Usability of Historical Seismic Data in Surface Sediment Resource Evaluation

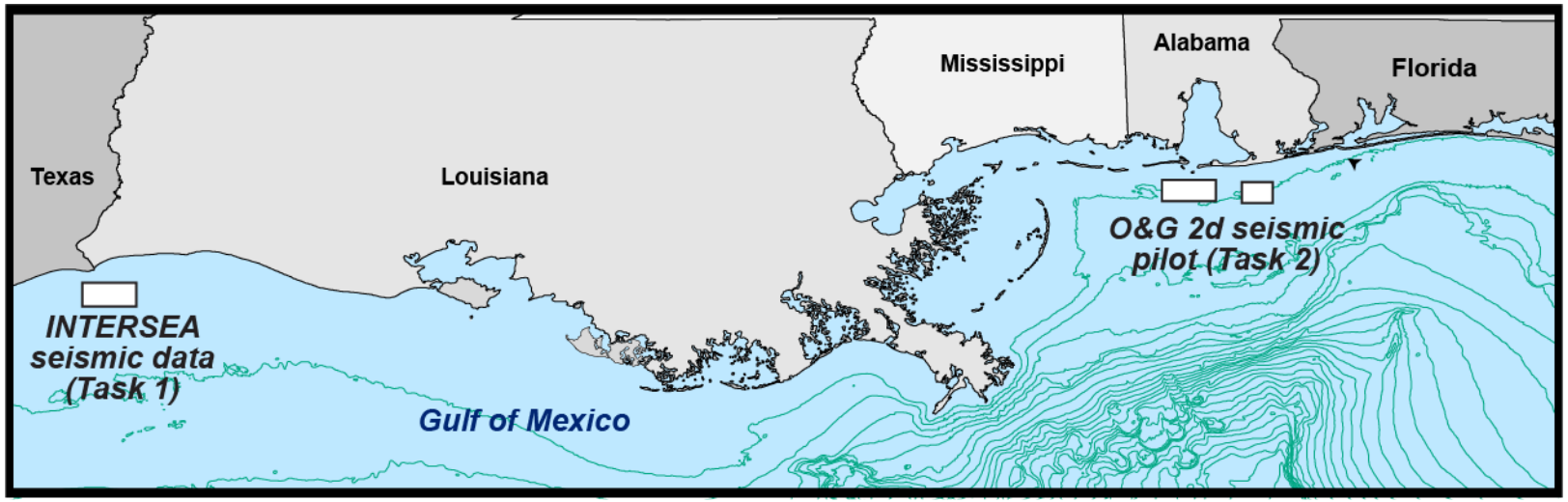
Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf

Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf for use in Near-Surface Assessment of the Geologic Framework and Potential

James Flocks, United States Geological Survey (USGS)

