

SOUTHEAST OFFSHORE STORAGE RESOURCE ASSESSMENT (SOSRA)

PROJECT NUMBER: DE-FE0026086

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U.S. DEPARTMENT OF
ENERGY



NATIONAL
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VirginiaTech



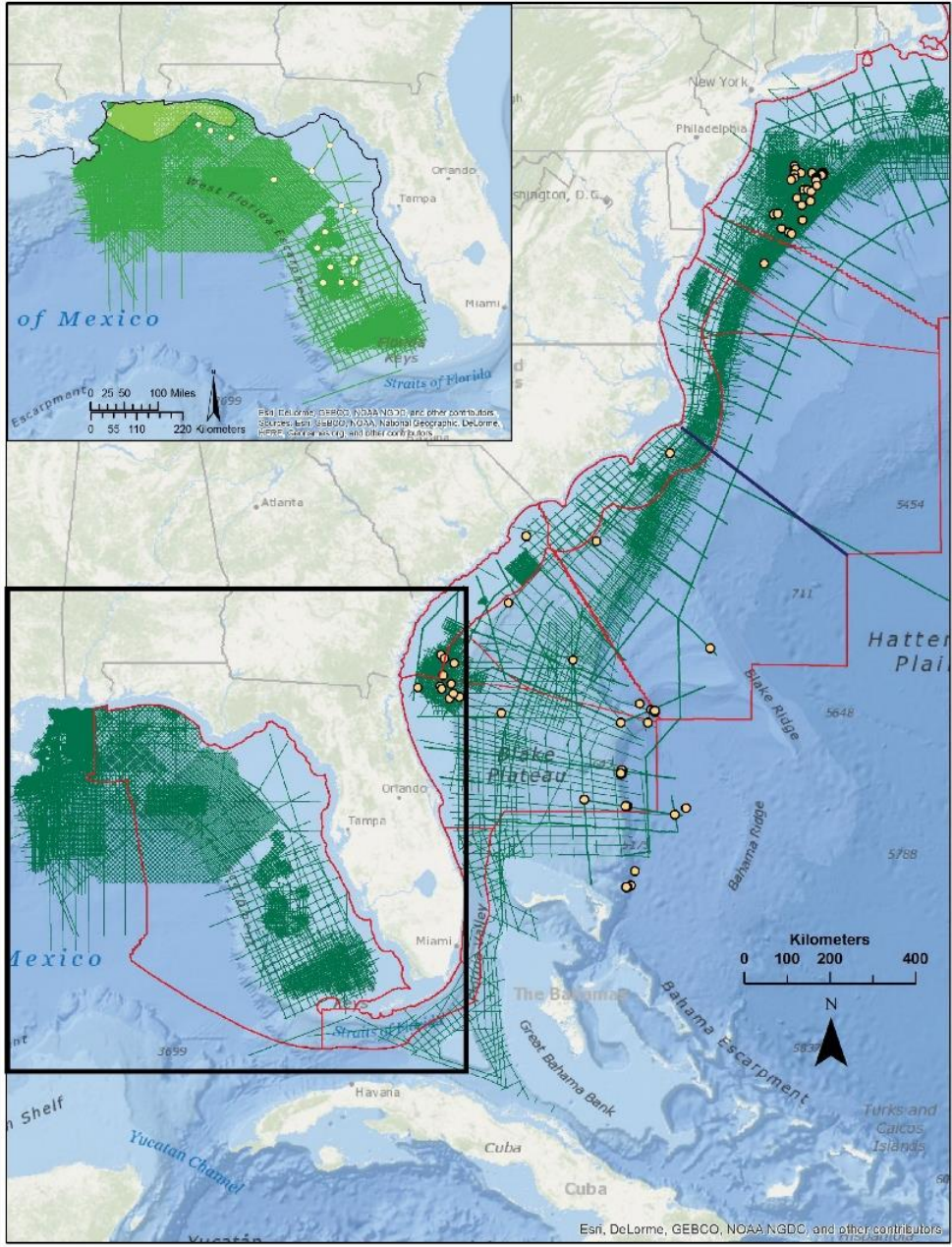
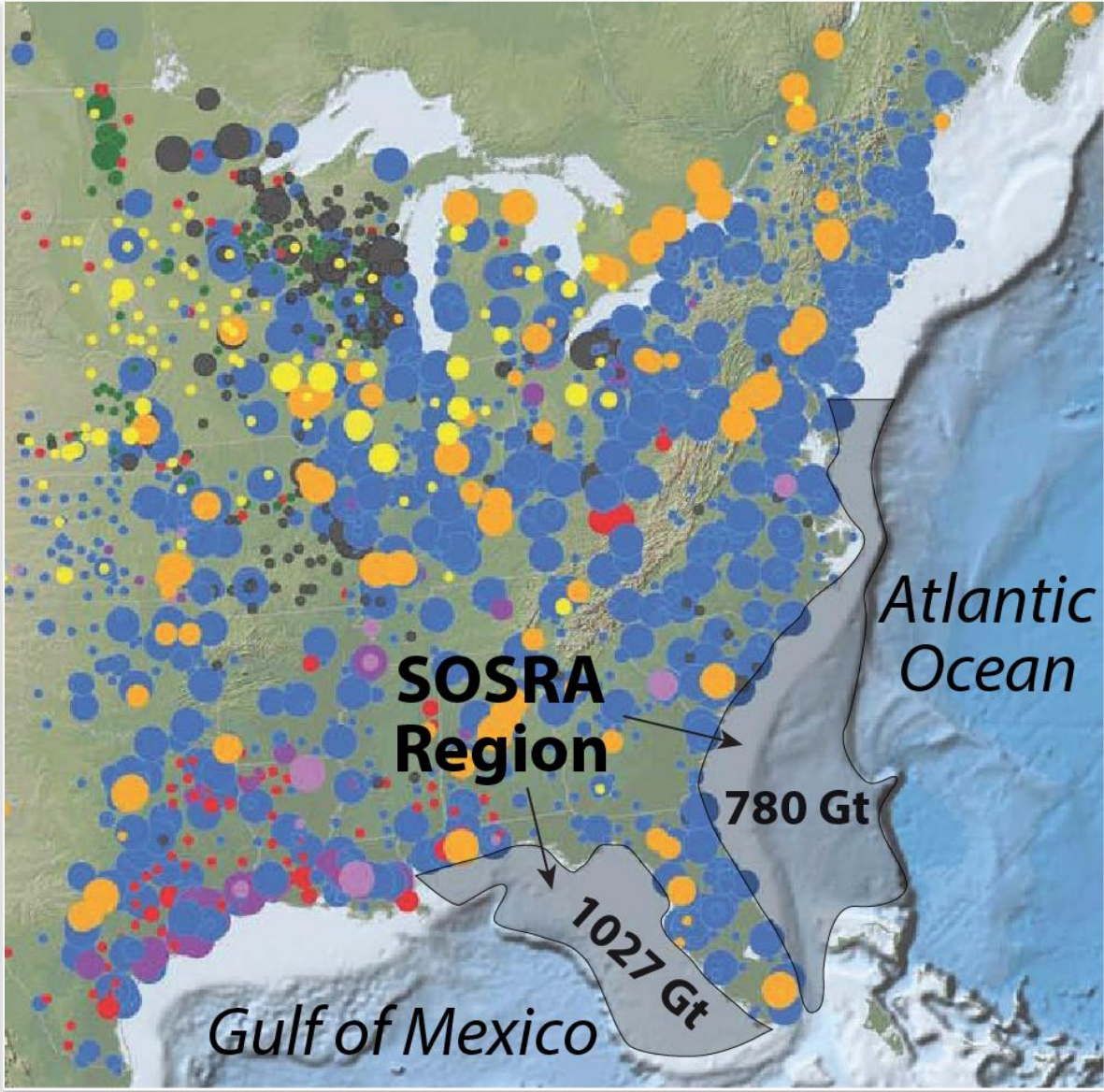
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Cost share and research support are provided by the Project Partners and an Advisory Committee.*

