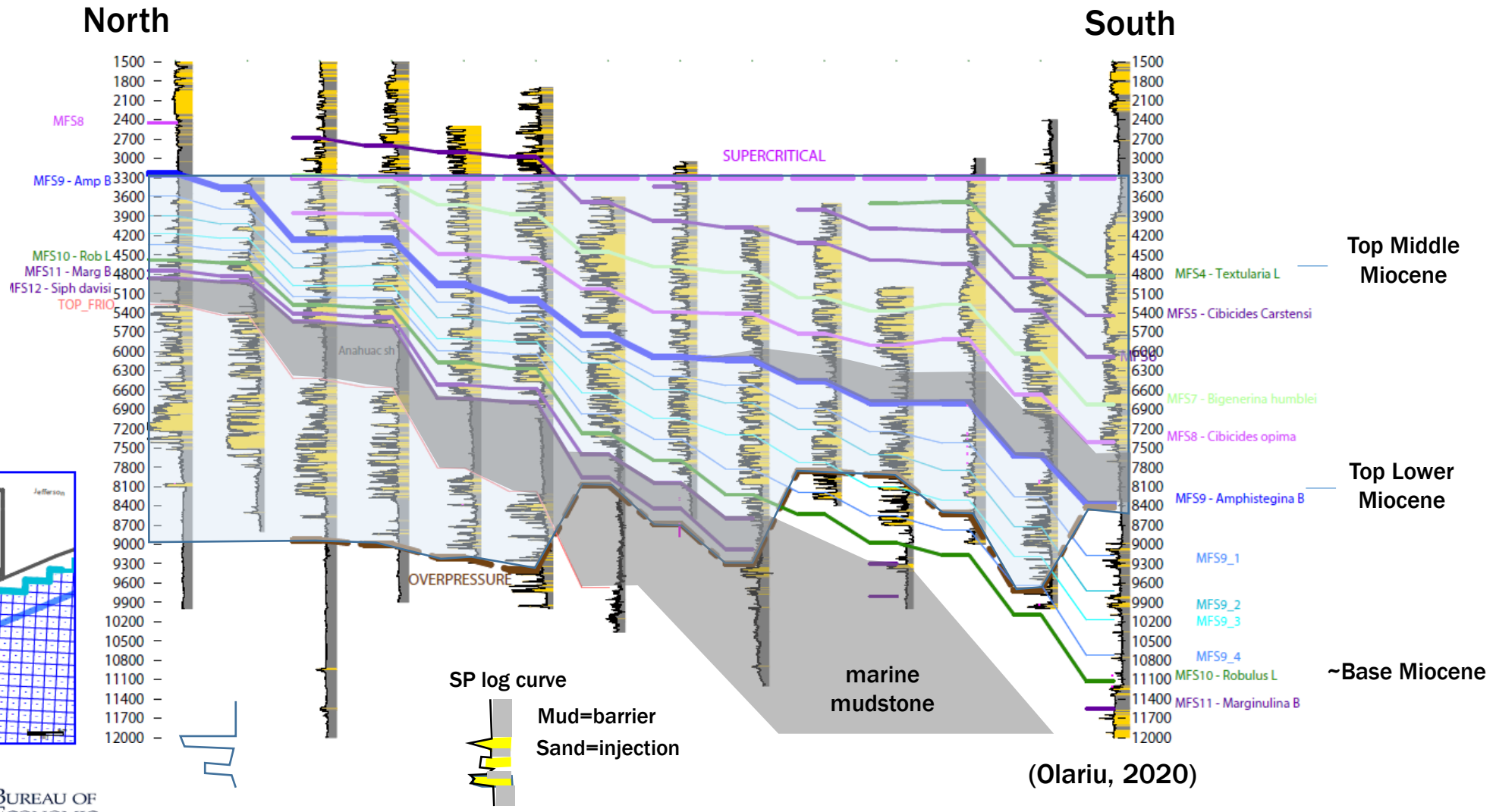
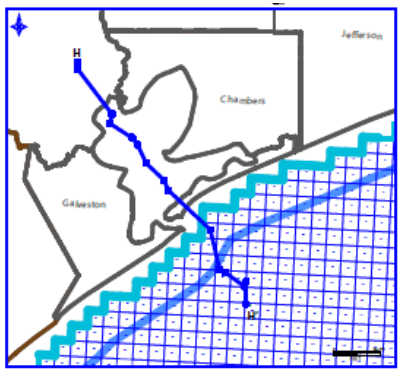
Wells: Filling in the Details





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- Open access journal article, May 2021
- https://onlinelibrary.wiley.com/doi/10.1002/ghg.2082

On the Map

Check for updates

GREENHOUSE GASES SCIENCE AND TECHNOLOGY

Carbon capture, utilization, and storage hub development on the Gulf Coast

T.A. Meckel, A.P. Bump, S.D. Hovorka and R.H. Trevino, The University of Texas at Austin, Austin, TX, USA

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Gulf Coast injectivity

15th International Conference on Greenhouse Gas Control Technologies, GHGT-15

15th - 18th March 2021, Abu Dhabi, UAE

Evaluating technical feasibility of gigaton scale CO_2 storage using produced water disposal data in US Gulf Coast

Hailun Ni[a], Ganeswara Dasari[b,*], Gary Teletzke[b], Apostolos Saris[b]