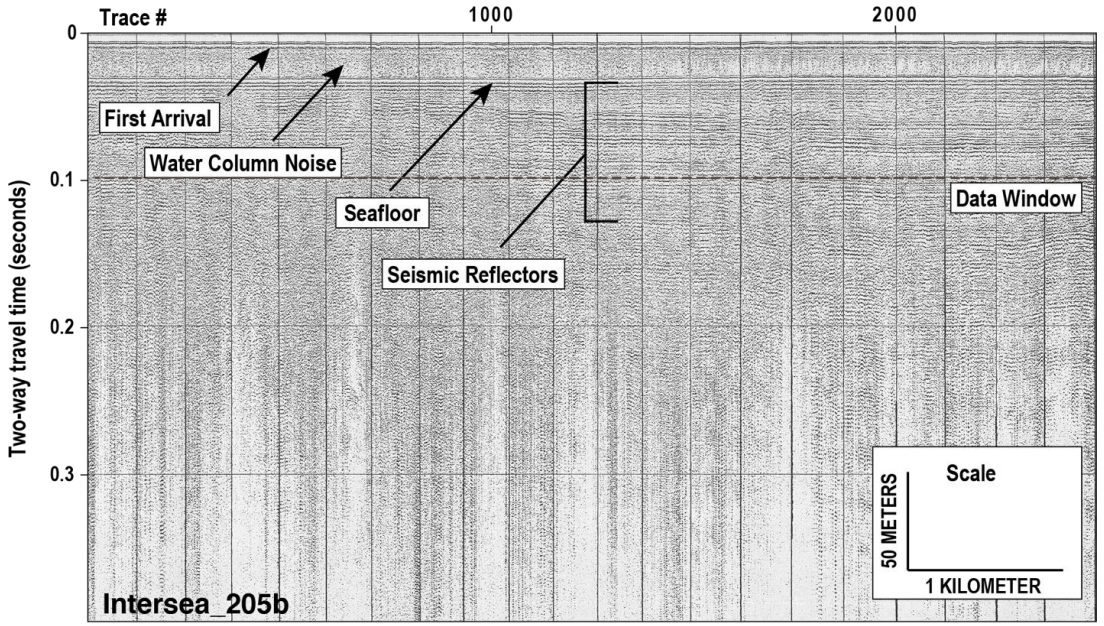
USGS science for a changing world

BOEM Bureau of Ocean Energy Management



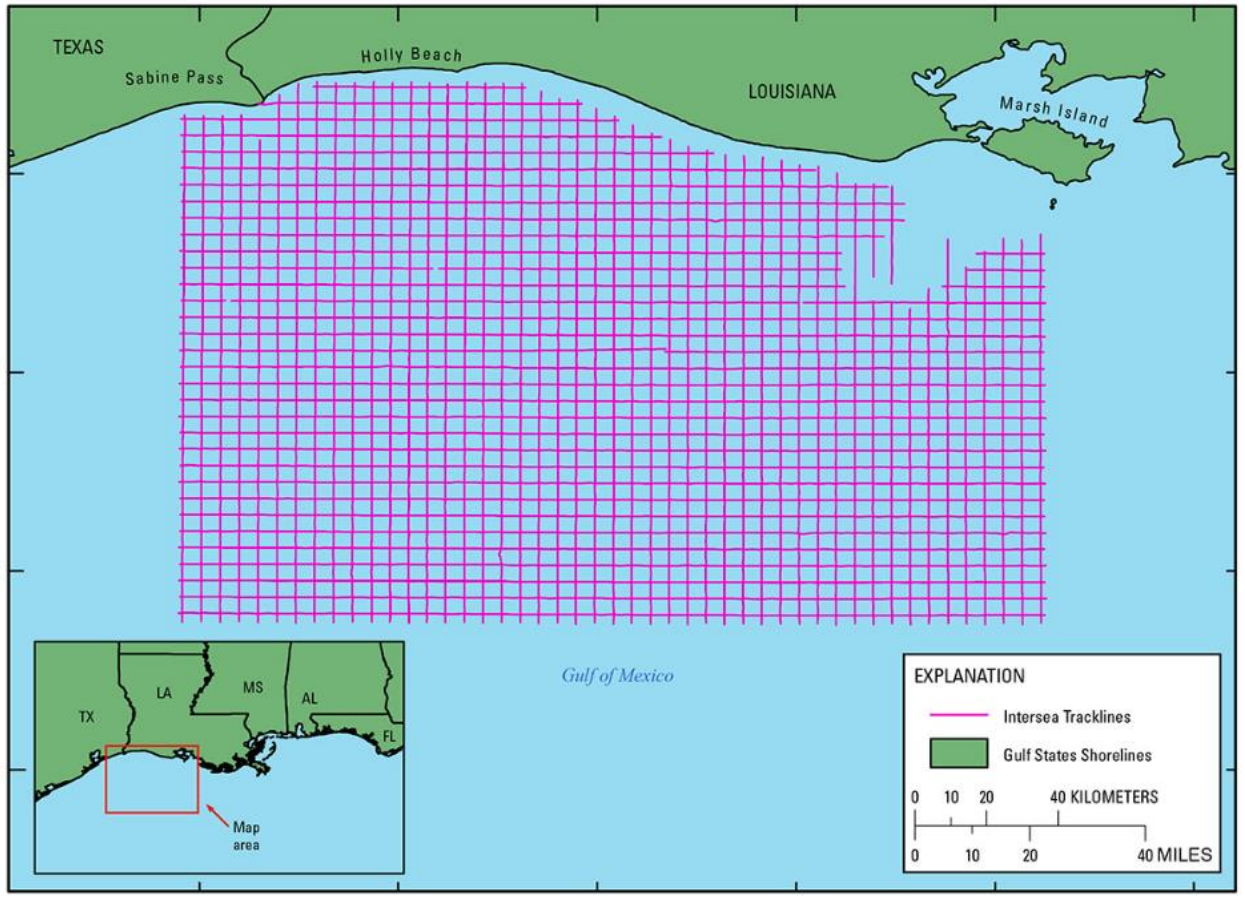
Task 1: Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf

Process and analyze digitally recovered seismic data, for near-surface sediment resource potential



Intersea single-channel seismic data (boomer)