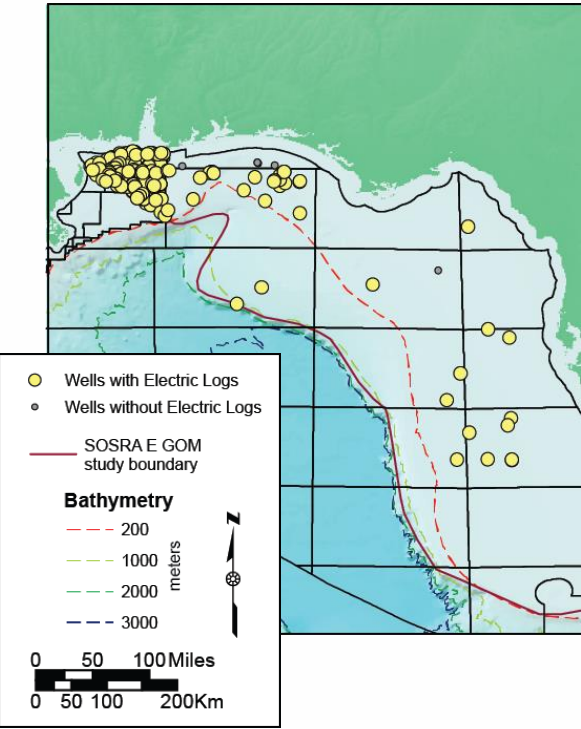
GOMCarb-SECARB Offshore Partnership Meeting
Beaumont, TX
February 10-12, 2019

