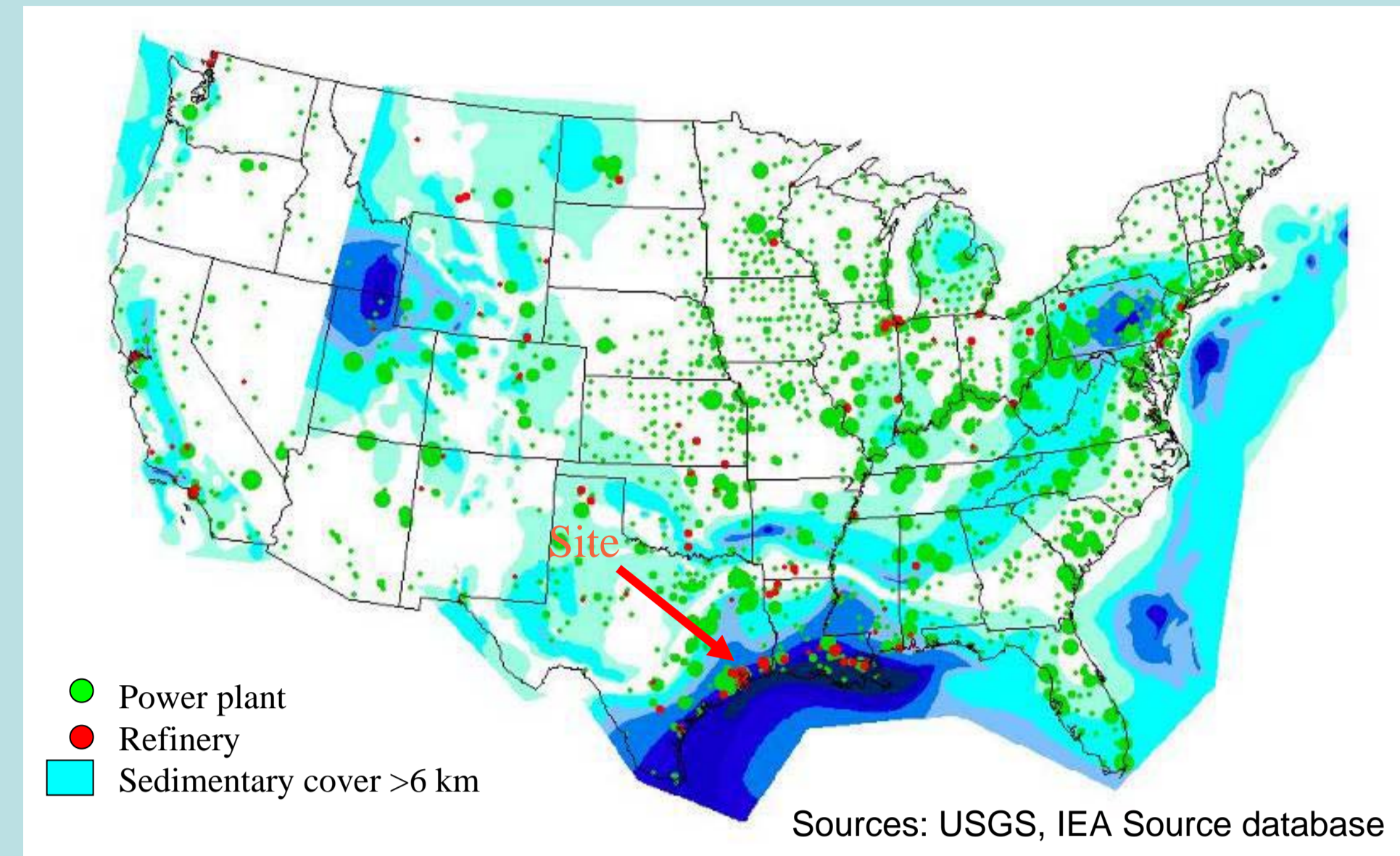


Frio Research Team

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 Lawrence Berkeley National Lab (Geo-Seq): **Larry Myer, Tom Daley, Barry Freifeld, Rob Trautz, Christine Doughty, Sally Benson, Paul Cook, Duo Wang, Ray Solbau**
 Schlumberger: **John Tombari, T. S. Ramakrishna**
 Oak Ridge National Lab: **Dave Cole, Tommy Phelps, Phil Szymcek**
 Sandia Technologies: **David Freeman, Kirk De Long, Dan Collins**
 USGS: **Yousif Kharaka, Evangelos Kakauros, Jim Thordsen, Gill Amsen**
 Praxair: **Glen Thompson**
 Australian CO2CRC (CSIRO): **Jim Underschultz**
 Core Labs: **Paul Martin and others**
 MIT **Jonathan Ajo-Franklin**



Testing a high-permeability, high-volume sandstone representative of a broad area that is an ultimate target for large-volume sequestration, Gulf of Mexico sedimentary wedge