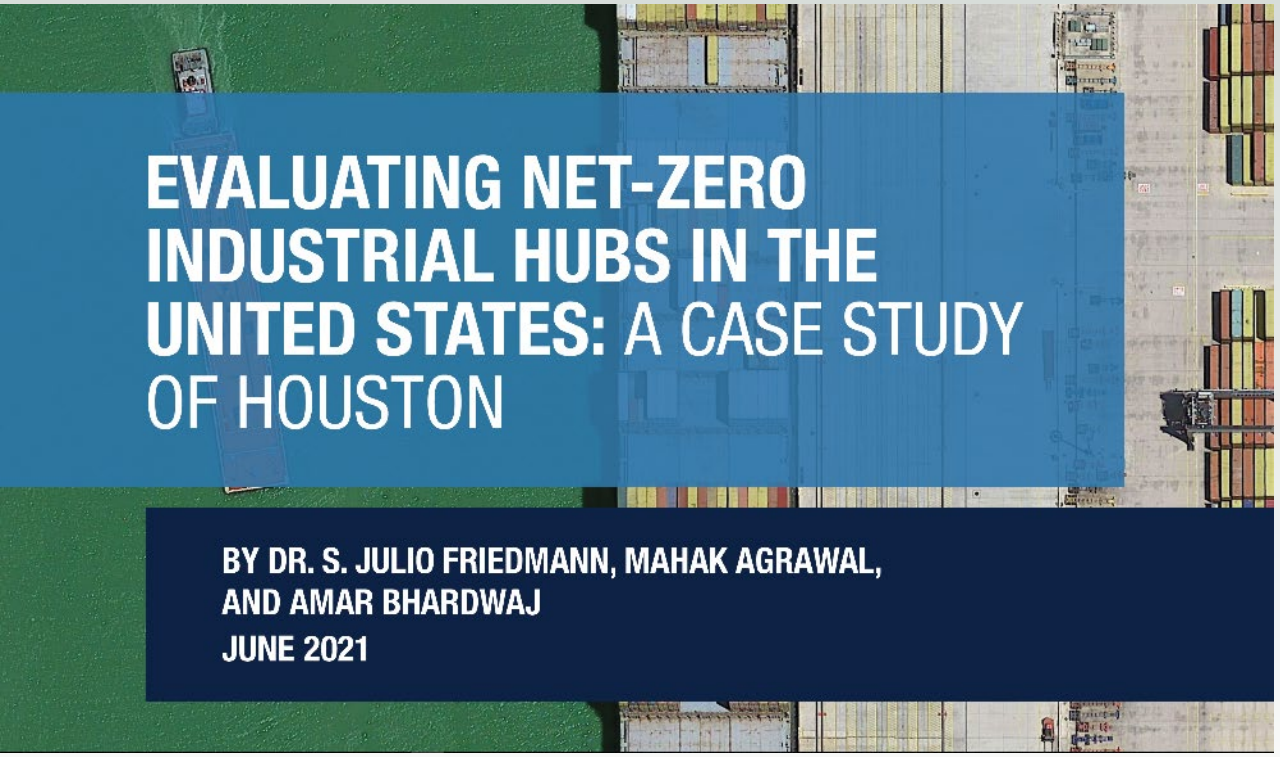
[a]*Bureau of Economic Geology, The University of Texas at Austin, Austin, TX 78758*
[b]*ExxonMobil Upstream Research Company, Spring, TX 77389*

- In the **Gulf Coast region, 1500** currently active **produced water disposal wells** can inject the volume equivalent of more than **1 GtCO2/yr** with an average injection rate of 20,000 bbl/day (**0.8 MtCO2/yr**) per well.
- Produced water injection wells with injection rates equivalent to 1 $MtCO_2$/yr already exist.
- Low pressure buildup is expected, even for high-rate injection wells in suitable storage/disposal formations.

Select press releases related to Gulf Coast

- **NextDecade LNG** in Brownsville pursuing CCS.
- **Talos Energy** and **Storegga** intend to collaborate on U.S. **Gulf CCS projects,** including **state and federal waters offshore Texas.**
- **Exxon Mobil** Houston Decarbonization Effort.
- **Talos GLO RFP recipient – 62 sq. mi. offshore Port Arthur**
- **Denbury** is exploring significant CO_2 pipeline expansion.
- **The Port of Corpus Christi announced an MoU to develop CCS offshore Corpus.**
- A federal court ruled that **Federal Energy Regulatory Commission** must reconsider the **climate** and **environmental justice** impacts of a pair of proposed **LNG terminals in Texas.**
- **Milestone Environmental Services**, LLC, one of the largest independent providers of energy waste sequestration services in the U.S., announced the creation of a **new CCS business unit** for **middle market emitters**.
- A **CCS test well program** has been successfully completed at **Strategic Biofuels**' green fuels (wood-to-diesel) project in Columbia, **Caldwell Parish, LA**.

Select press releases related to Gulf Coast



Contact: Scott Castleman (304-421-2057, scott@locuststreet.com)
Kelly Klass (609-713-4243, kelly@locuststreet.com)
Contacts for individual companies provided at end of release

Carbon Capture and Storage Gains Wide Industry Support in Houston

- Eleven companies support large-scale deployment of carbon capture and storage to help decarbonize industrial facilities; discussions ongoing with others
- Collective efforts could capture and store approximately 50 million metric tons of CO_2 per year by 2030; 100 million by 2040
- Companies bring collective expertise as industry leaders with diverse capabilities

GCCC Gulf Coast Carbon Center | Bureau of Economic Geology

TEXAS GENERAL LAND OFFICE / SCHOOL LAND BOARD

REQUEST FOR PROPOSALS
for
Lease of Permanent School Fund Land
for Storage of Carbon Dioxide