SOSRA PROJECT AREA

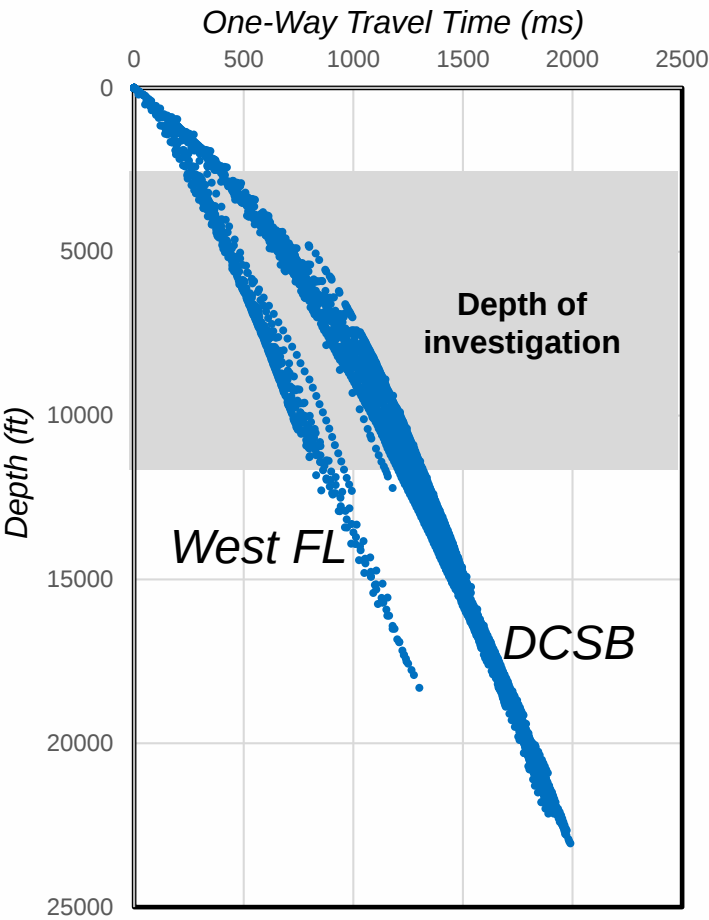


WORKFLOWS: DATA ACQUISITION, ANALYSIS

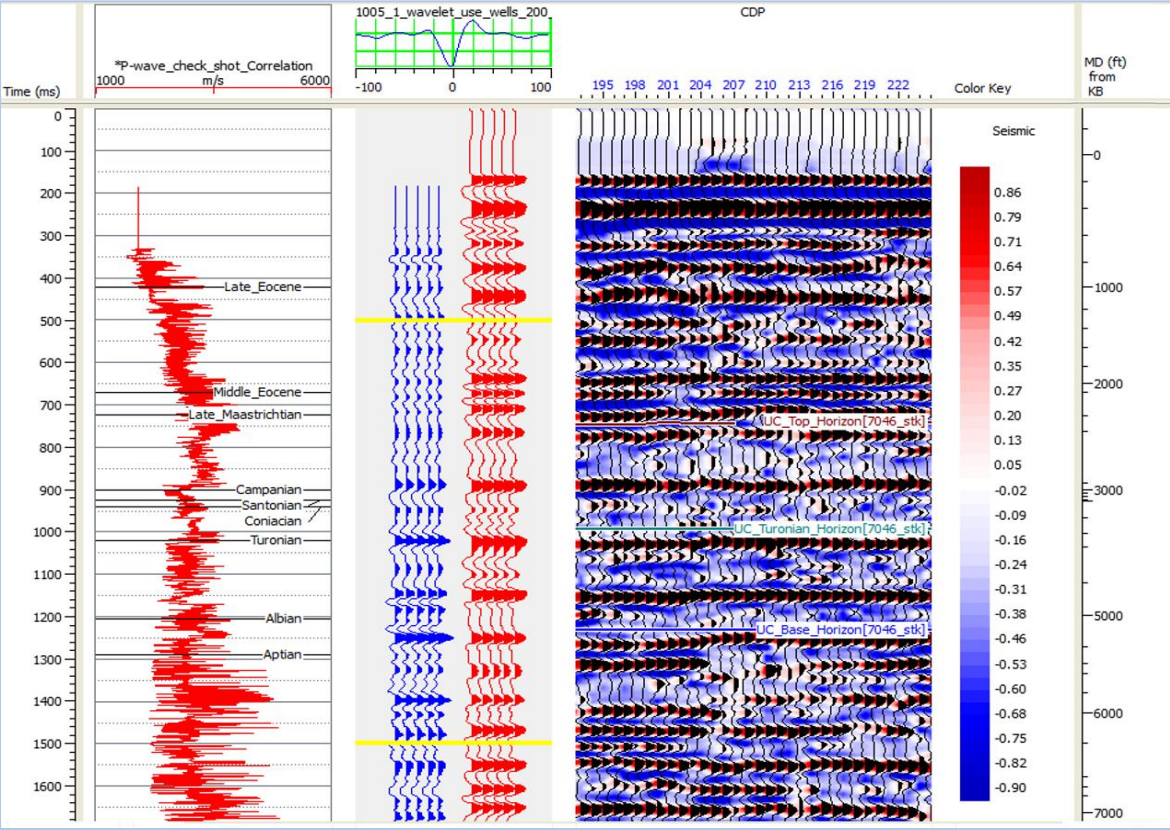
Well and log identification, EGOM



Velocity Surveys, EGOM

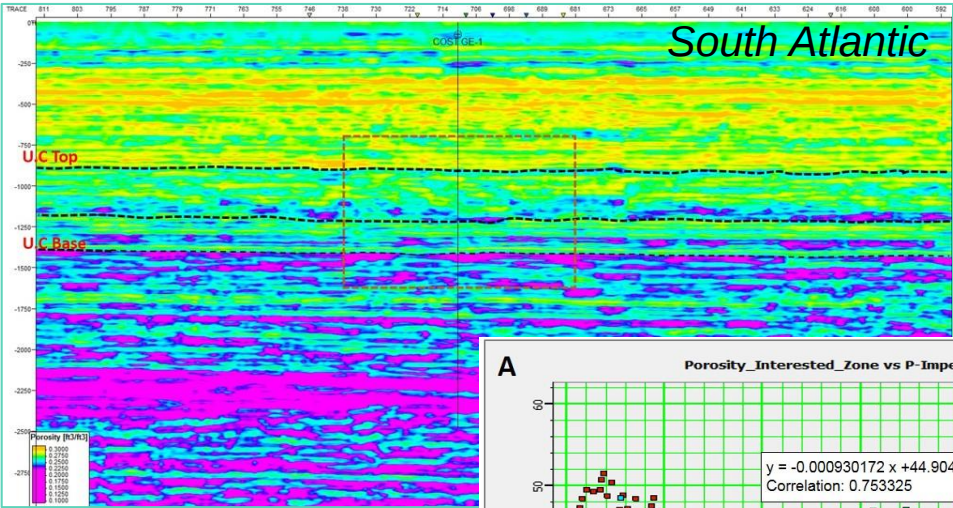


Seismic-well tie, Southern Atlantic

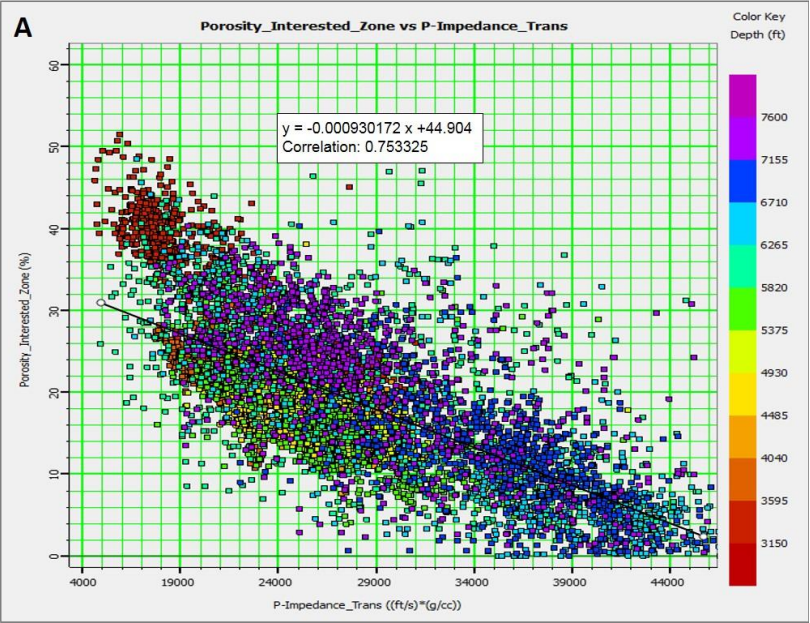


WORKFLOWS: INTERPRETATION, MAPPING

Seismic interpretation, inversion



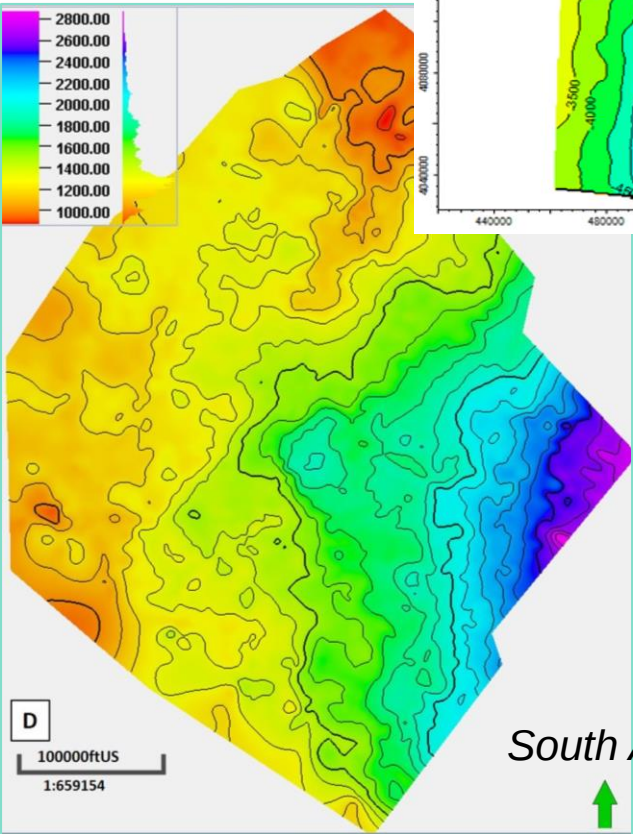
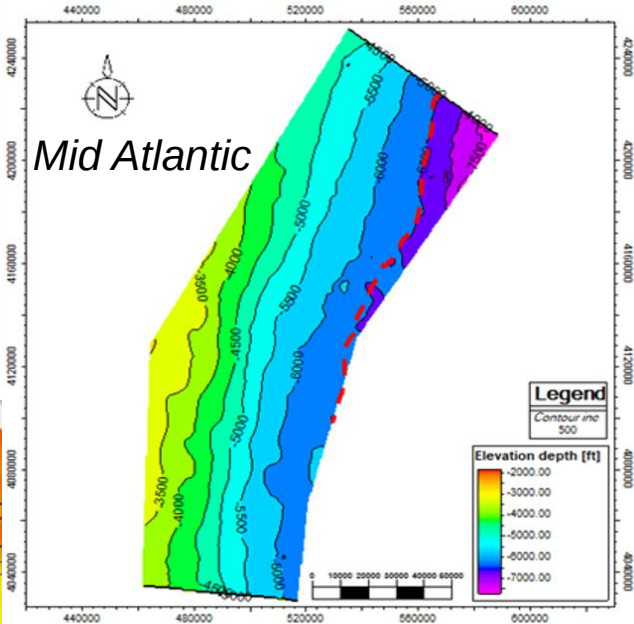
Well log analysis



Impedance vs. porosity

Mapping

- Time/depth structure
- Isochron
- Gross/net reservoir
- Seal thickness
- Porosity
- Storage Resource

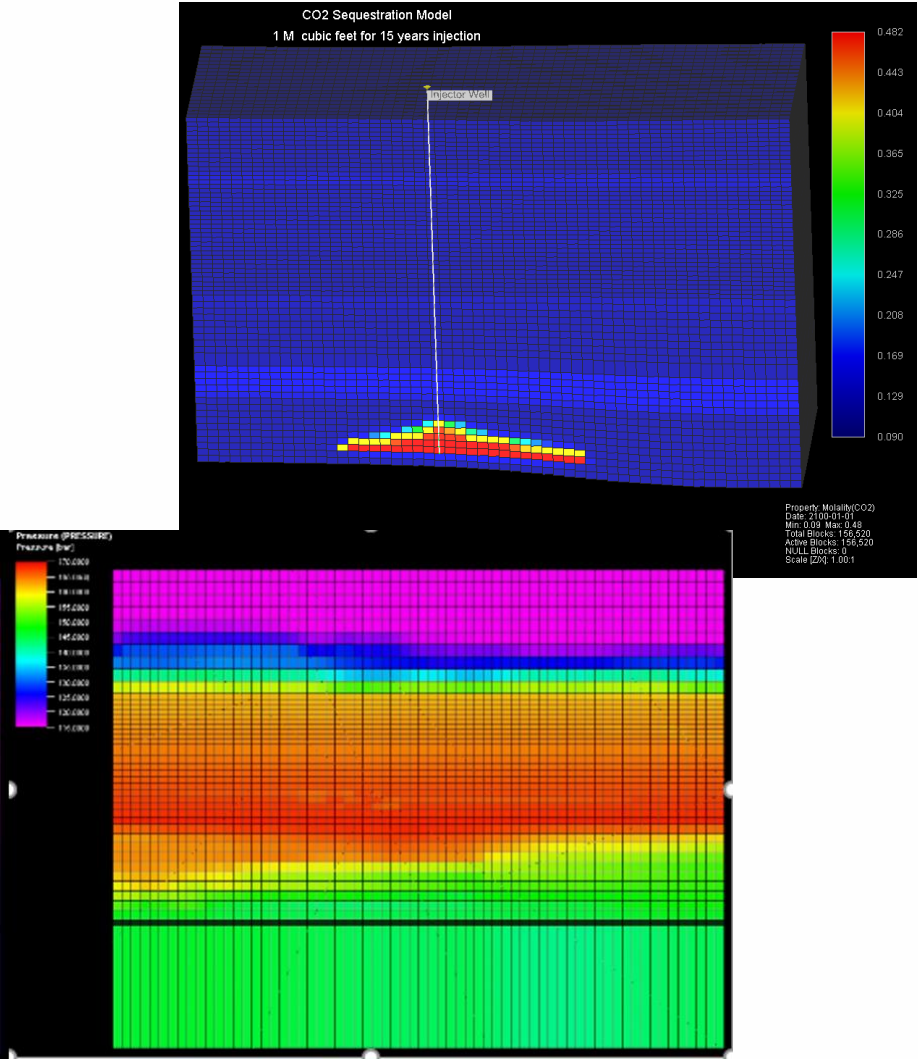
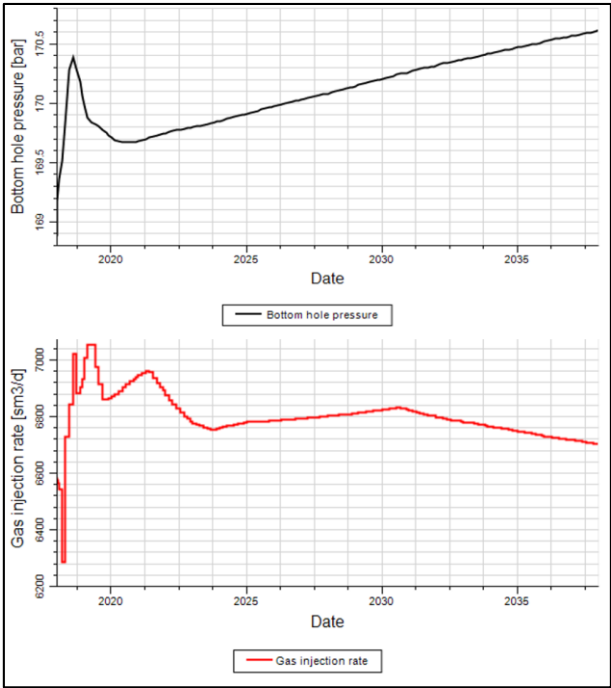