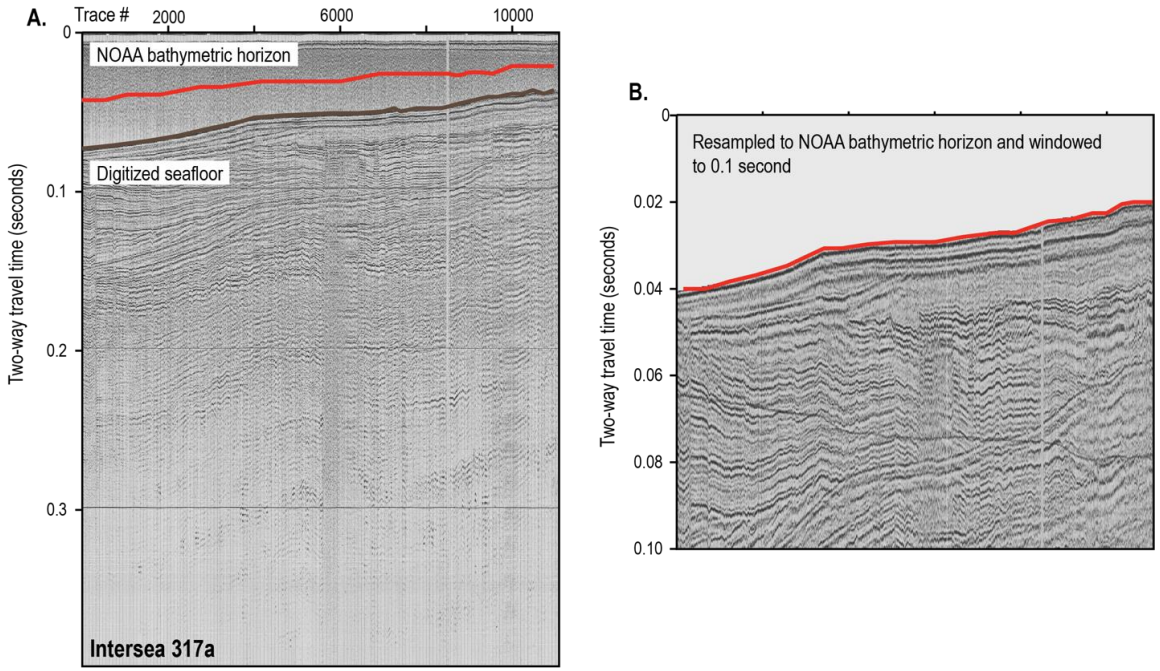
~12,400 line-km, 29,500 km²



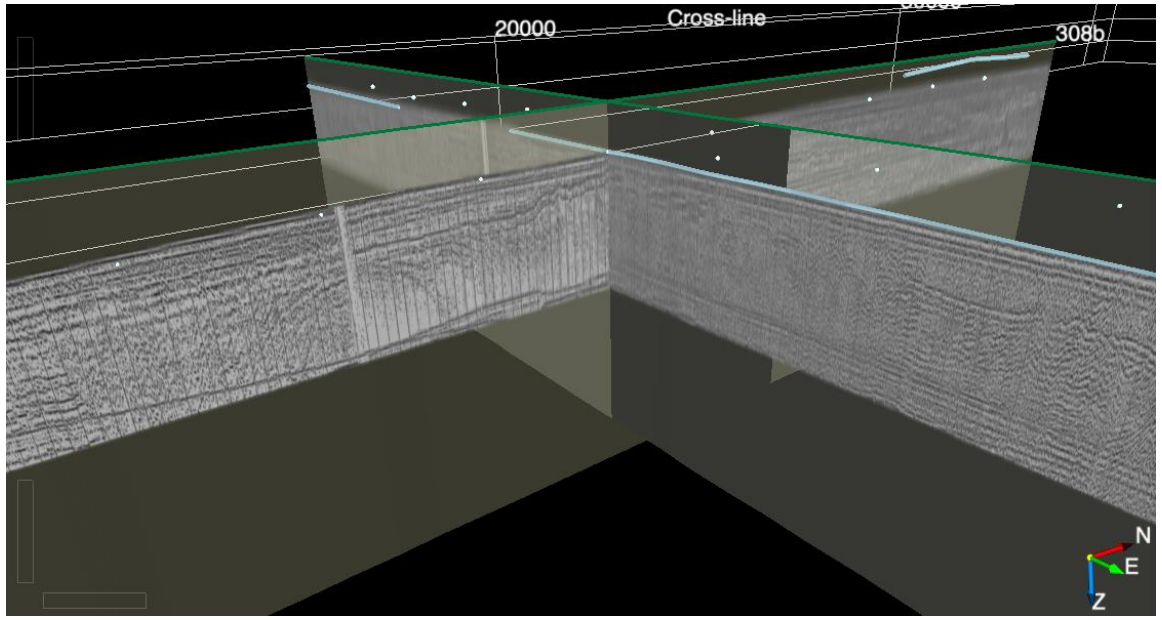
Bosse, S.T., Flocks, J.G., and Forde, A.S., 2020, Archive of digitized analog boomer seismic reflection data collected from the northern Gulf of Mexico: Intersea 1980: U.S. Geological Survey data release

Task 1: Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf

Adjust data to common datum (National Oceanic and Atmospheric Administration (NOAA) bathymetry)