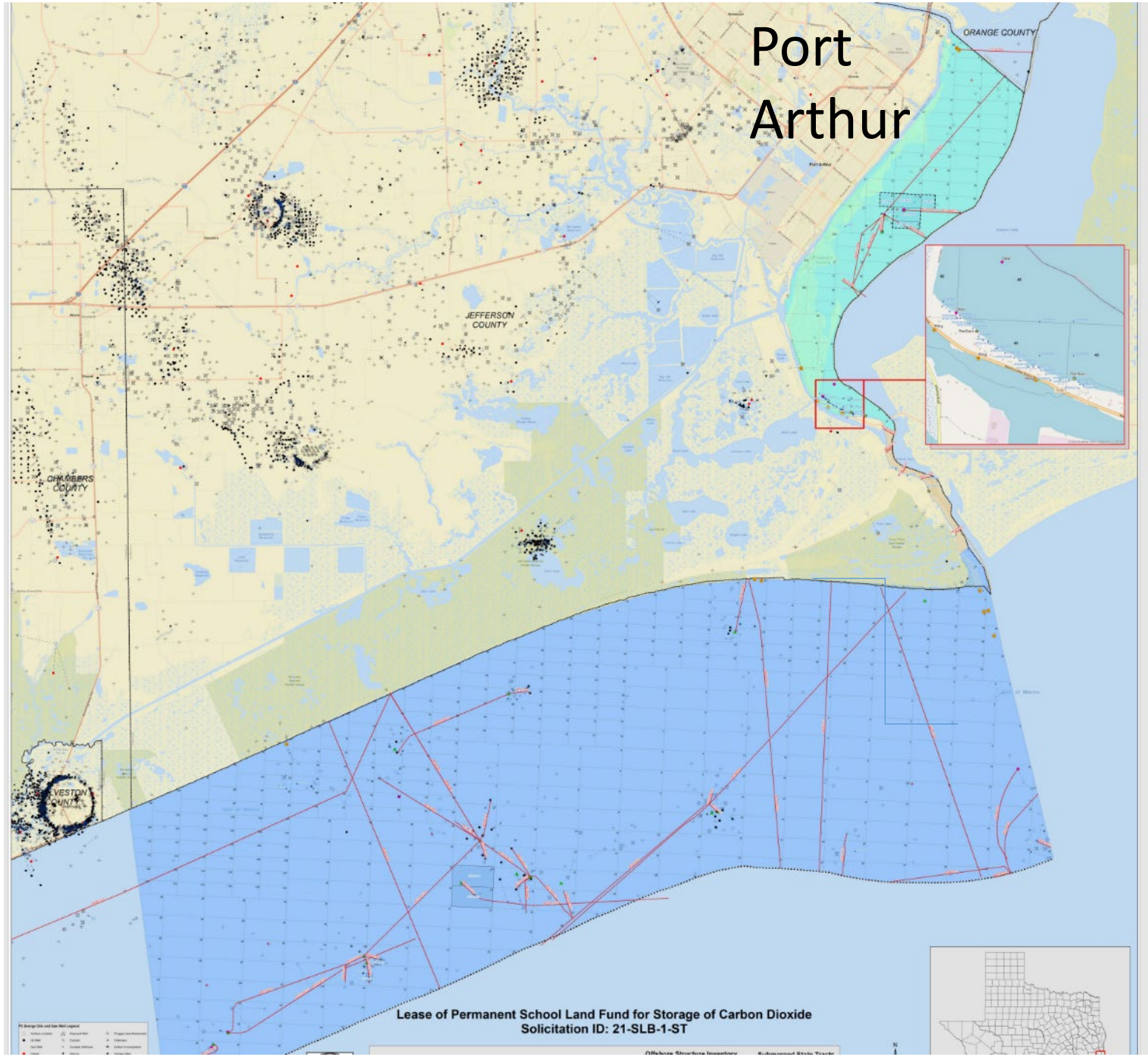
REQUEST FOR PROPOSALS NO. 21-SLB-1-ST

Class 926 / Item 25; Class 926 / Item 90; Class 926 / Item 91; Class 925 / Item 15; Class 925 / Item 43; Class 925 / Item 45; Class 925 / Item 46; Class 493 / Item 42

Release Date: April 7, 2021
Deadline for Submission: May 10, 2021 at 2:00 p.m. CDT

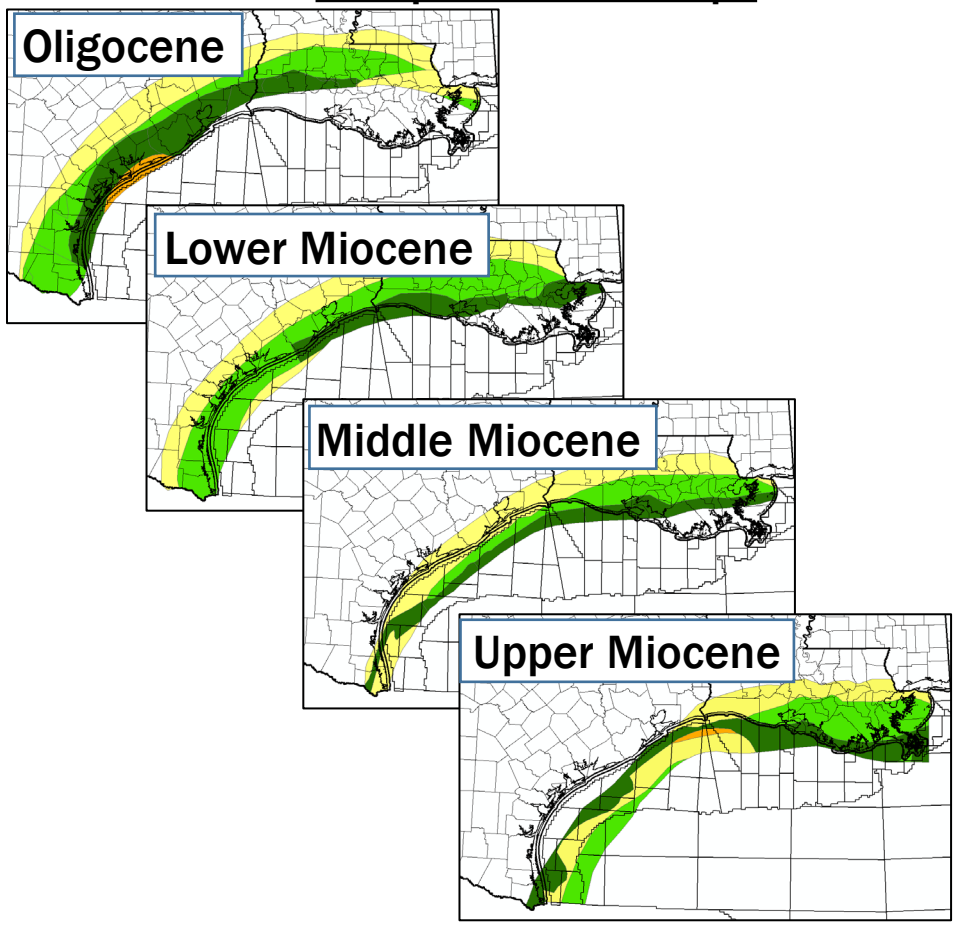
Solicitation Point of Contact: Susan Tipton-Hines, CTCM, CTCD
Susan.Tipton-Hines@GLO.Texas.Gov

You are responsible for checking the Electronic State Business Daily (ESBD) website, http://www.txsmartbuy.com/esbd, for any addenda to this Solicitation. Please search under Agency Code 305 (General Land Office and Veterans Land Board). The Respondent's failure to periodically check the ESBD will in no way release that Respondent from addenda or additional information resulting in additional requirements of the Solicitation.

