



Seismic Velocity Modeling in CO₂ Saturated Samples From Cranfield Field, MS

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Advisor: Kyle Spikes

THE UNIVERSITY OF TEXAS AT AUSTIN

JACKSON

SCHOOL OF GEOSCIENCES

Personal History

- Colgate University
BA: Geology
- Fugro NV
Geologist/Engineering Geologist
- The University of Texas at Austin
PhD Program
Kyle Spikes
CO₂ Sequestration and Rock Physics
Modeling

Cranfield Area

- Discovered 1946
- Abandoned 1965
- 1 Injection wells
- 2 Observations wells
- Injection started Dec 1th 2009



Project Information

- CO₂ Injection
- Seismic 3/4D
- Well Logs
- Cores
- 1 million tons
- Observation well F-2
- Observation well F-3
- BEG M1
- BEG M2
- Injection well F-1

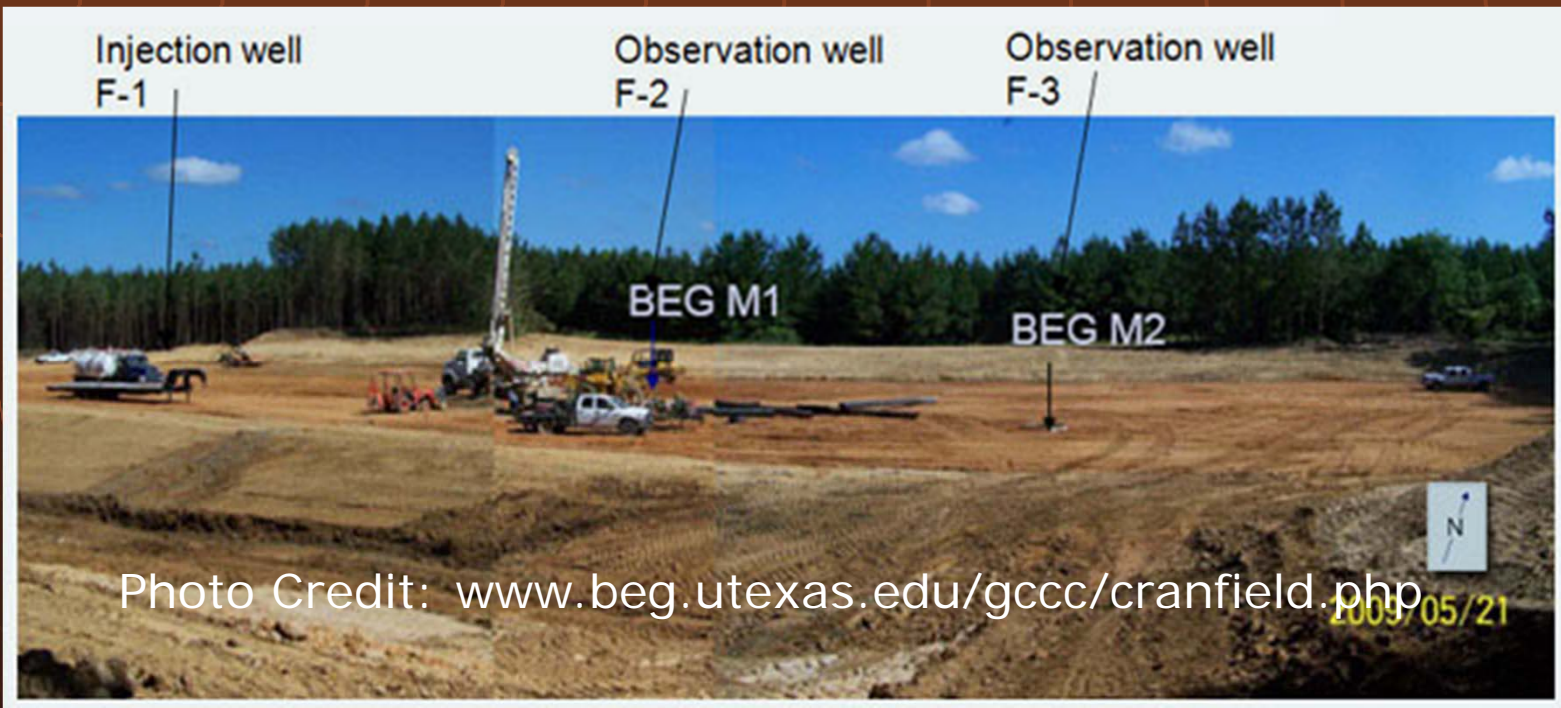


Photo Credit: www.beg.utexas.edu/gcc/cranfield.php

Anticipated Obstacles

- Destructive testing methods for velocity sampling eliminates repeatability
- Possible velocity anisotropy
- Upscaling and dispersion