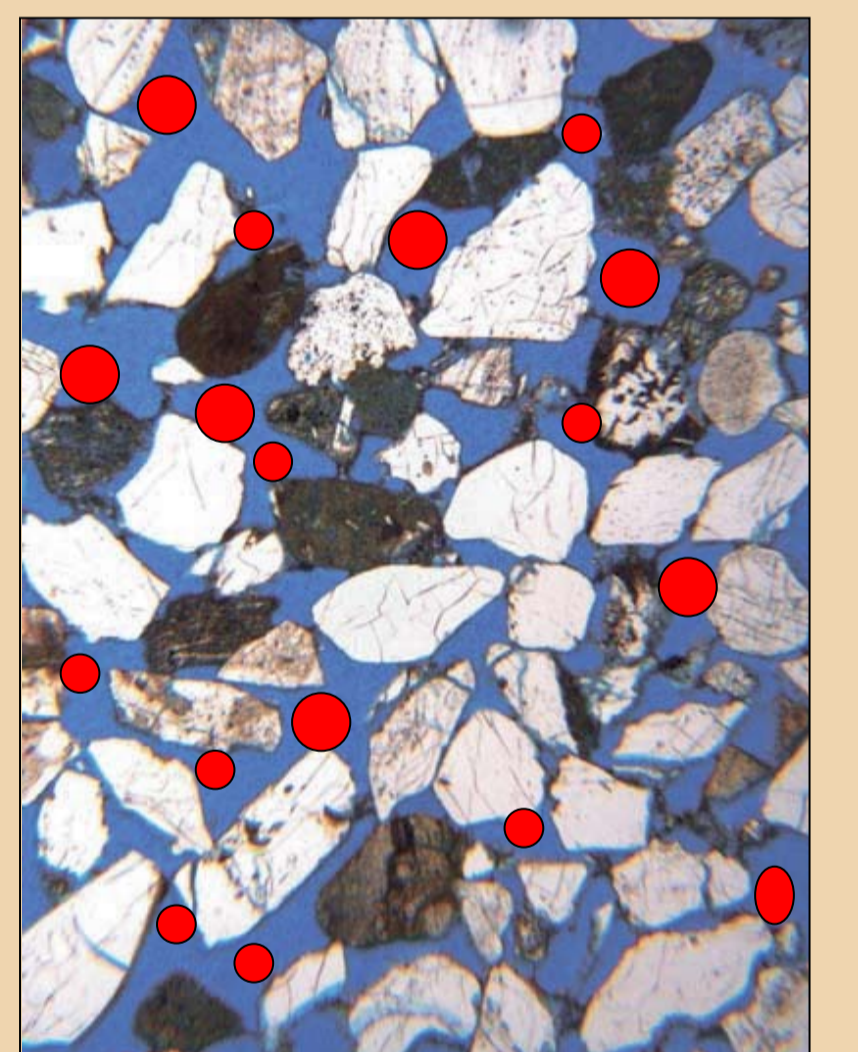
