

Gulf Coast Carbon Center Research Activities

Susan Hovorka and GCCC team



**UTCCS-7
January 23–25, 2024
UT Austin, Austin, TX**

Gulf Coast Carbon Center (GCCC)

- An Industrial Associate Program
 - Membership by industrial sponsors to support research
- Research designed to move CCS at large scale forward rapidly
 - Global work but Gulf of Mexico basin focus because of proximity of sources and sinks
 - Opportunity to invest in front of needs
 - What information and expertise will be needed four years from now?
- Four year aspirational “Big Plan”



GCCC Staff and friends at CCUS conference 4/2023

Thanks to Sponsors of the GCCC



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The Gulf Coast Carbon Center



We seek to impact global levels of atmospheric carbon dioxide (CO₂) by:

- Conducting studies, often focusing on the Gulf of Mexico, in regard to geological storage, retention and monitoring of CO₂ in the deep subsurface
- Educating the public about the process of geological CO₂ storage, the risks and mitigation measures associated with carbon capture and storage deployment
- Enabling the private sector to develop an economically viable industry to store CO₂ in the Gulf of Mexico, across the U.S., and globally

Geologic Characterization



Carlos Uroza

Alex Bump

Timothy Meckel

Mariana Olariu

Fluid-Flow Modeling



Seyyed Hosseini

Sahar Bakhshian

Hailun Ni

Surface or Deep Monitoring



Katherine Romanak

Susan Hovorka

Energy Economist



Ramon Gil

Communications Coordinator



Dolores van der Kolk

International Research Fellows



Tim Dixon, IEAGHG, UK

Charles Jenkins CSIRO, Australia

Seismic Interpretation



Michael DeAngelo