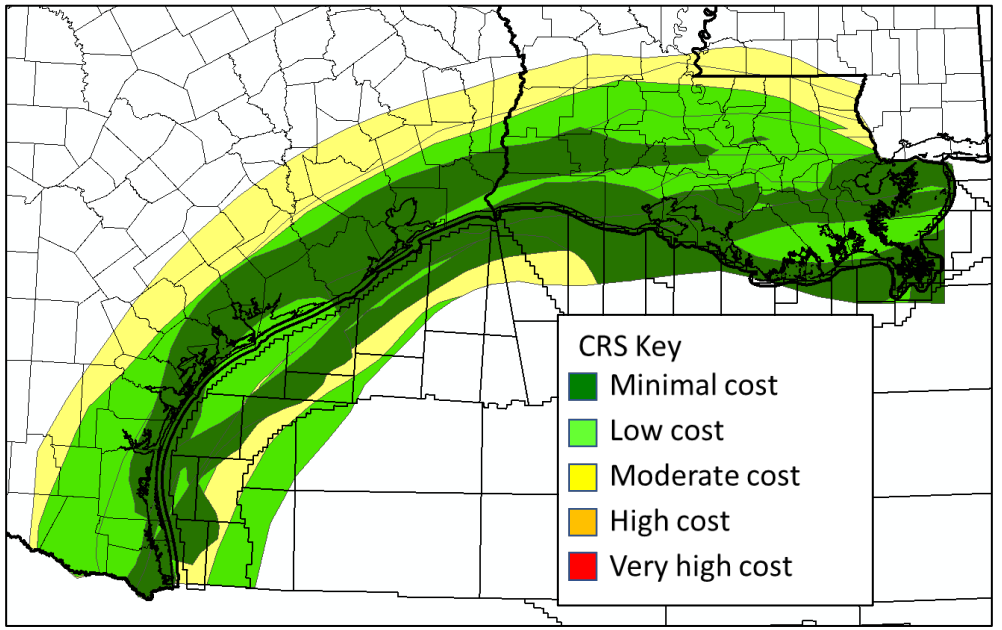


Storage Fairway Mapping using Composite Risk Segment mapping

Composite CRS Maps



Composite of Composites:



Note that yellow fringes will likely disappear with as we add mapping of younger and older stratigraphy

Bump et al in review

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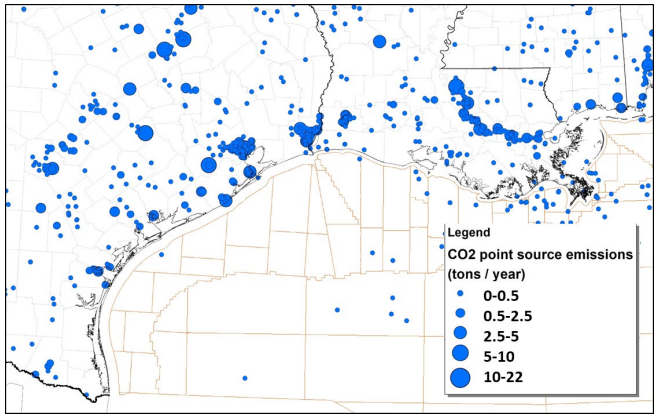
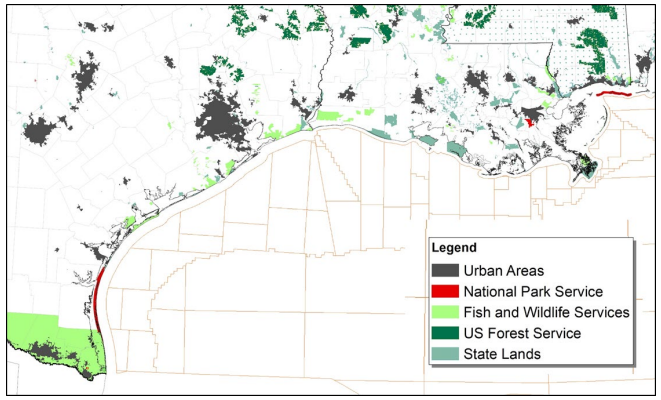
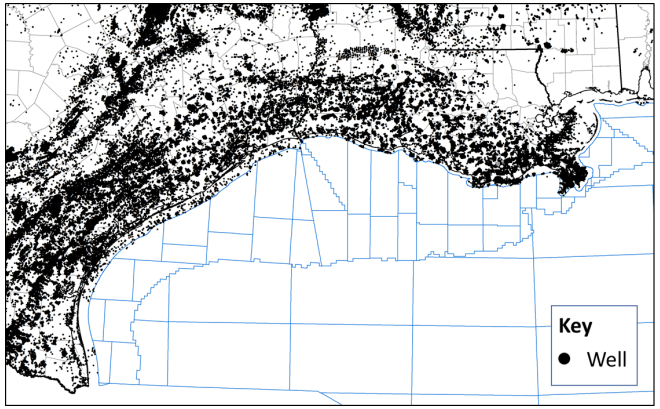
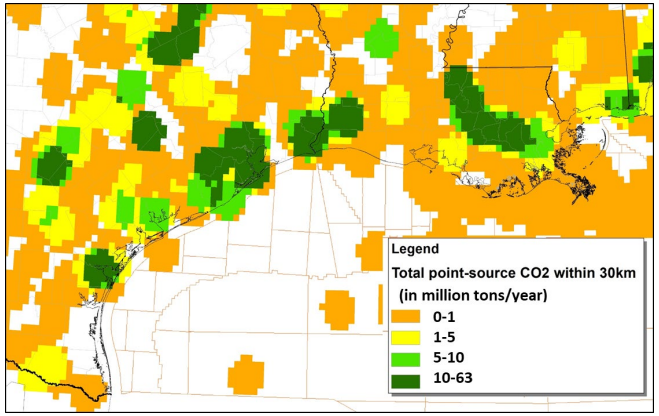
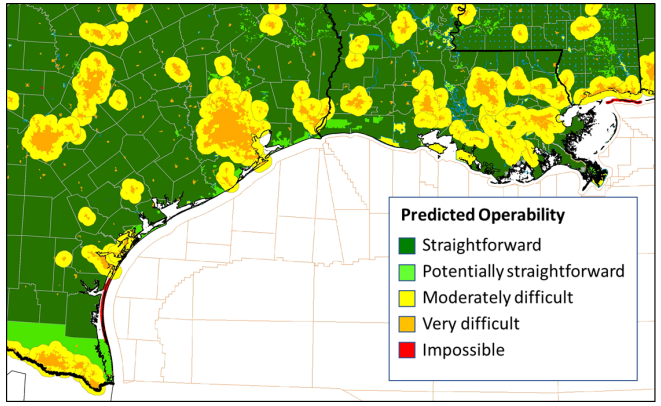
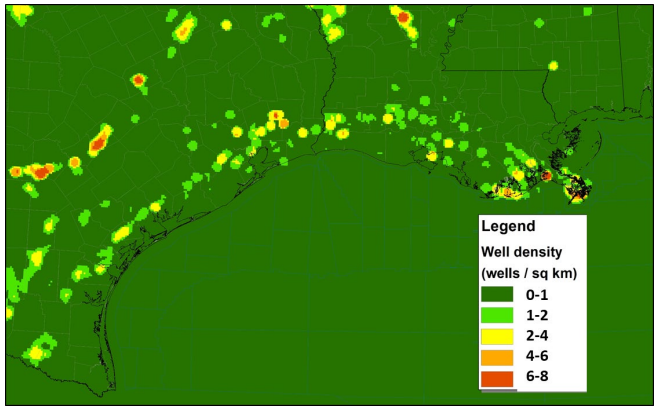
Add Other Layers As Needed