Structure maps

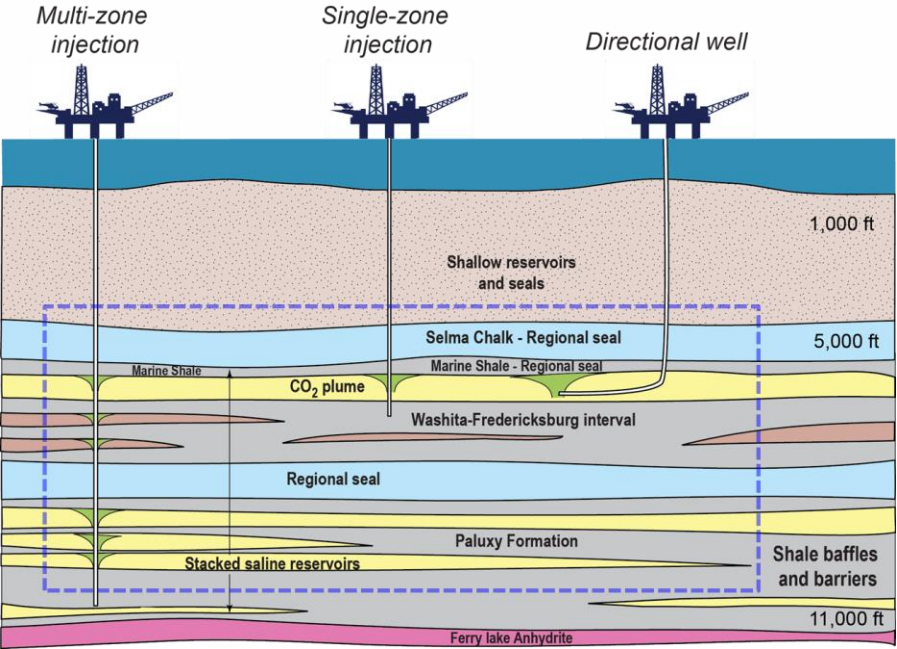
WORKFLOWS: MODELING

Plume and pressure footprint

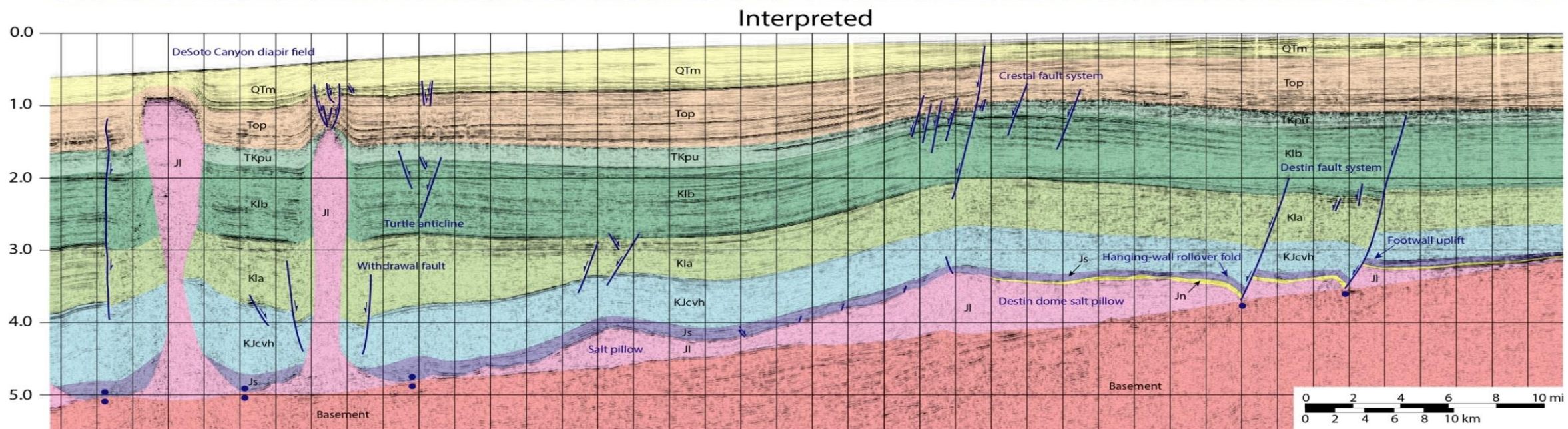
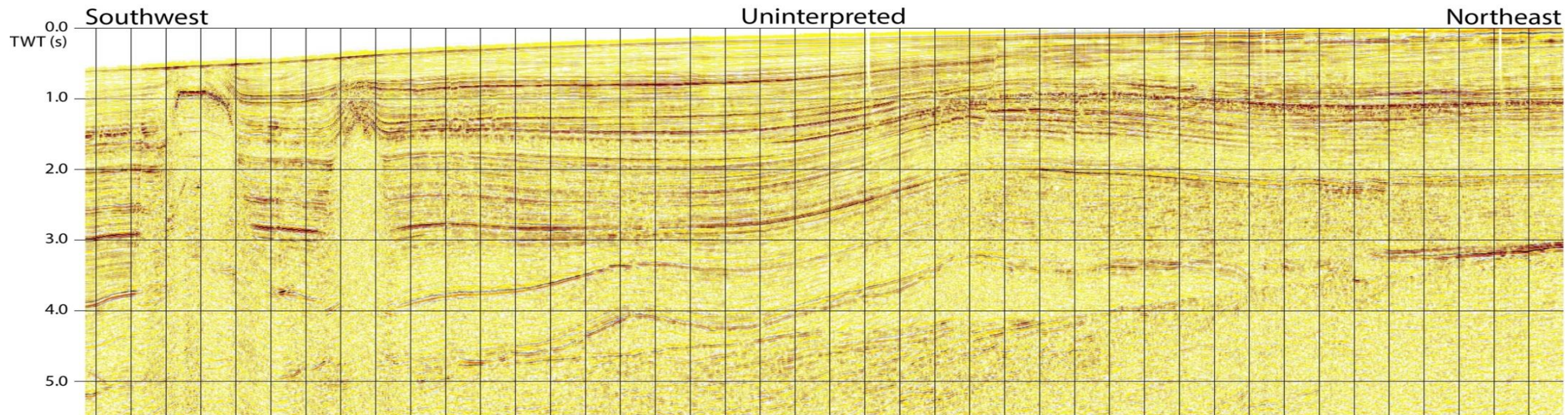
Bottom-hole pressure



Development strategies



DCSB DESTIN DOME



Top Ferry Lake Anhydrite

Destin dome

Desoto Canyon diapir field

Viosca Knoll diapir

Shelf margin

Top Cotton Valley Group

Top Haynesville Fm.