Dallas Dunlap

Tucker Hentz

Ramón Treviño

Graduate Students



Sawsan Almalki

Previna Arumugam

Sean Avitt

Germán Chaves

Chris Deranian

Ismail Halim Faruqi

Richard Colt Larson

Maria Paula Madariaga

Chinemerem Okezie

Argenis Pelayo

Shadya Taleb Restrepo

Jose Eduardo Ubillus

Postdoctoral Fellows



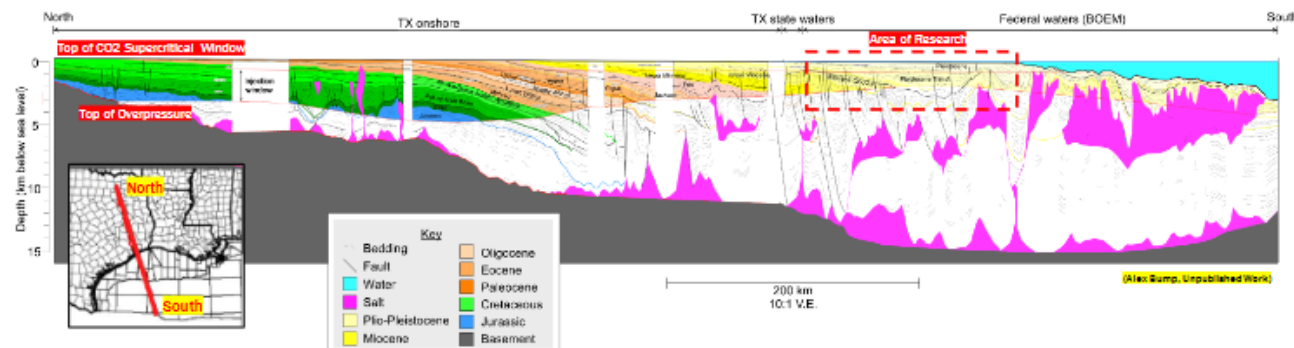
Hongsheng Wang

Zhicheng (William) Wang



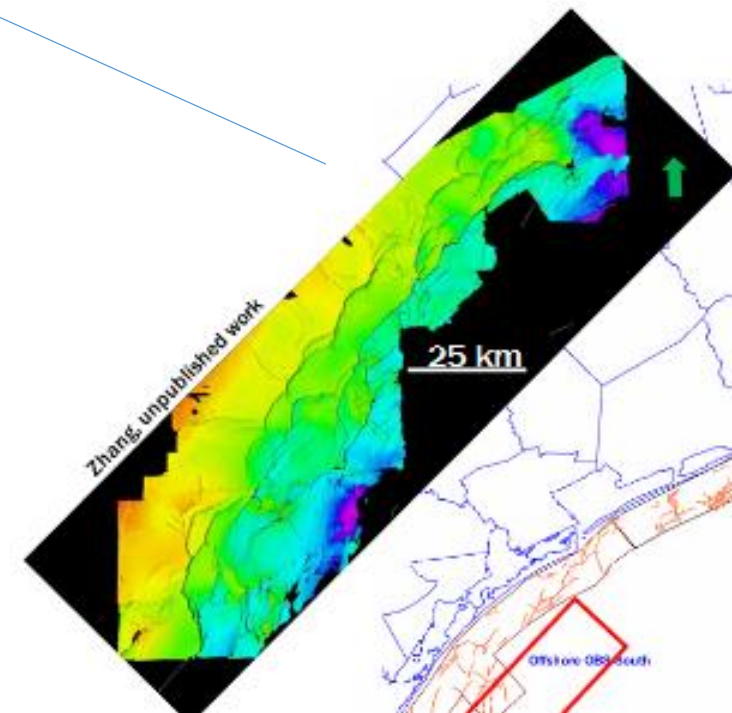
GCCC Multi-year “Big Plan”

- 4 year timeline – Questions not answered today, need answers in 4 year window
- Aspirational - studies to set up to leverage GCCC sponsors investments by bringing in funding from DOE, GLO, EPA BOEM etc.
 - **Optimizing Storage in Space and Time**
 - **Business Enablers**
 - **Getting the Message out on CCS**
 - **Providing Storage Assurance for Everybody**
 - **Hunting Success—Where Next?**
- In collaborations with sponsors GCCC supports project elements with R&D needs.



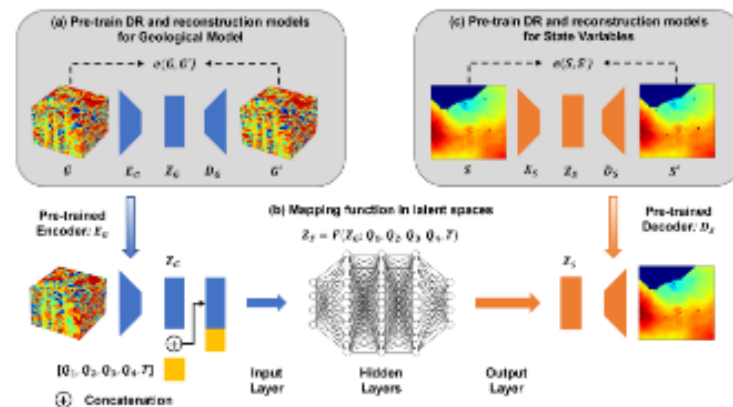
Optimizing Storage in Space and Time

- Inventory of the publicly announced storage projects on the Gulf Coast (Bump)
- Boundary conditions, potential for interference among projects, and experience with produced water as a proxy for CO₂ injection (Bump and Okezie)
- Need for standardizing calculation storage capacity (Meckel)
- Need for regional synthesis of the Gulf Coast Oligocene (Uroza)
- Assessment of new updip storage options, Eocene Wilcox Formation
 - Wilcox facie synthesis (Madariaga)
 - Impact of an up dip fresh water aquifer on storage (Avitt)
- Value of information in delineating Area of Review (Almaki)
- Developing experimental devices for assessing fluid flow (Larson)