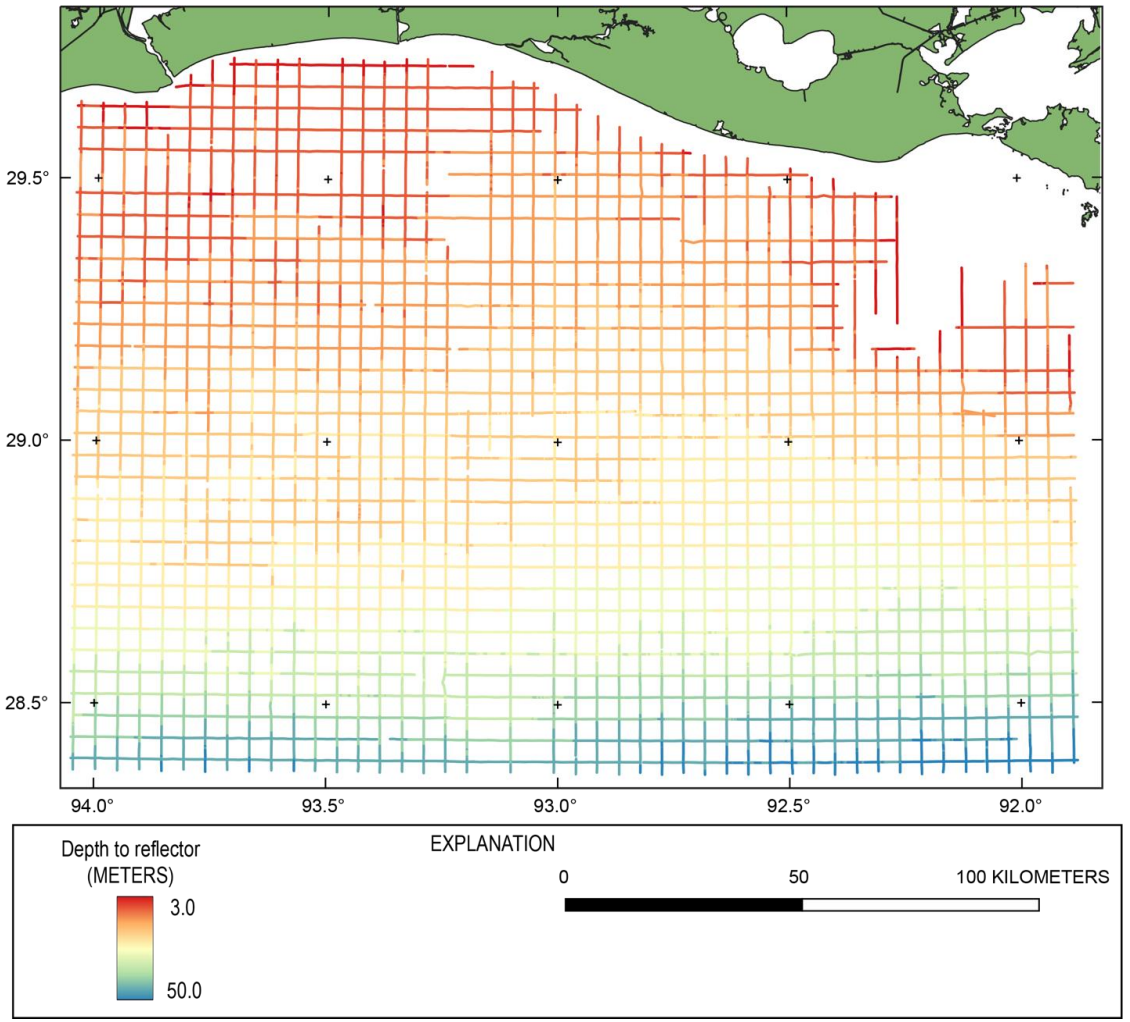


Visualize in 3-D space

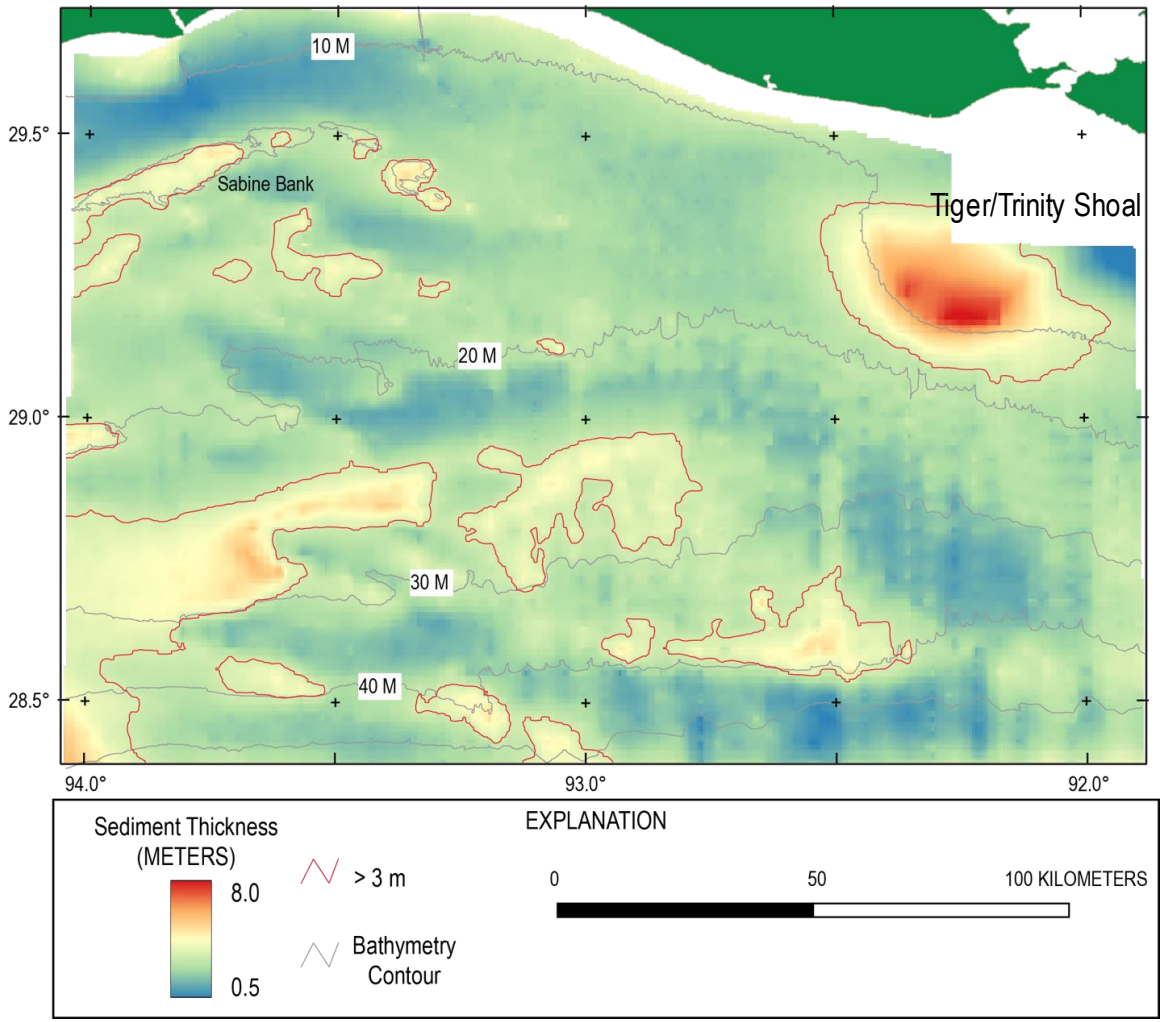


Task 1: Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf

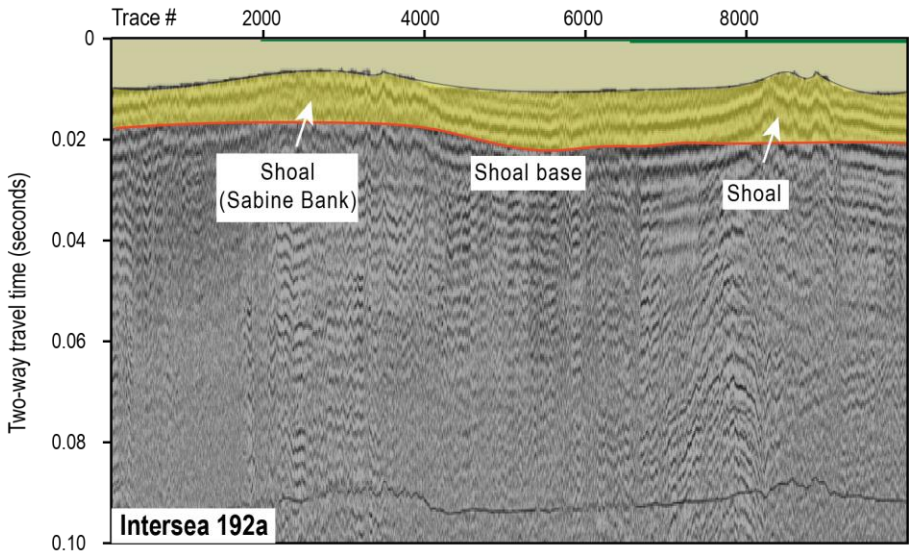