Base Smackover Fm.

Destin fault system

Top Lower Cretaceous A

Time (s)
Top Lower Cretaceous A

175 mi (280 km)

0

7 s (tw)

1

2

3

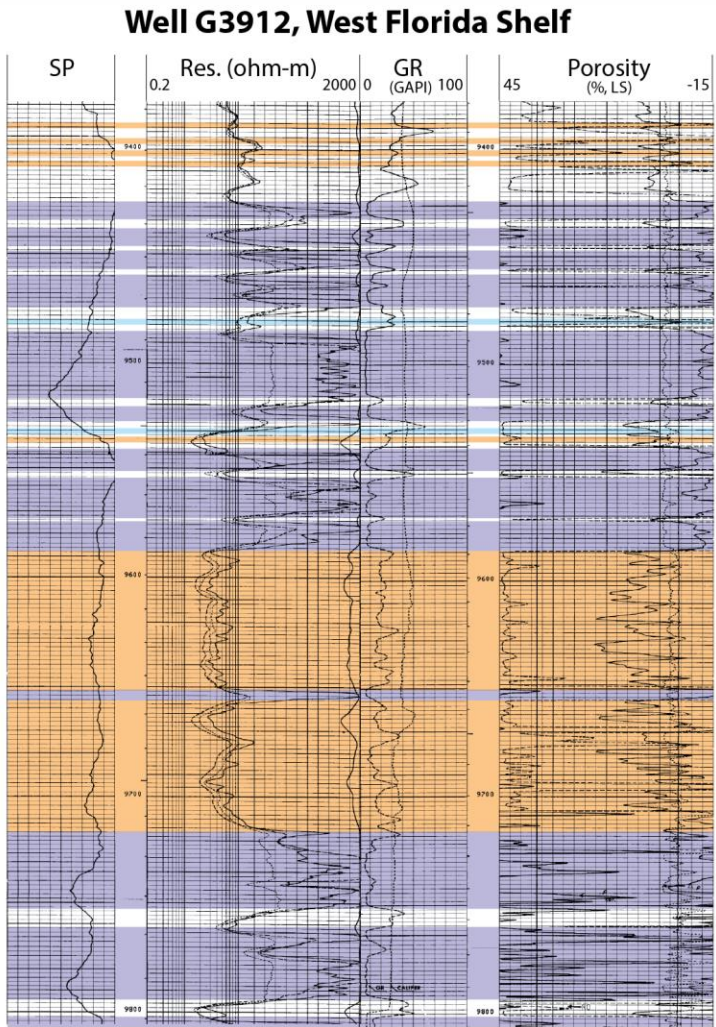
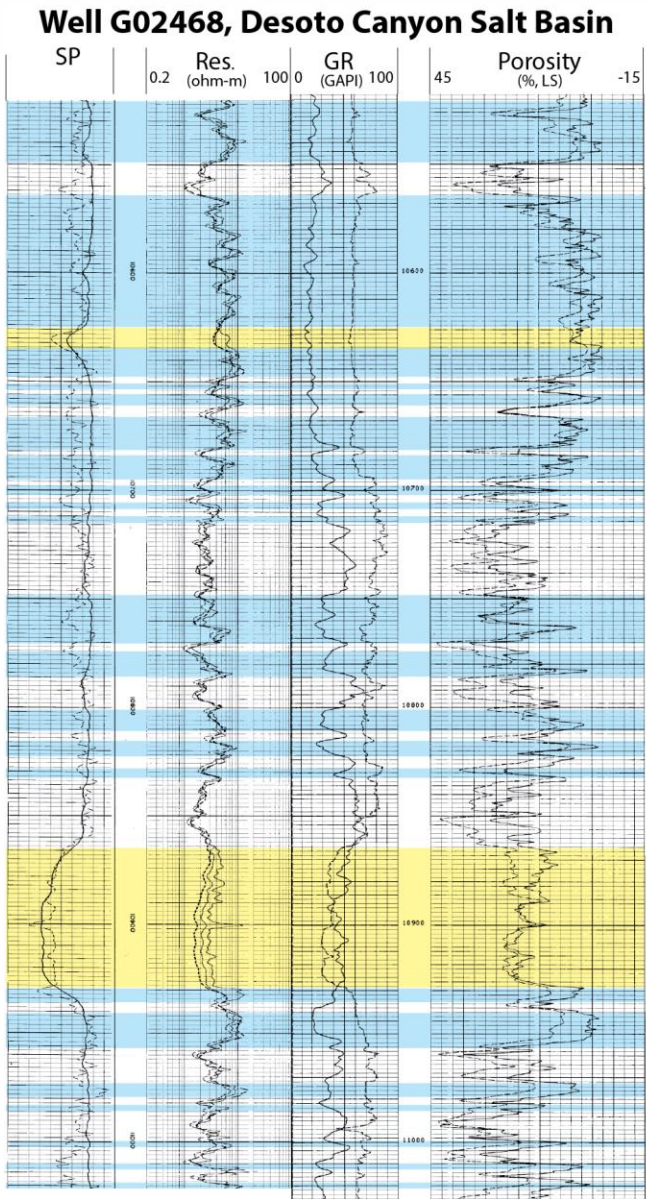
4