	Point-Source CO_2 Emissions	Land Use	Legacy Hydrocarbon Wells
Input Map			
Minimum requirement	distance	access	well density
CRS Map			

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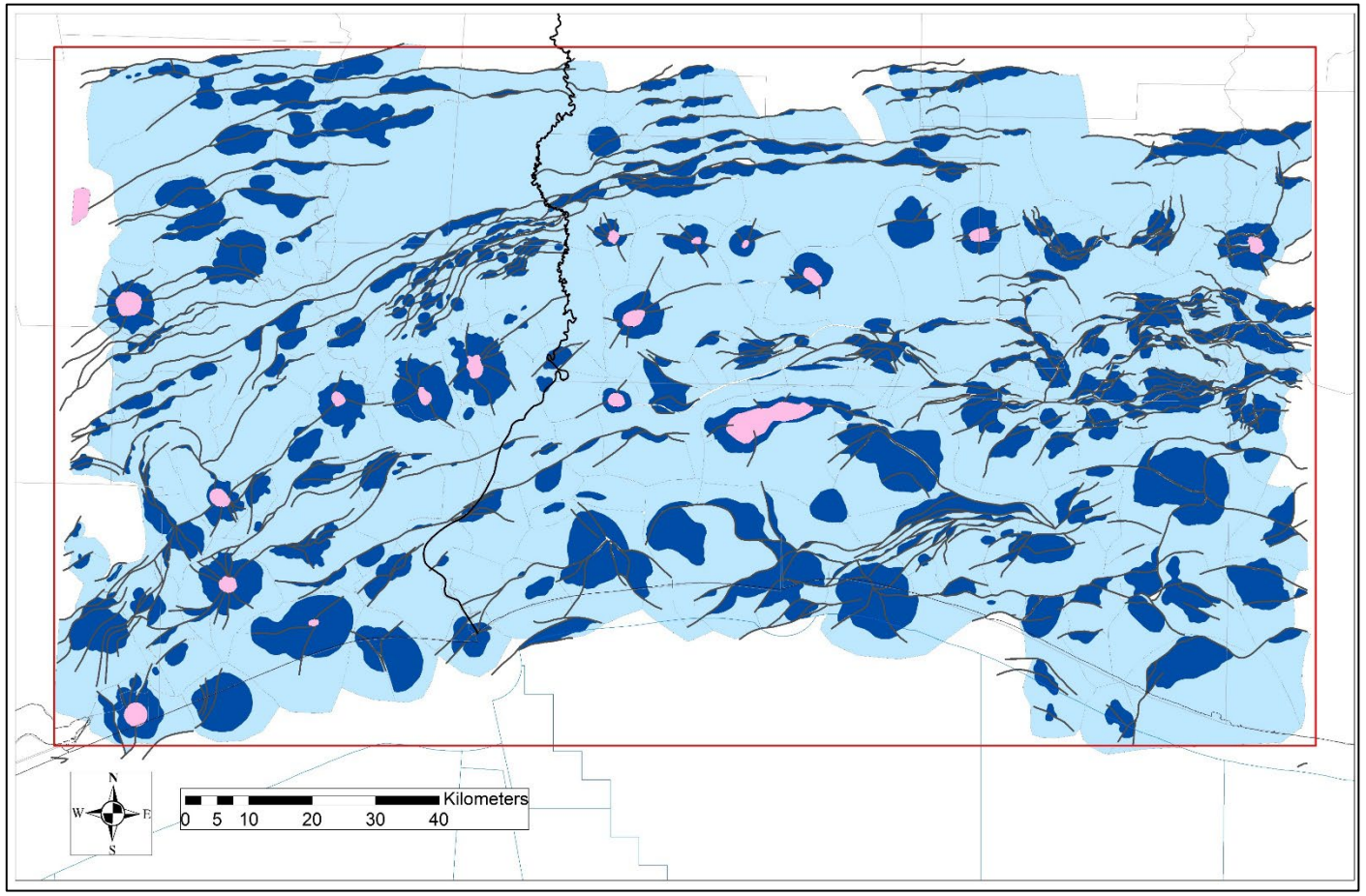
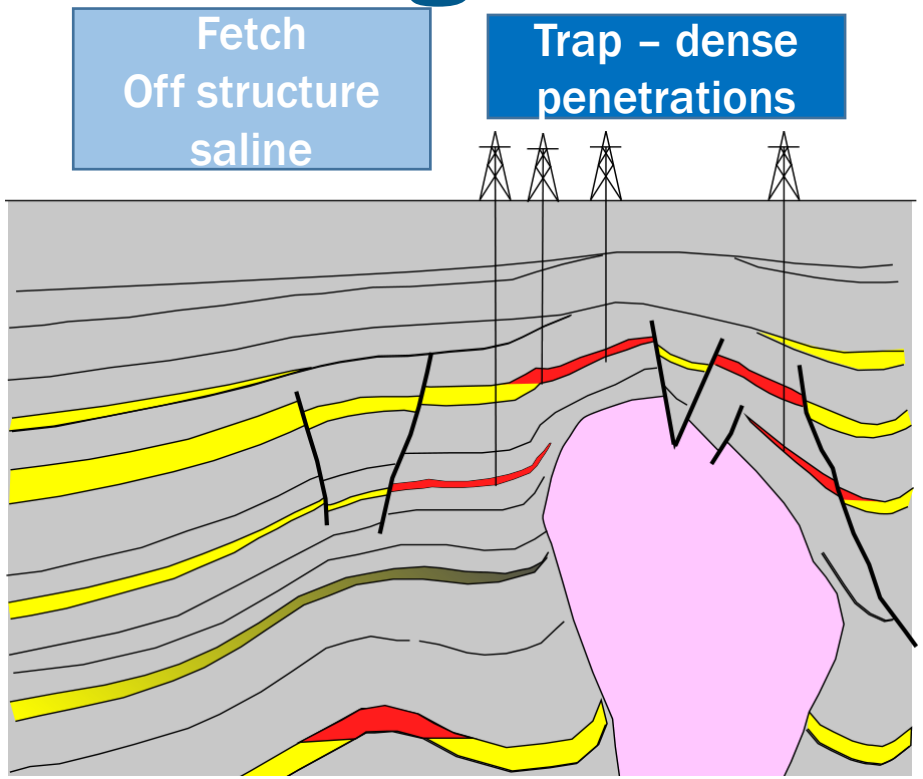
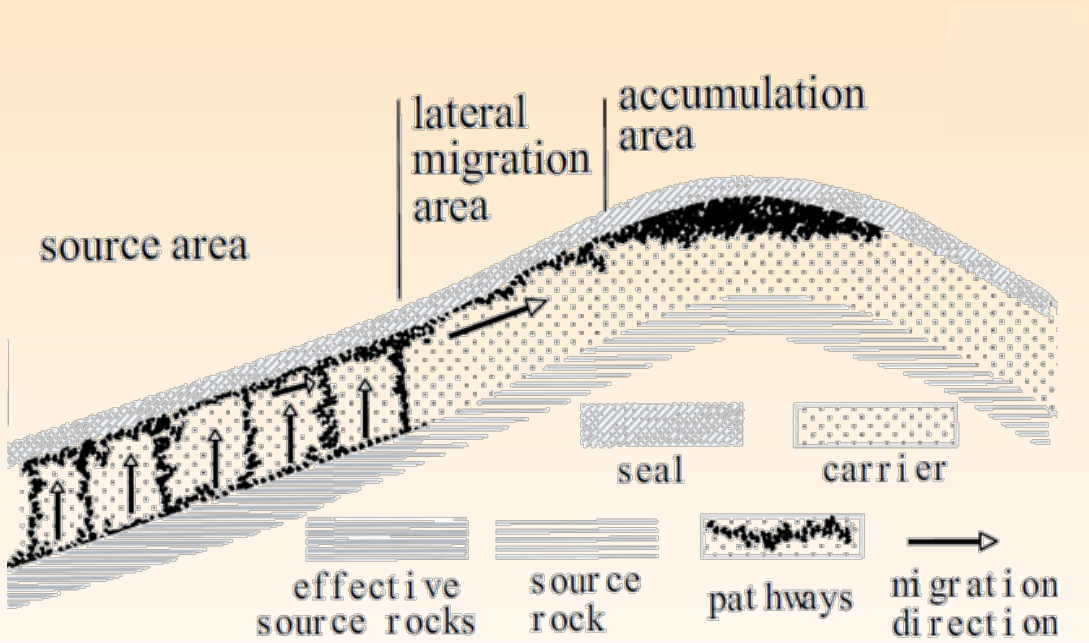
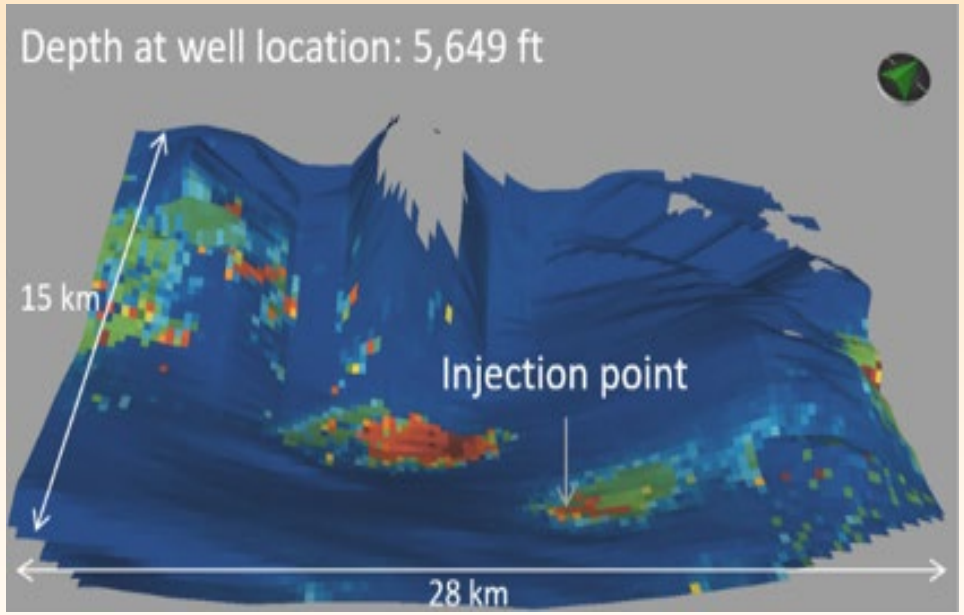
More detailed look at storage