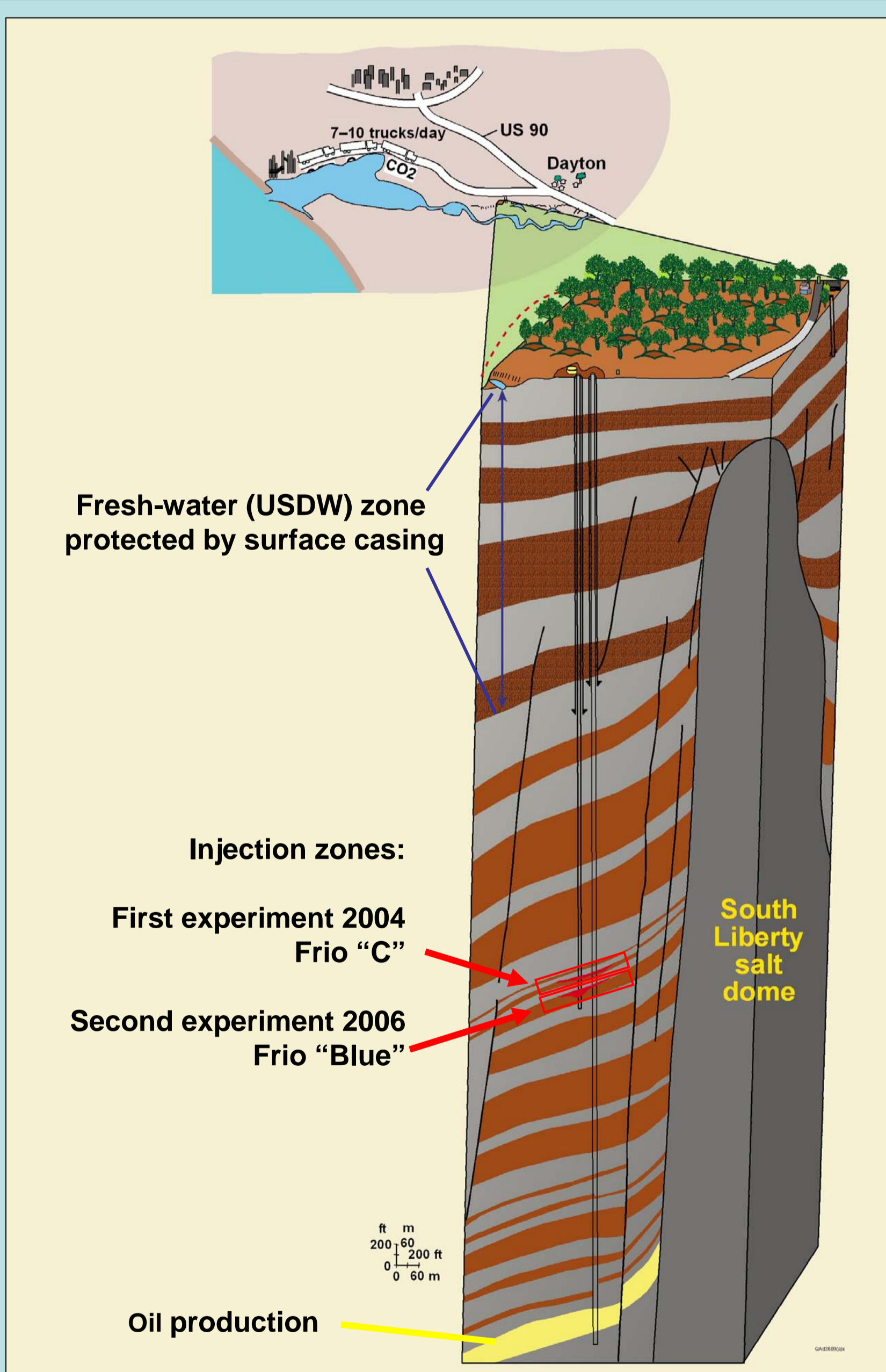
Project Goals