5

6 s

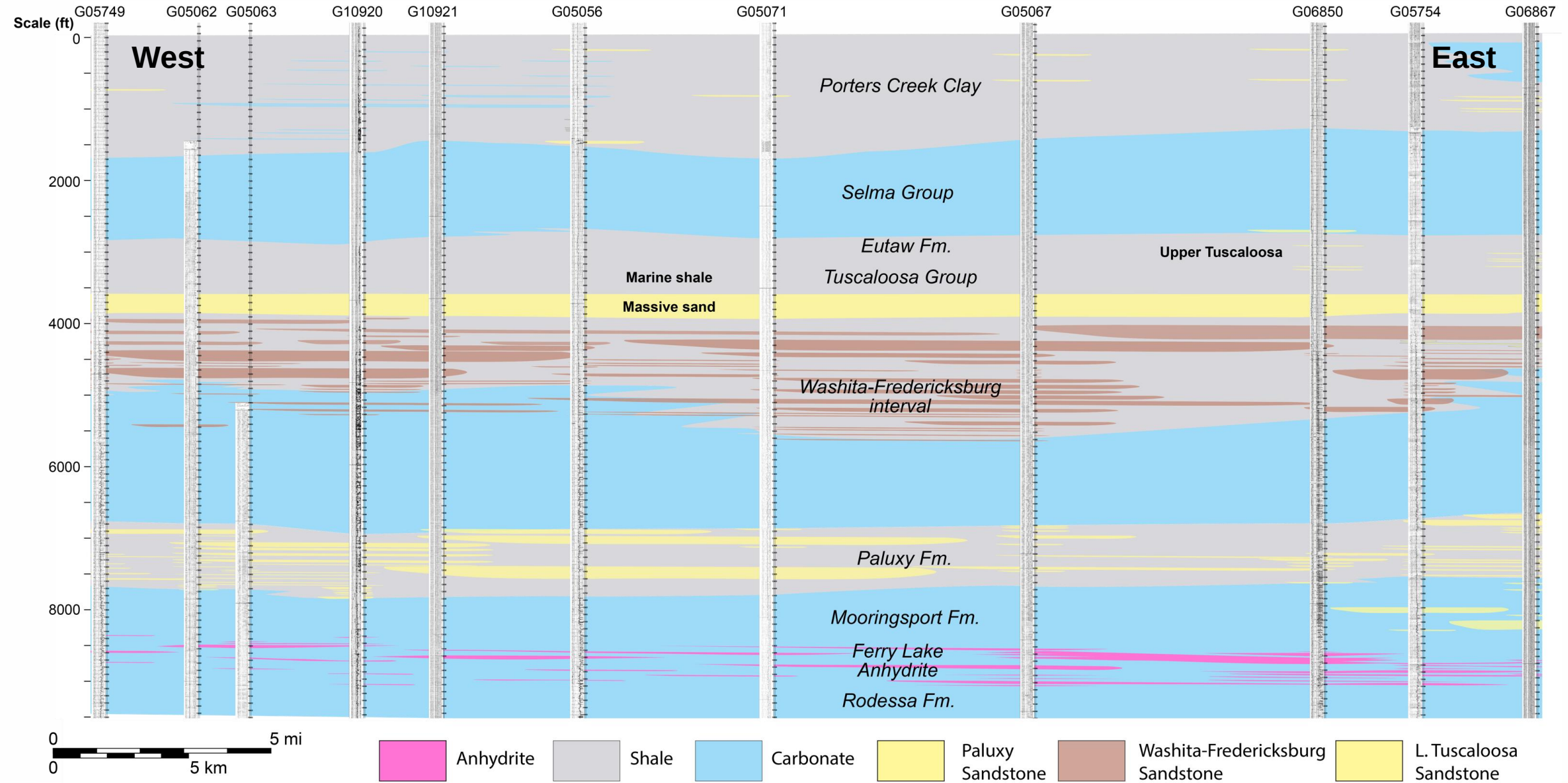


PROSPECTIVE EGOM SINKS

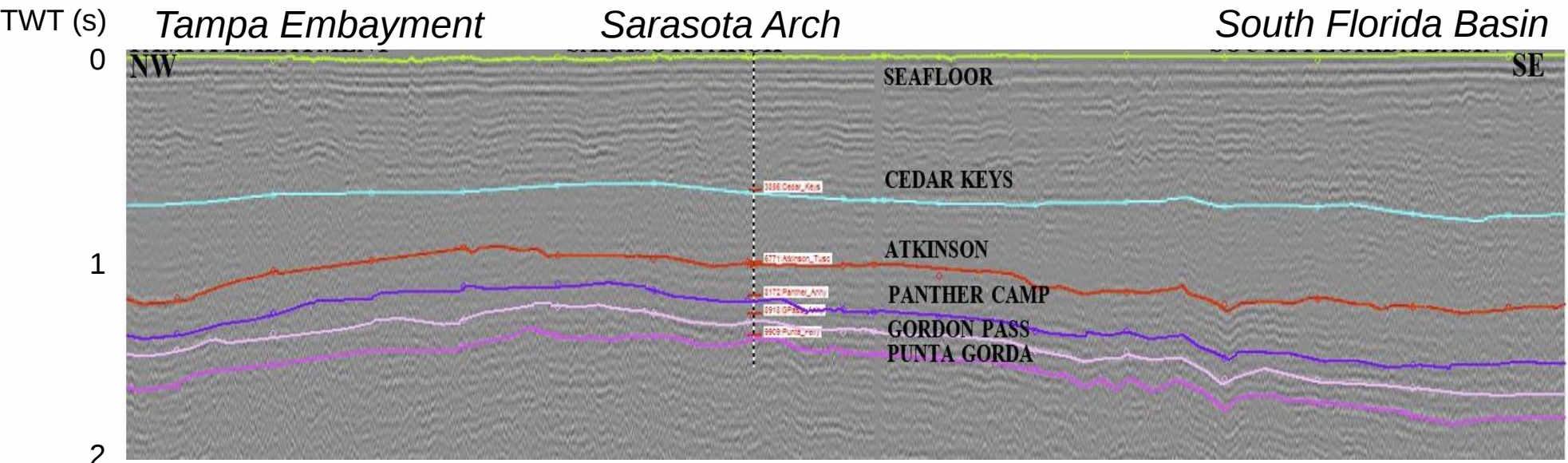


Shale Sandstone Limestone Dolomite Anhydrite

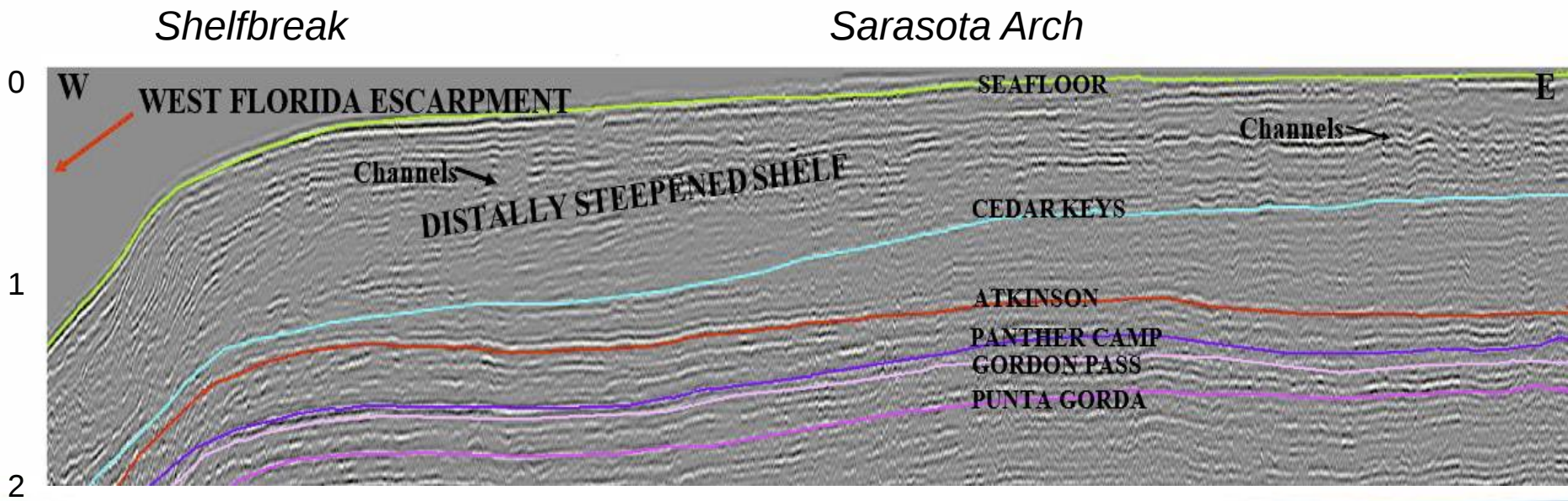
STRATIGRAPHIC CROSS-SECTION, CRETACEOUS, MOBILE AREA



WEST FLORIDA SHELF SEISMIC PROFILES

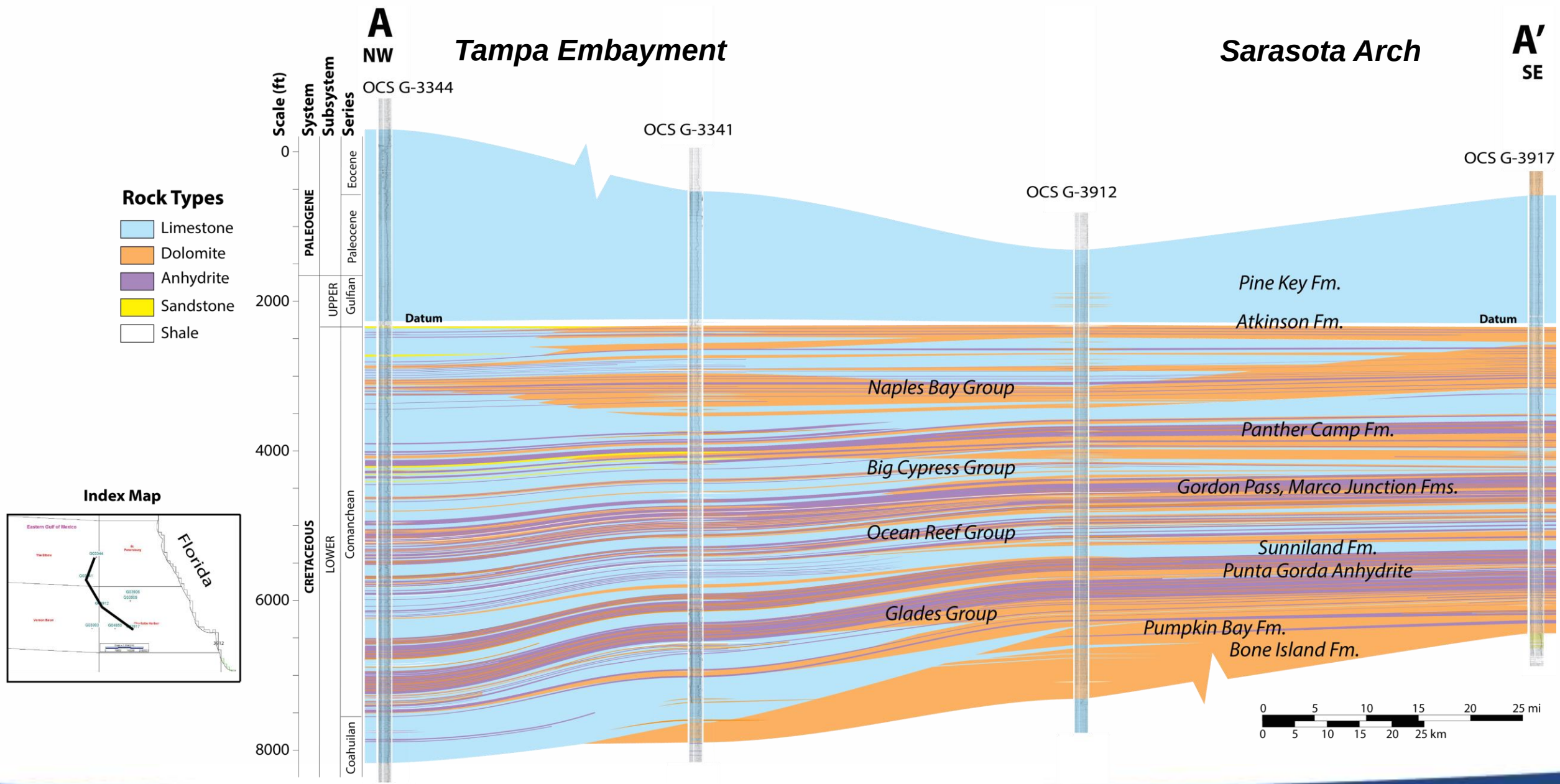


Strike profile



Dip profile

WEST FLORIDA SHELF STRATIGRAPHIC CROSS-SECTION



VOLUMETRIC ASSESSMENT, DeSOTO CANYON INTEREST AREA

$$G_{CO_2} = A_t h_g \phi_{tot} \rho E_{saline}$$

Where,

A_t is the reservoir area

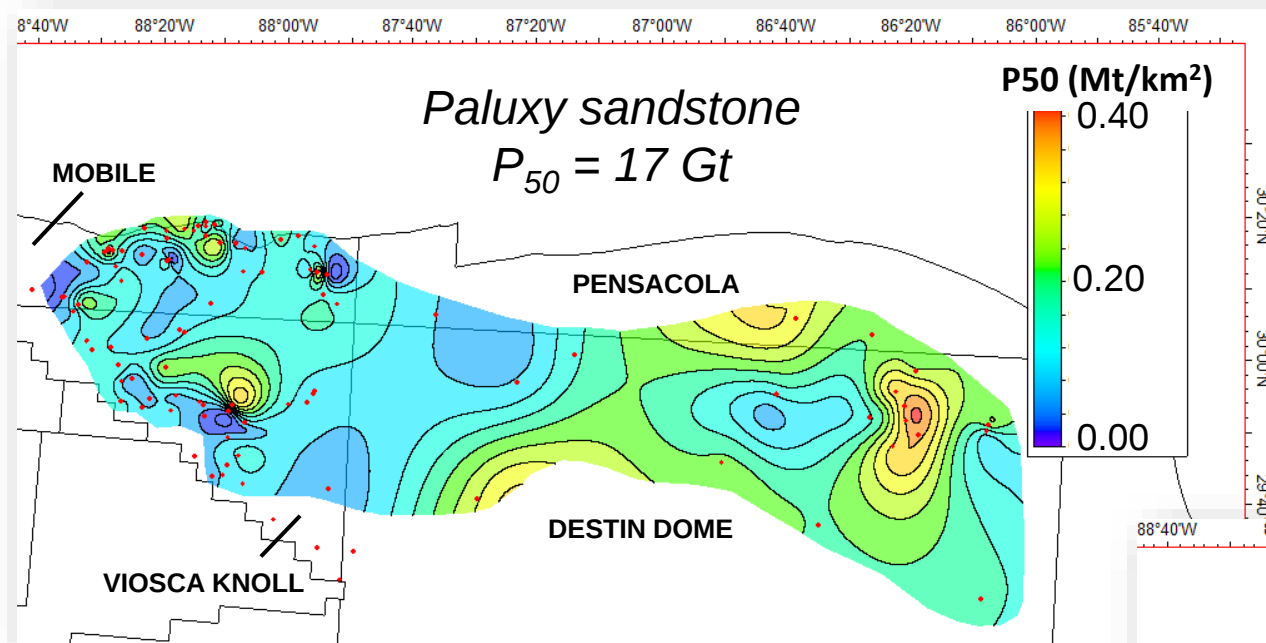