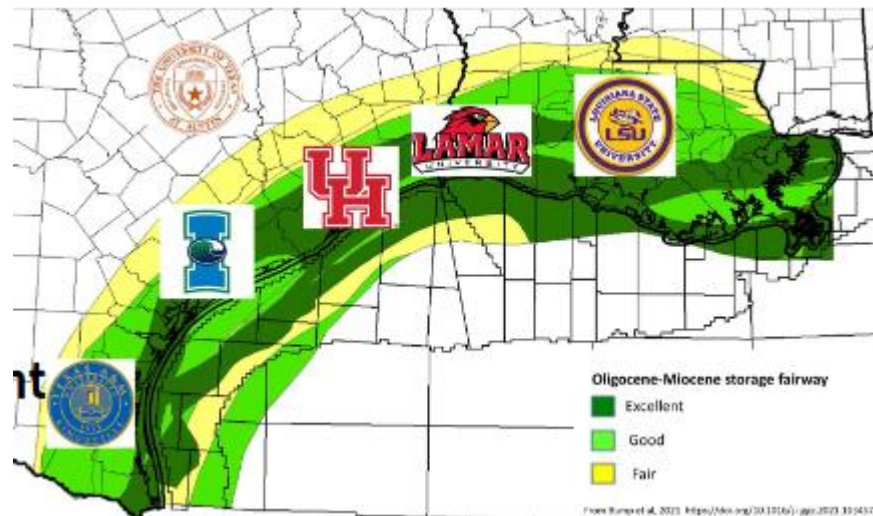
Business Enablers

- Exemptions for CO₂ storage in brackish water (Romanak)
- Financial risk in storage containment – data from new class VI permits (Palayo)
- Communication with stakeholders – Machine Learning (Wang)
- Insurance for leakage risk - (Bakhshian)
- Financial implications of limited injectivity in compartmentalized reservoirs (Deranian)
- Evolution of CCS funding mechanisms: 45Q versus Offsets (Dixon)
- Paris Agreement Article 6.2 and 6.4 Carbon Markets and the Global Stocktake (Meckel)



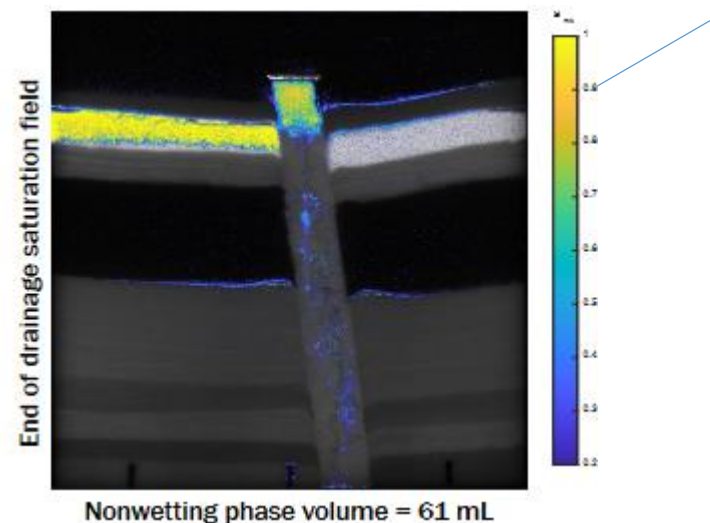
Getting the Message out on CCS

- COP28 Perspective: What People Don't Understand (Romanak and Dixon)
- New outreach team starts: Texas Louisiana Carbon Management Community (Luciano)
- Update on GCCC outreach: web publications and activities (van der Kolk)



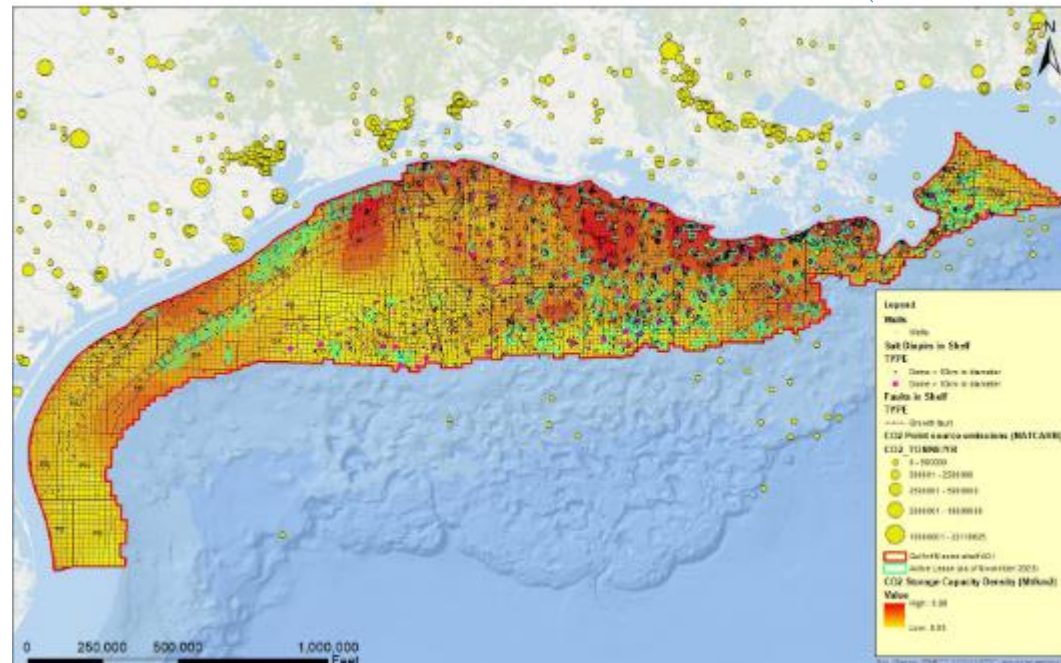
Providing Storage Assurance for Everybody