Frio 1 October 2004–January 2006

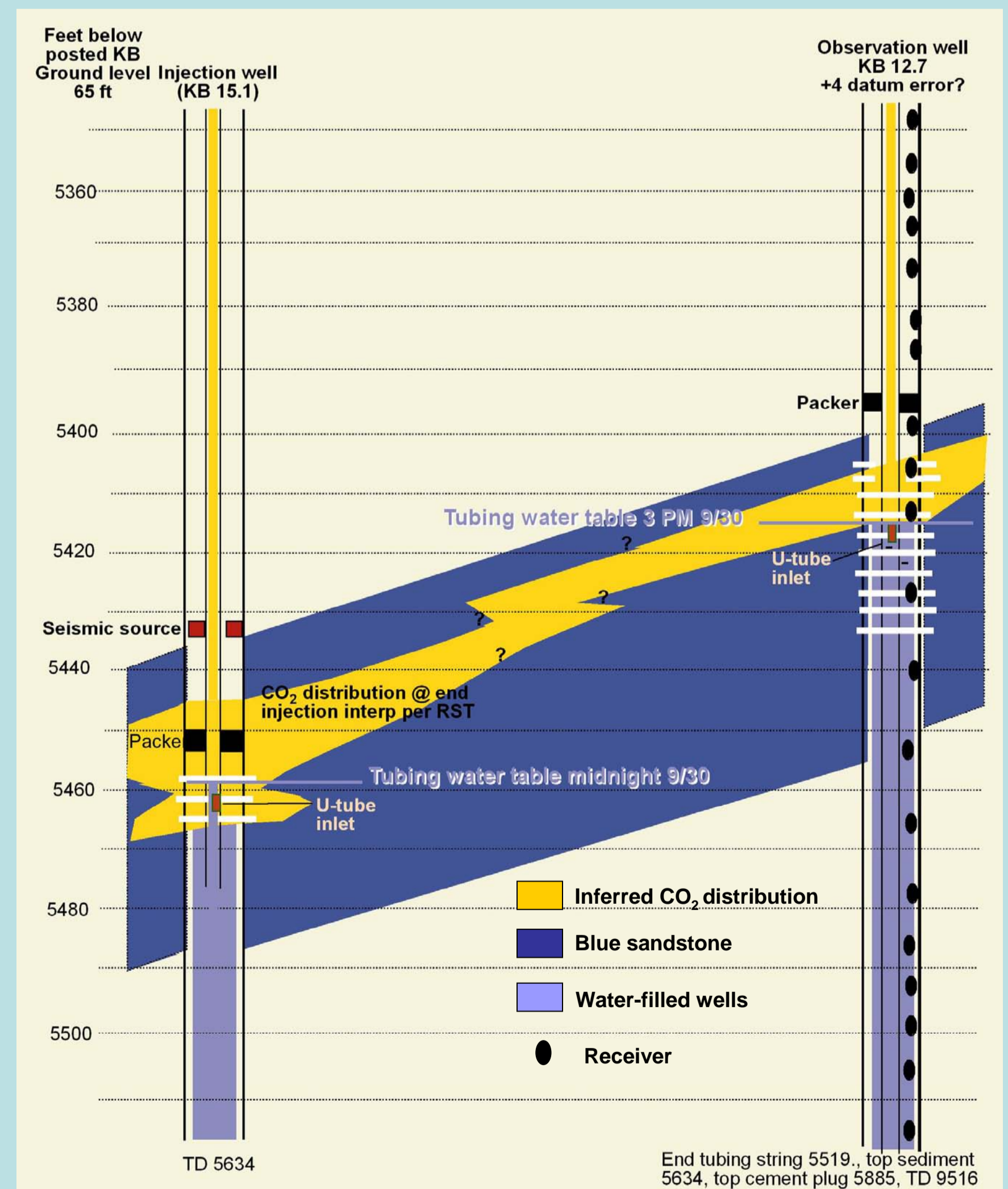
- (1) High-quality characterization prior to injection
- (2) Numerical modeling integrated with all phases of the project
- (3) Cross-comparison of multiple types of measurements
- (4) Use of wireline logs for monitoring plume movement
- (5) Data collection focused on selected azimuths
- (6) Above-zone monitoring for leakage

Frio 2 September 2006–December 2007

- Storage permanence—quantifying residual saturation and dissolution
- Postinjection monitoring under stable conditions
- Novel tool—tubing-conveyed seismic array