h_g is the gross formation thickness

ϕ_{tot} is the net formation thickness

ρ is the CO₂ density

E_{saline} is the CO₂ storage efficiency factor

Paluxy + Lower Tuscaloosa
 $P_{50} = 3.6 \text{ Gt}$

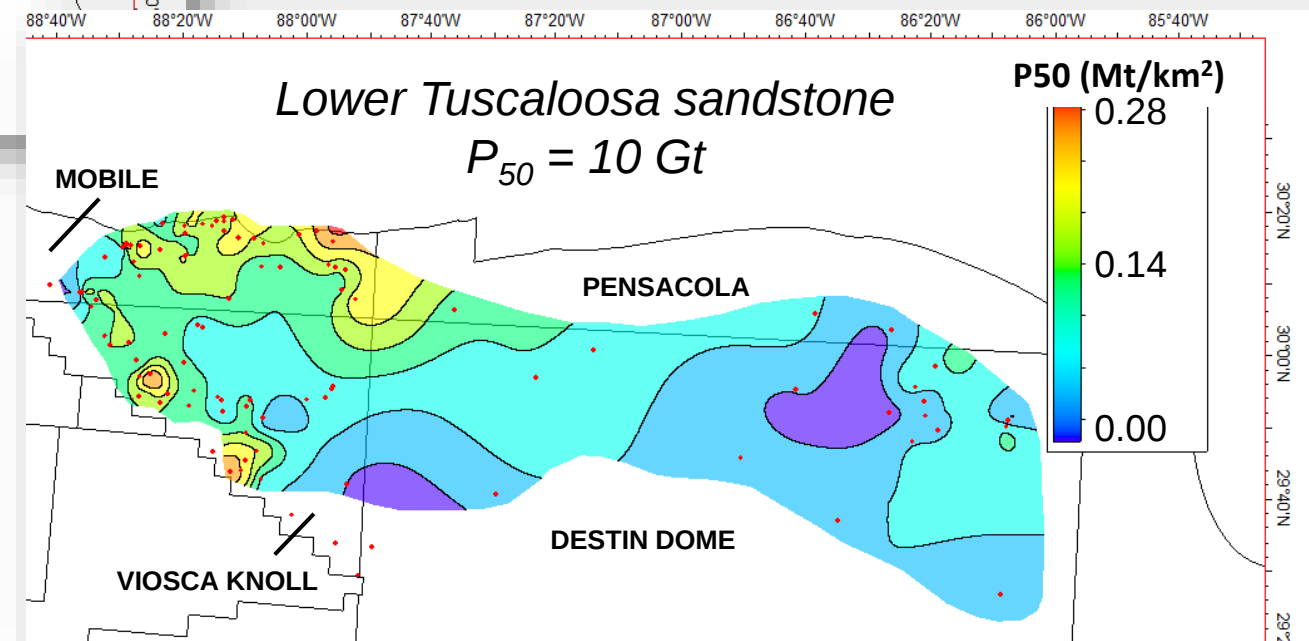


$$E_{P10} = 7.4\%$$

$$E_{P50} = 14.0\%$$

$$E_{P90} = 24.0\%$$

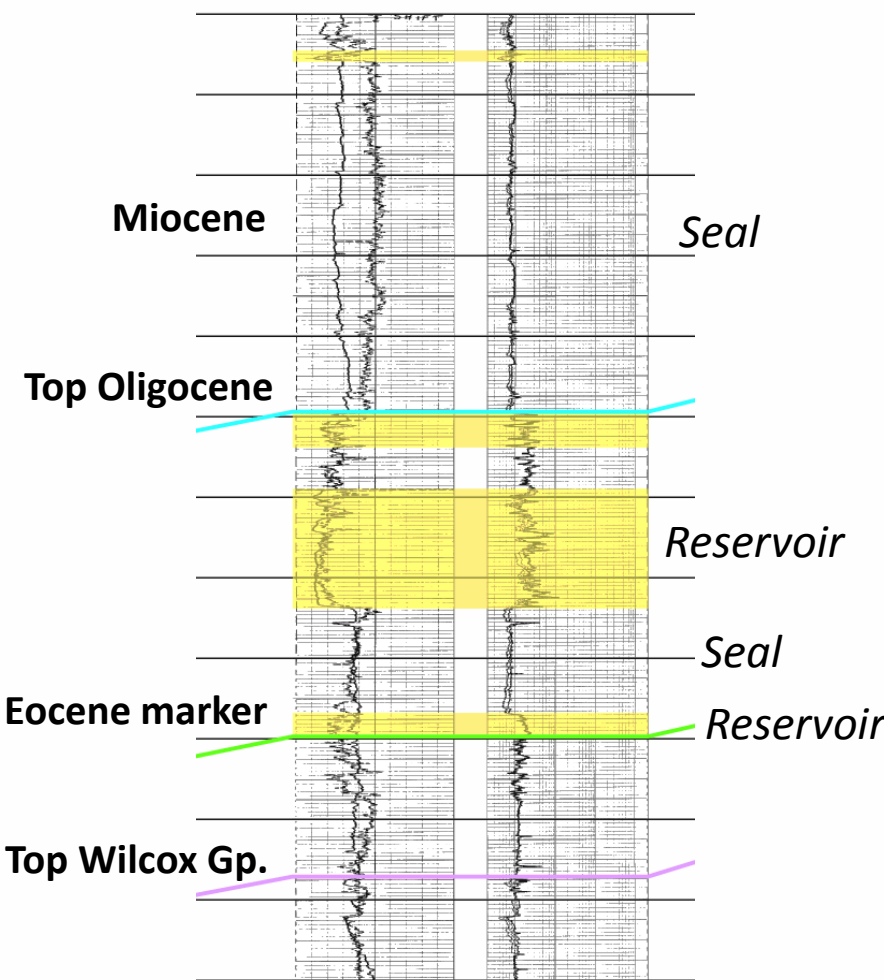
Porosity cutoff = 15%



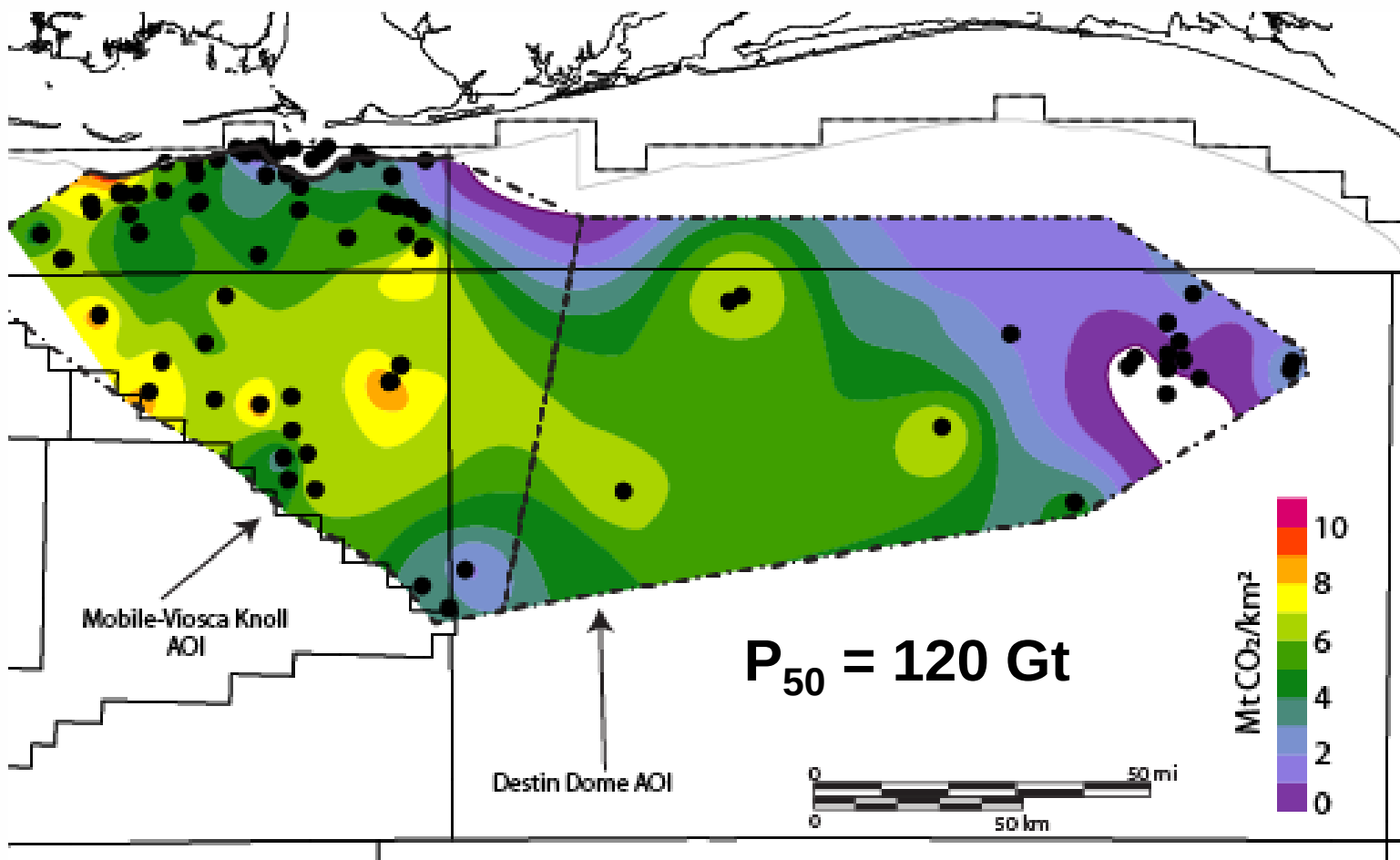
PALEOGENE-NEOGENE RESERVOIRS, DESOTO CANYON SALT BASIN

Gamma-SP-Resistivity Logs

608154001600



Storage Resource



OBSERVATIONS

- Large portfolio of potential sinks and seals in eastern Gulf of Mexico region.
- Main storage prospects in Cretaceous-Miocene section.
- Multiple sandstone formations prospective in DeSoto Canyon Salt Basin; abundant mudrock and carbonate seals, including chalk.
- Porosity of sandstone commonly > 20%.
- Relatively simple Cretaceous carbonate platform in West Florida.
- Widespread anhydrite seals; porous dolomite abundant on Sarasota Arch.
- Porosity of dolomite in places > 15%.
- Preliminary assessment of Paluxy and Tuscaloosa sandstone in northern DeSoto Canyon Salt Basin indicates ~3.6 Gt storage capacity at P_{50} .