- Well Sentinel: Monitoring of Plugged and Abandoned Wells (Bakhshian)
- Advanced Energy Consortium's Microsensor Technologies for CC(U)S MRV (Ahmadin)
- Channels, Faults and CO₂: Modeling Plume Growth in an Anisotropic World (Chaves)
- Detection and Mitigation of Unintended Lateral Migration of CO₂ Plumes (Arumugam)
- Making Seismic Monitoring More Effective with Rock Physics Theory (Bhattacharya)
- Using Sand Tank Experiments to Model and De-Risk a CO₂ Injection Field Project (Ni)



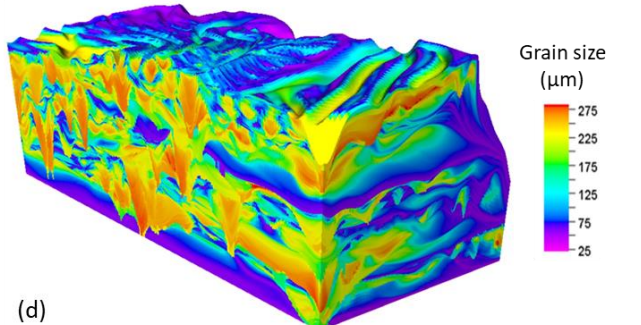
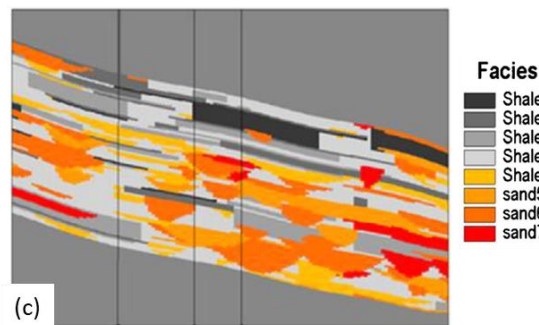
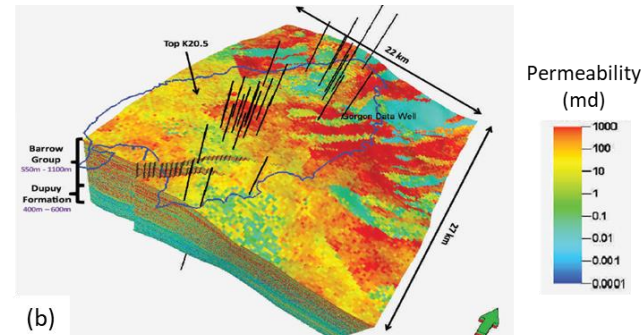
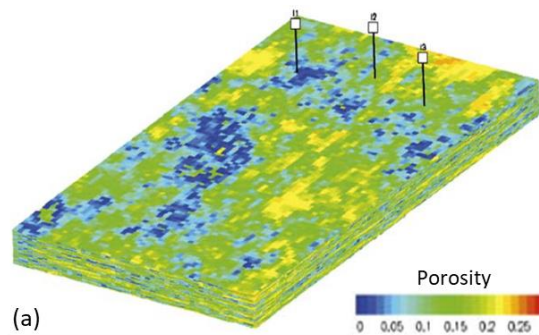
Hunting Success—Where Next?

- Future Funding Outlook: RITAP, CarbonSTORE, CarbonBASE, & Offshore Basins (Meckel)
- Storage Potential of Federal Waters, GOM Shelf (Faruqi)
- New Storage play Uncovering the Potential of the Lower Cretaceous for CCS (Okezie)



Workshops

- Best Practices in Dynamic CCS Modeling (Hosseini)
- Round Table Discussion about Handling Societal Aspects of CCS: Community Engagement, Community Benefits, Environmental Justice, etc. (Romanak, Hovorka, Gil-Egui)



Hossieni et al in prep

Sponsor Guidance

- Unmet Needs & New Topics
- Sponsor feedback

Thank you

Feel free to contact susan.Hovorka@beg.utexas.edu

Want to sponsor GCCC?

dolores.vanderkolk@beg.utexas.edu for more
information



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