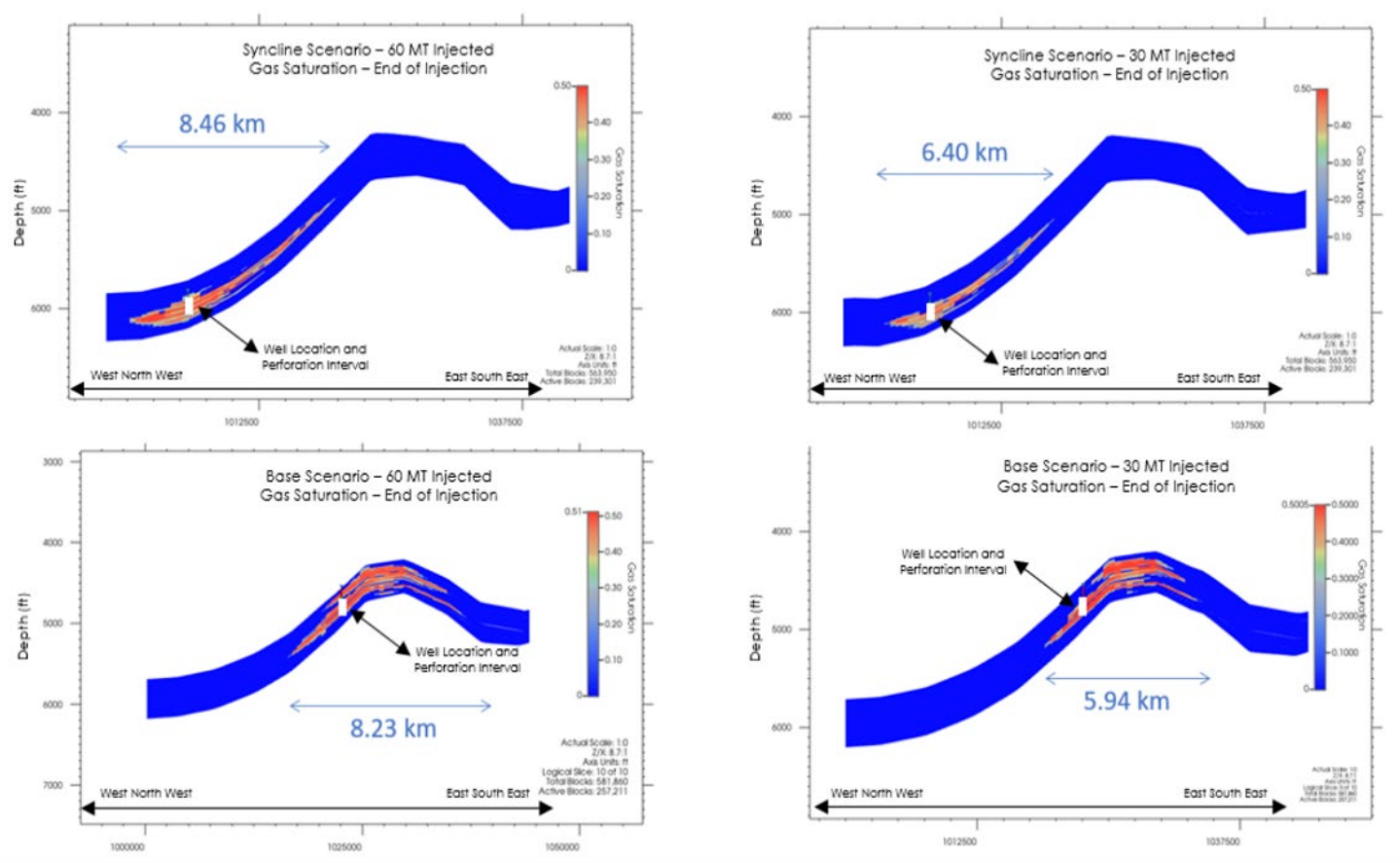


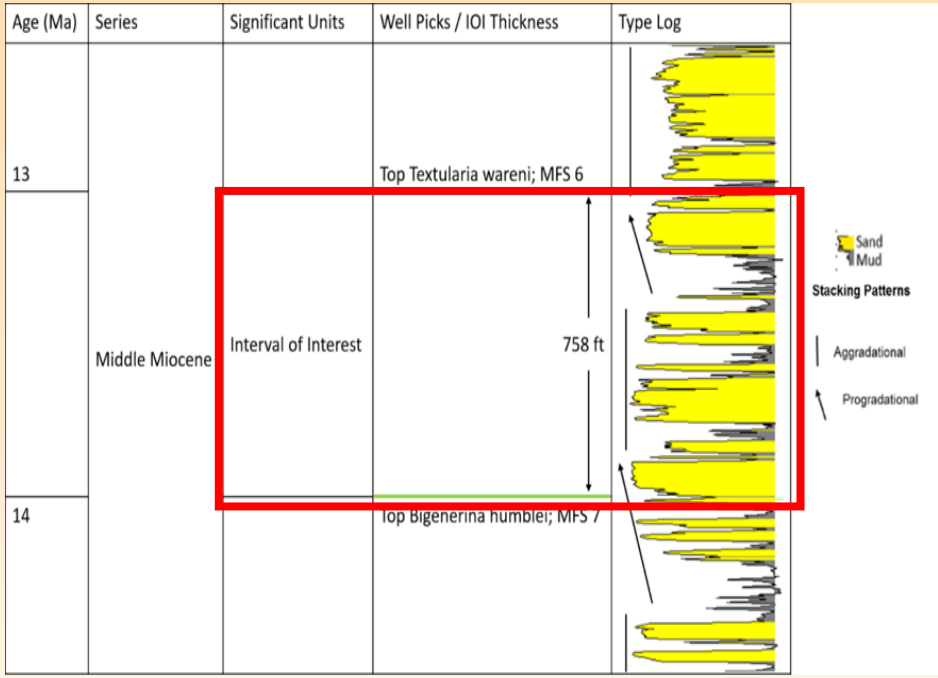
Comparing storage in fetch to storage in trap





Ulfa, 2021, MS Thesis, UT-Austin: The Impacts on Pressure Stabilization and Leasing Acreage for CO_2 Storage from Utilizing Oil Migration Concepts