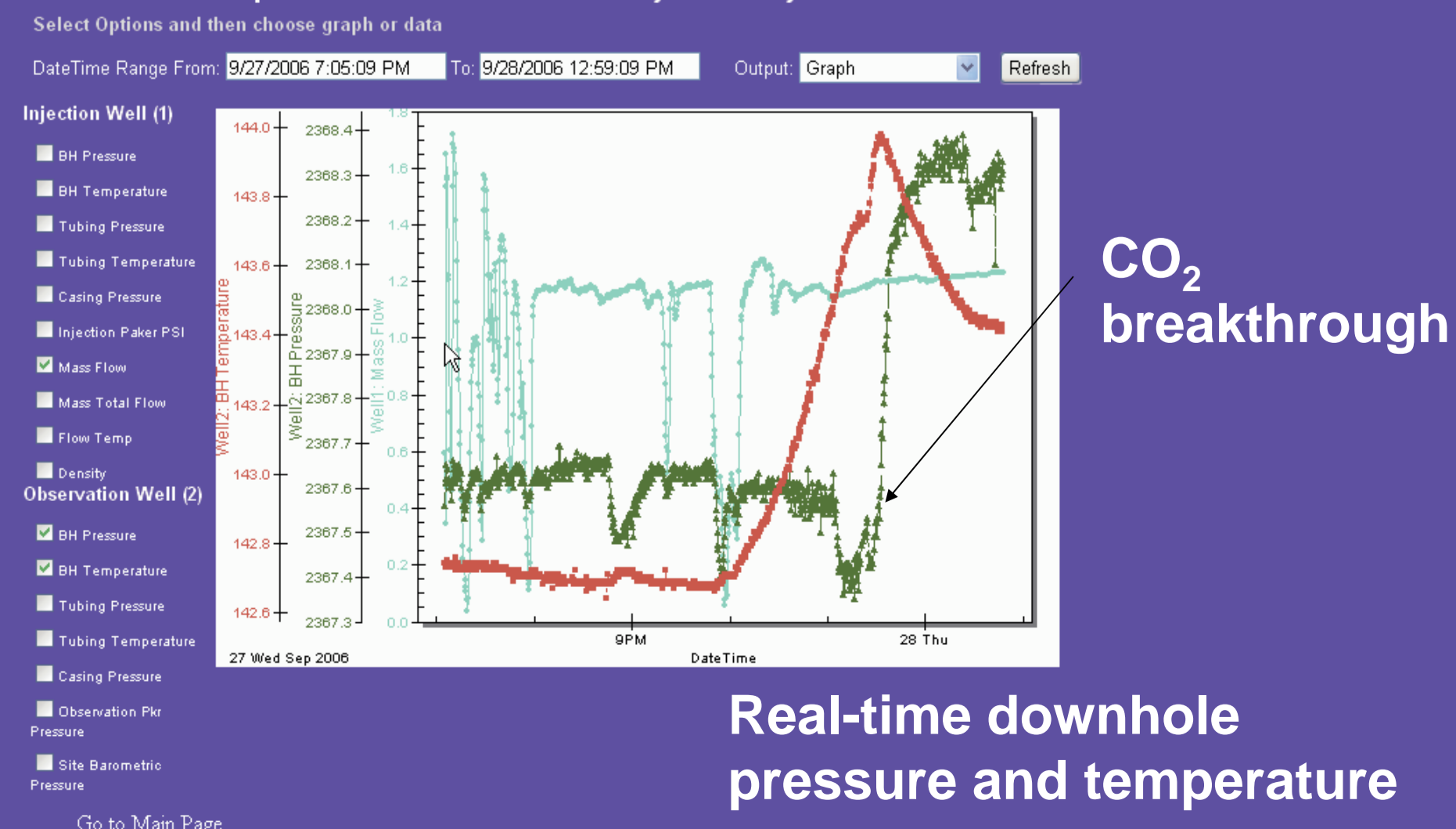


Sandstone thin-section photomicrograph, Frio Fm. Blue areas were filled with brine; now they are 10–30% filled with CO₂