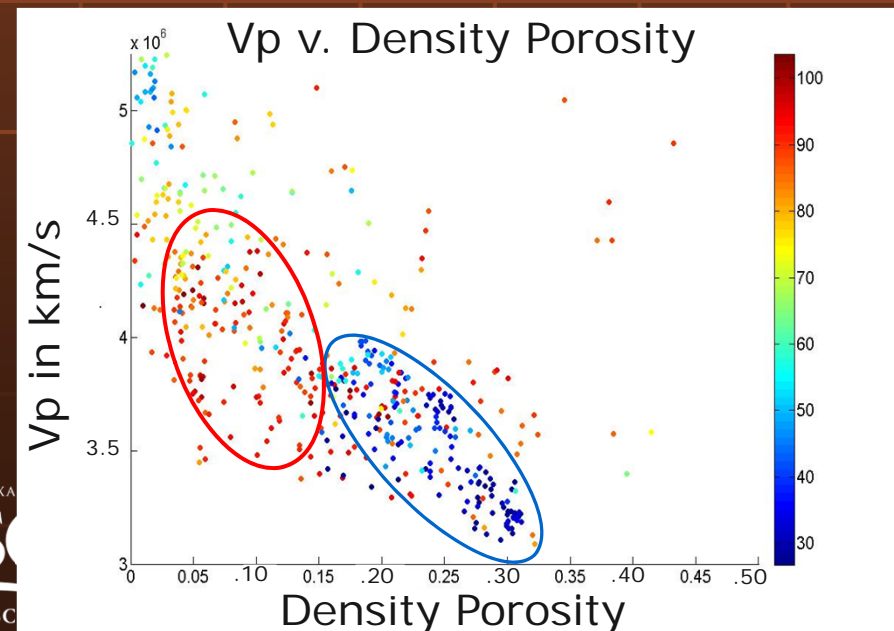
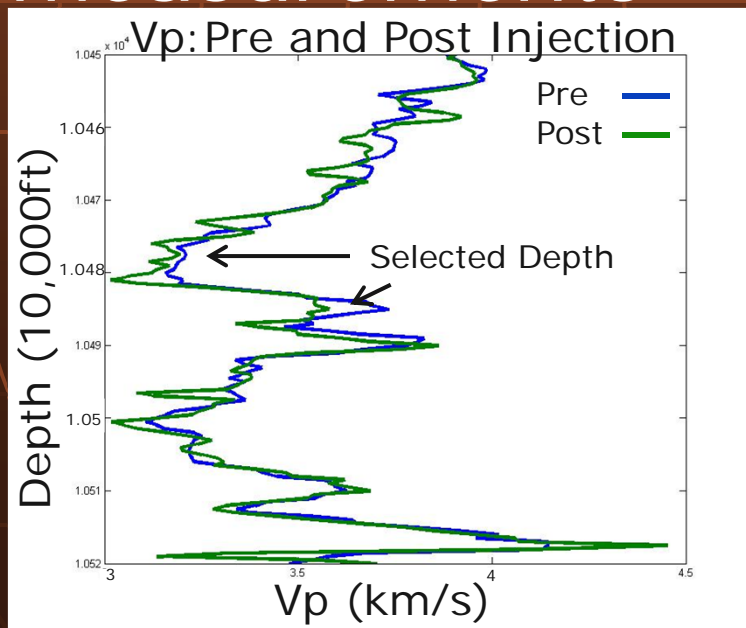
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Current Work

- Velocity Measurements and Modeling
- Establish baseline parameters for rock properties with Corey Joy
- Assessing uncertainty in well log measurements



Future Work

- Time lapse
 - Velocity modeling
 - Seismic inversion for rock properties
 - Changes in pore fluid composition
- Implications for monitoring CO₂ injection:
 - Enhanced Oil Recovery
 - Sequestration