Spatial extent of transgressive deposits

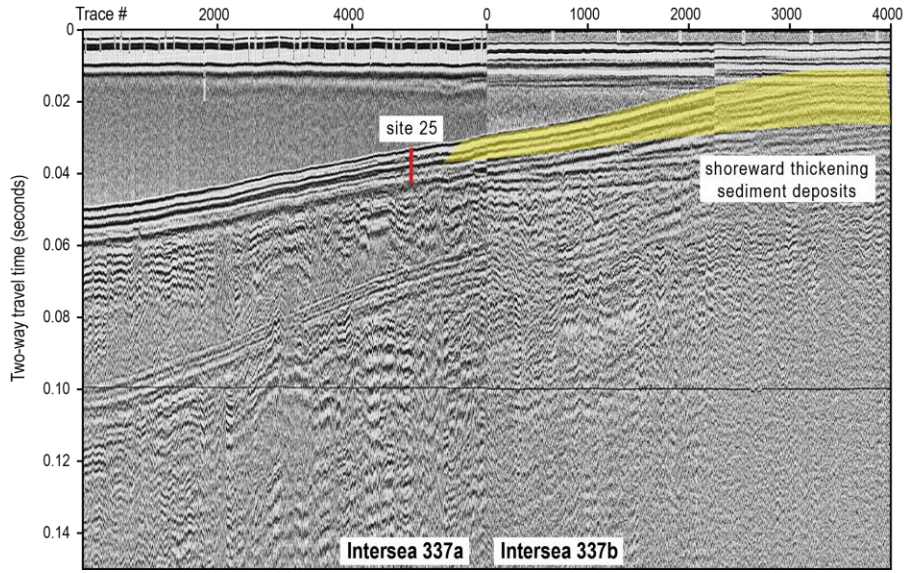


Surface features (post-transgressive deposits)



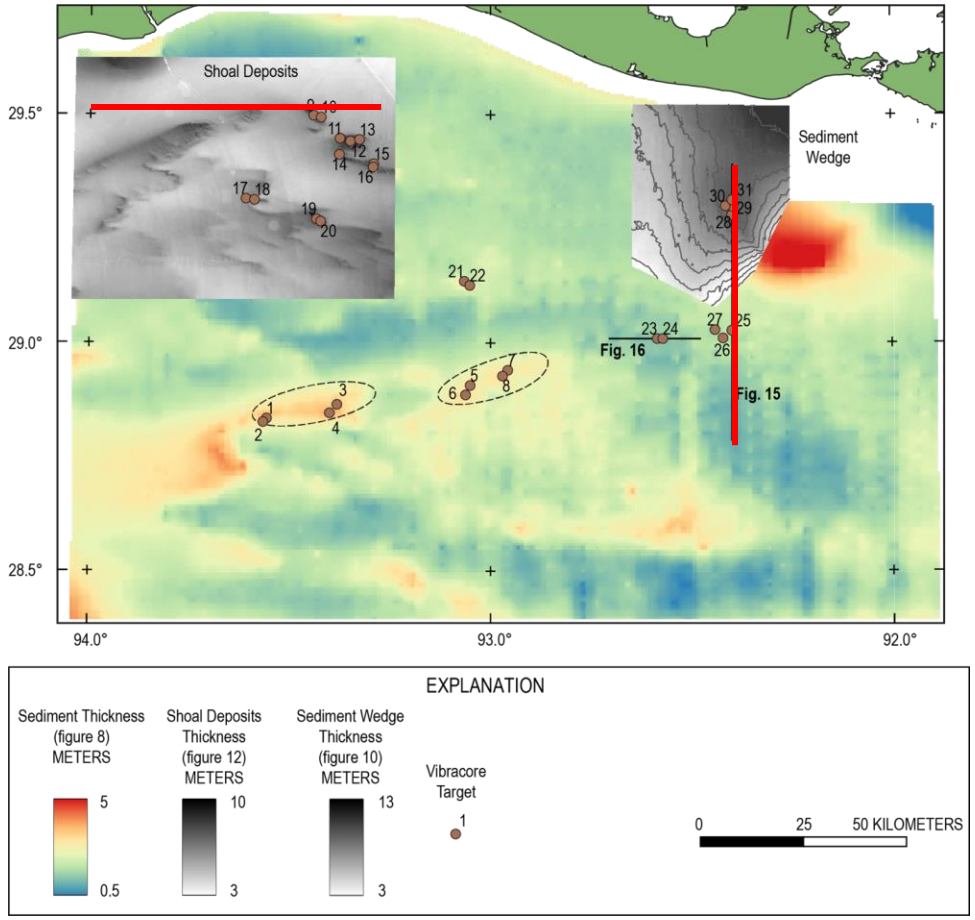
Task 1: Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf





Develop a coring strategy to investigate surface features

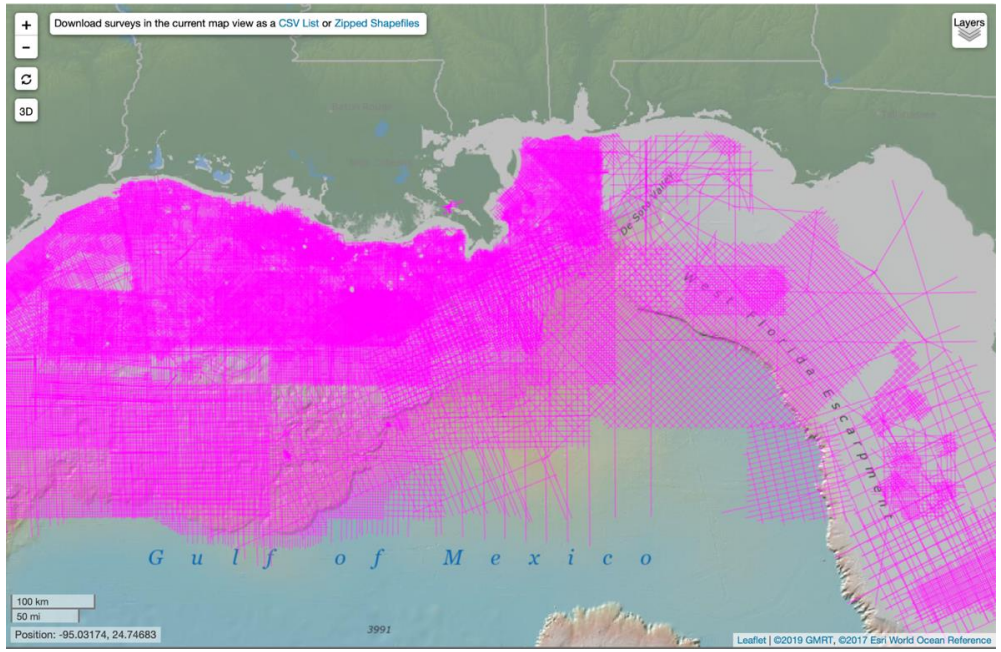
1. Target less than 4m from surface (vibracore depth)
2. Minimize overburden (suitability)
3. Water depth + overburden less than 33m (dredge depth)

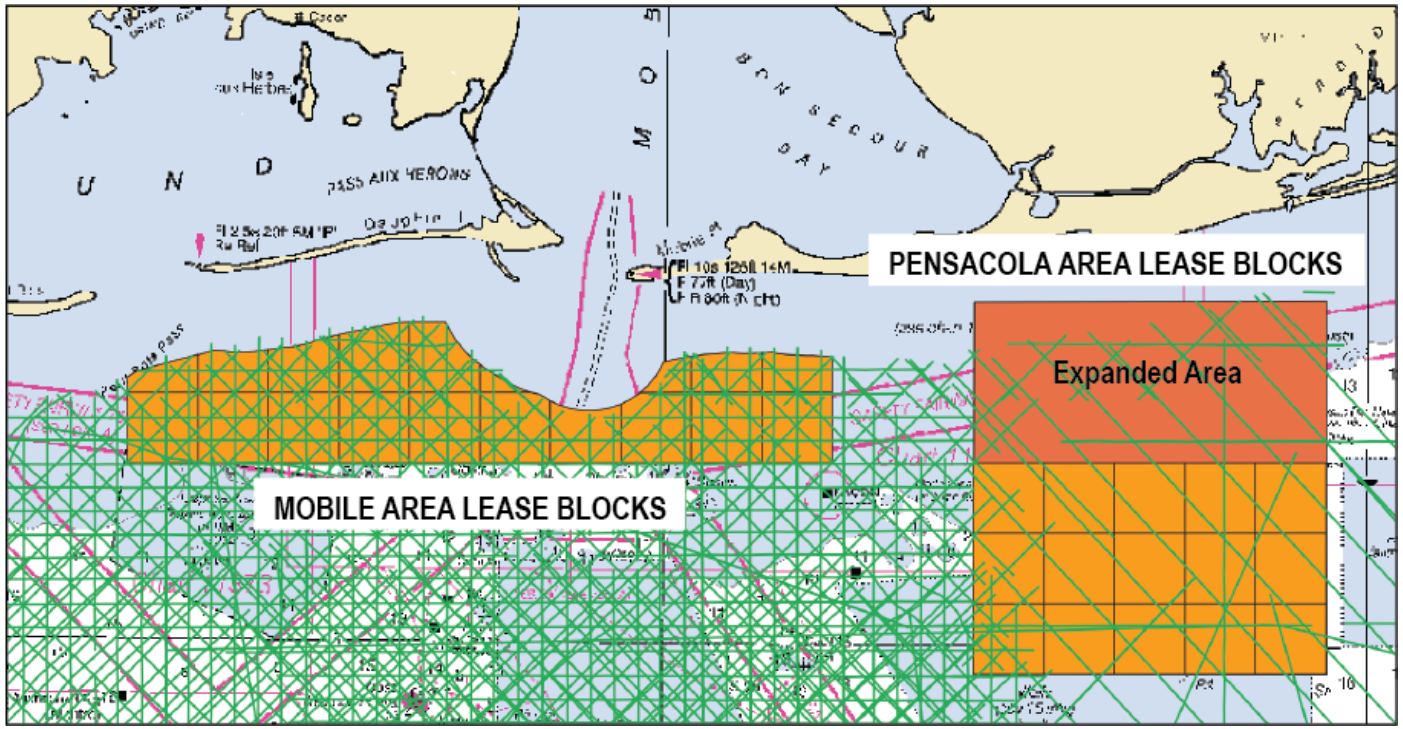


Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf (feasibility study)