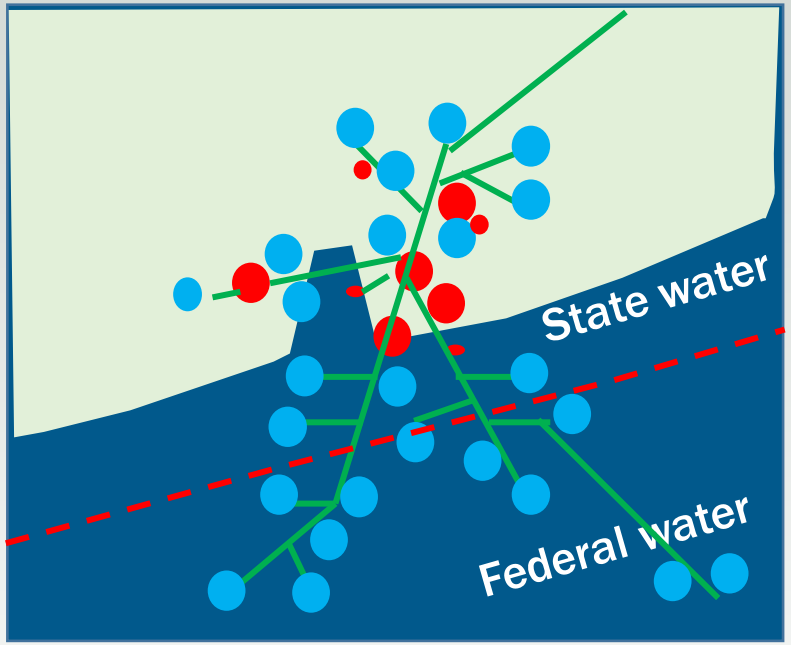




Case	Total CO_2 injected (million tons)	Plume size after 30 years of continuous injection	Plume size 100 years after injection stops	Maximum Storage/Acreage ratio (million tons/km^2)
Syncline scenario	60	47.66 km^2	67.73 km^2	0.88
	30	31.83 km^2	44.84 km^2	0.67
Base scenario	60	50.27 km^2	50.27 km^2	1.19
	30	26.81 km^2	26.81 km^2	1.12

Ulfa, 2021, MS Thesis, UT-Austin: The Impacts on Pressure Stabilization and Leasing Acreage for CO2 Storage from Utilizing Oil Migration Concepts

Storage hub concept GoM conditions



Aggregating 0.2 to 10MMT/y diverse point sources

CO_2 pipeline

30MMT storage complex

Saline storage
Depleted gas or oil field
EOR

High concentration sources
Ammonia
Ethelene cracker
SMR (hydrogen)
LNG Liquification

Lower concentration sources
Gas-fired power
Some coal fired power
Industrial heat and compression

Growth
LNG
Refining
Other low carbon?

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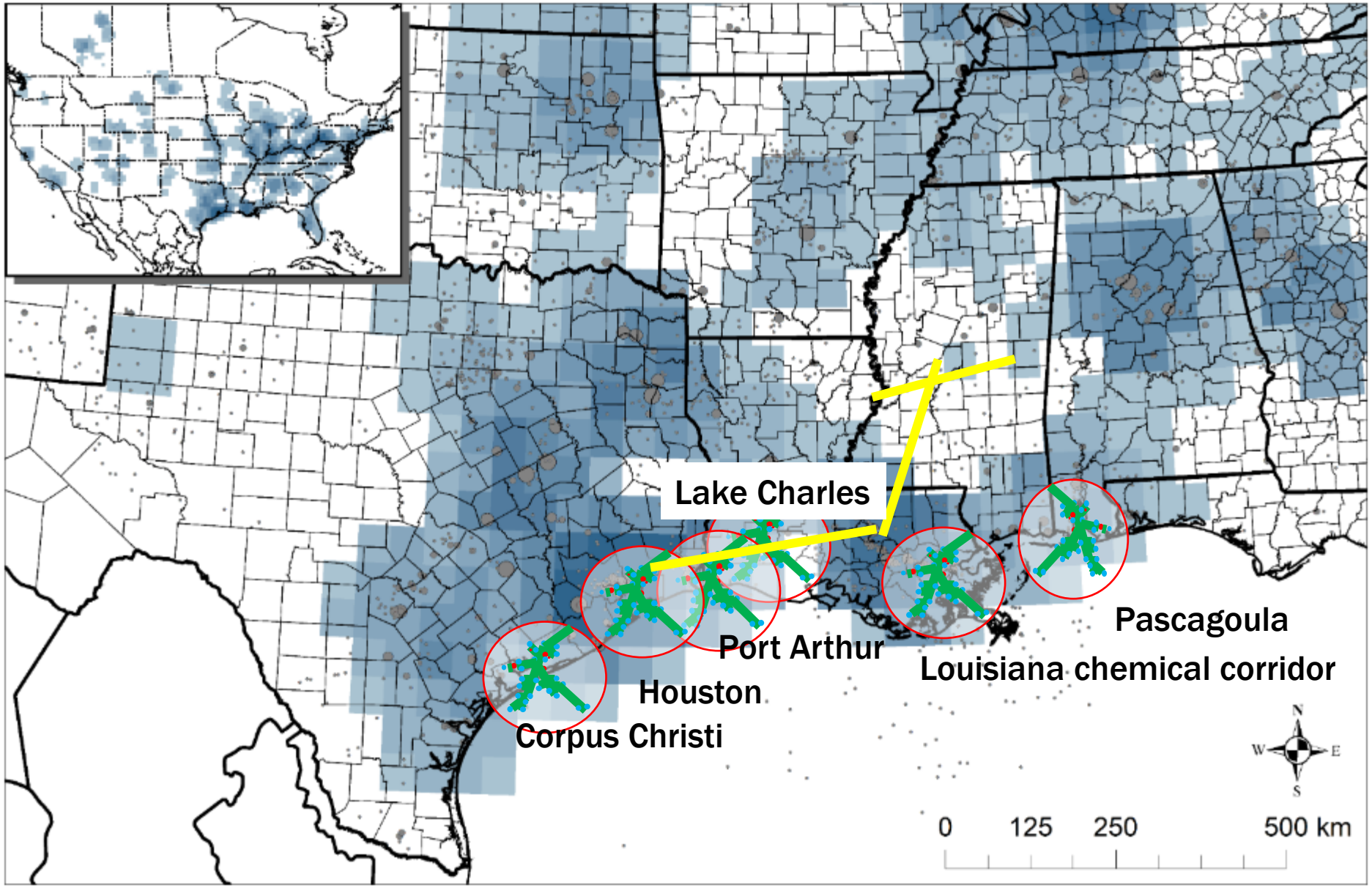
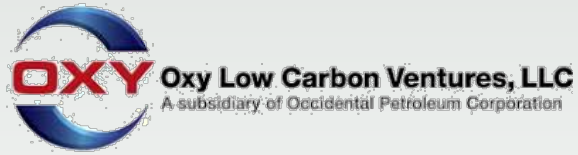
Hub Concept applied to GoM



Thank You GCCC Sponsors



The US Gulf Coast is poised for rapid methane and CCS development