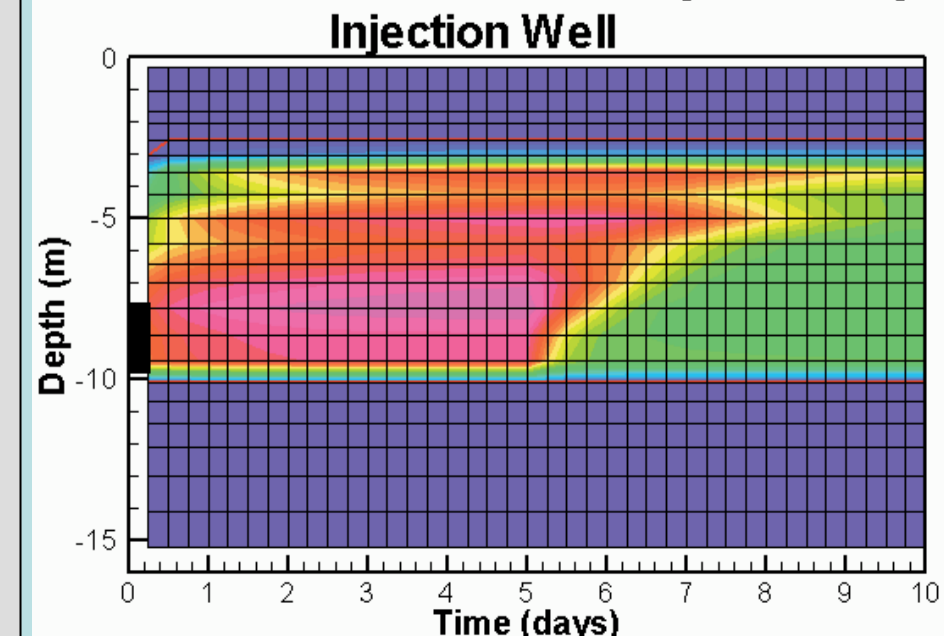


Well completion and inferred CO₂ distribution at end injection, based on RST log and crosswell seismic responses and compatible with well-production performance

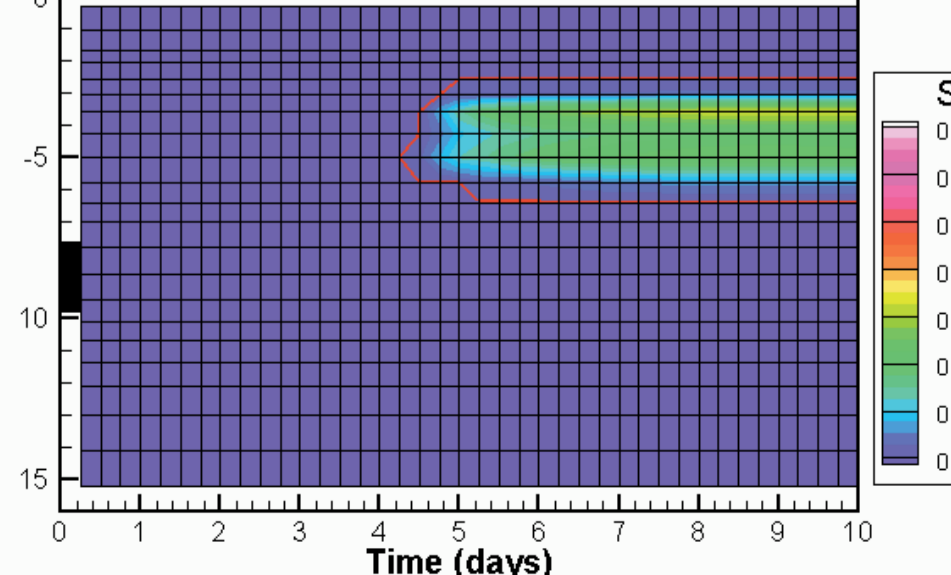
Real Time Data Acquisition - Frio Brine Pilot - CO₂ Injection Project



bs06: 100 T/day for 5 days



Observation Well



Predicted plume evolution in both wells: plume evolution and stabilization

TOUGH2 model results
 Christine Doughty
 Lawrence Berkeley National Lab