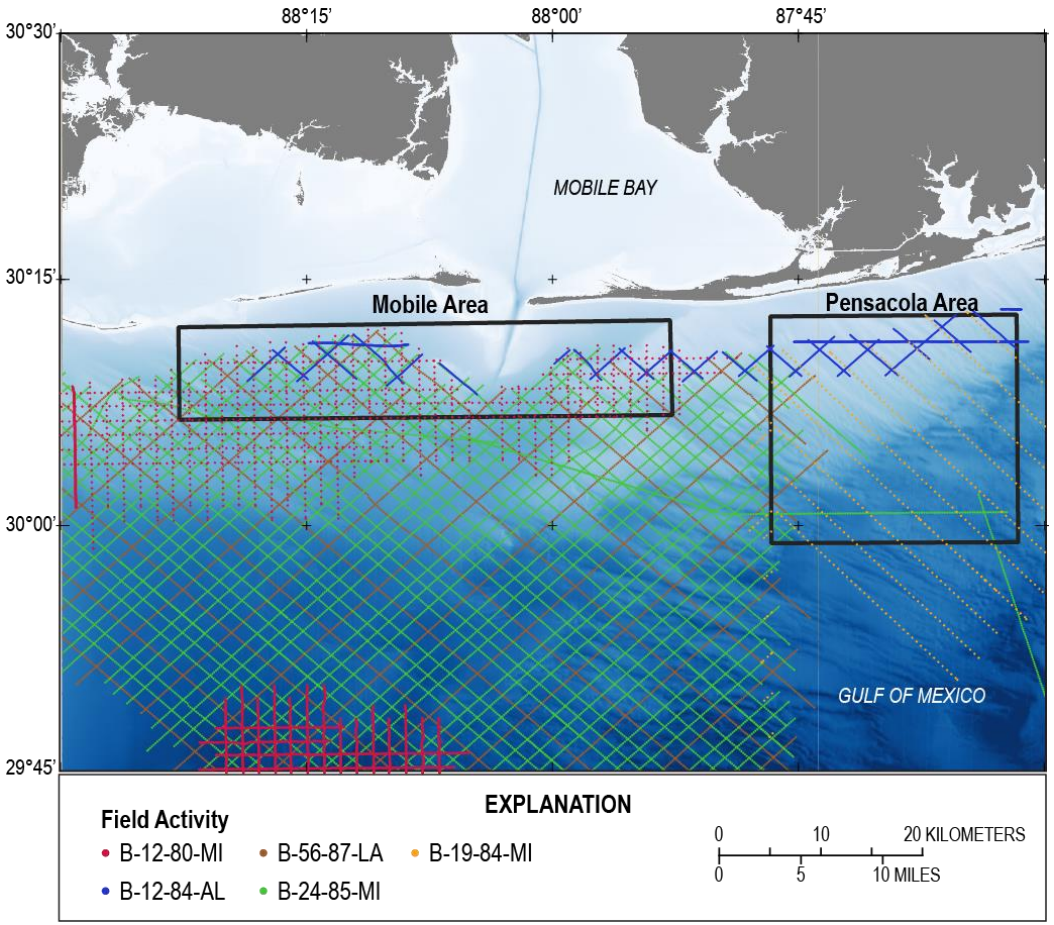
2-D Multichannel Seismic Data (National Archive of Marine Seismic Surveys Database)

https://walrus.wr.usgs.gov/namss/search/





Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf



Seismic surveys within study area

Field	Number	File	Year	Year	Acoustic	Filename
Activity	of Lines	Format	Acquired	Processed	Source	Prefix
MOBILE	N/A	N/A	N/A	N/A	N/A	N/A
B-12-80-MI*	36	SEGY	1980	2018	Air Gun	MO
B-12-84-AL	14	PDF	1984	2018	Air Gun	MAS-84
B-24-85-MI	28	SEGY	1985	2010	Air Gun	ma, wt
B-56-87-LA	10	SEGY	1987	2012	Air Gun	dmp
PENSACOLA	N/A	N/A	N/A	N/A	N/A	N/A
B-56-87-LA	4	SEGY	1987	2012	Air Gun	dmp
B-19-84-MI	11	PDF	1984	2016	Air Gun	FFI-84

Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

SEG-Y file

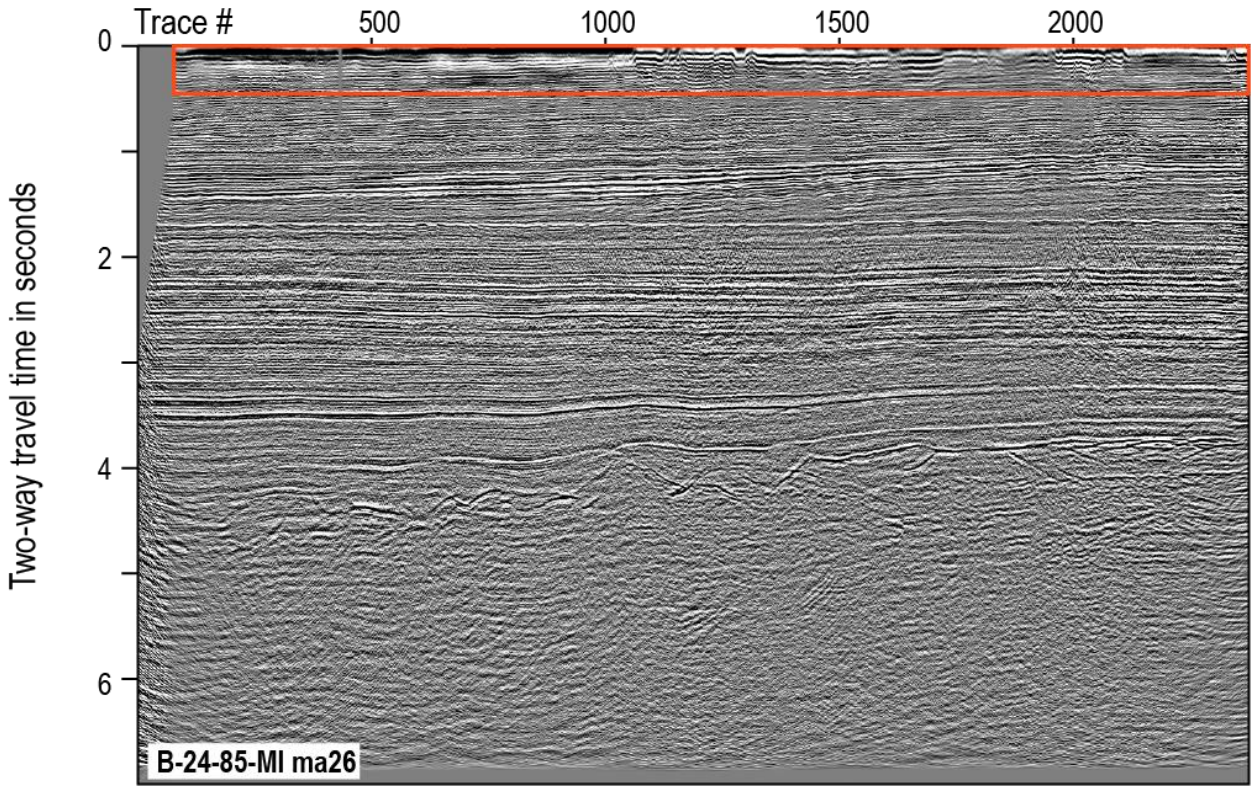
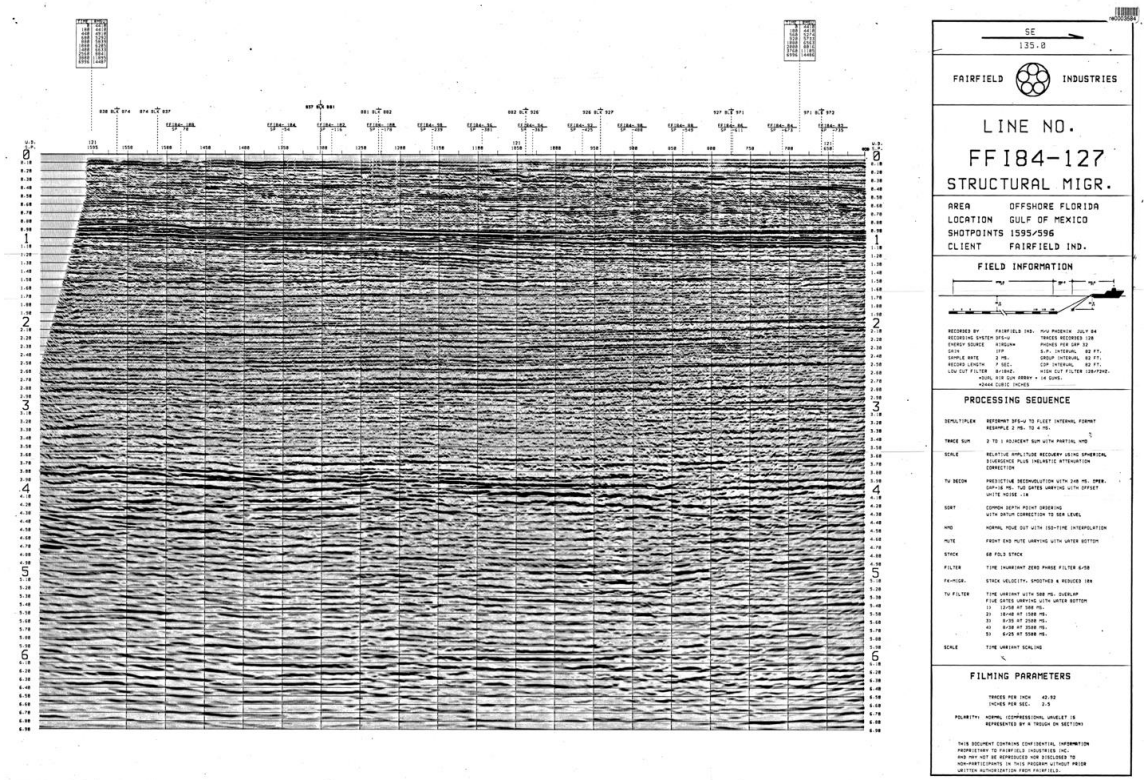


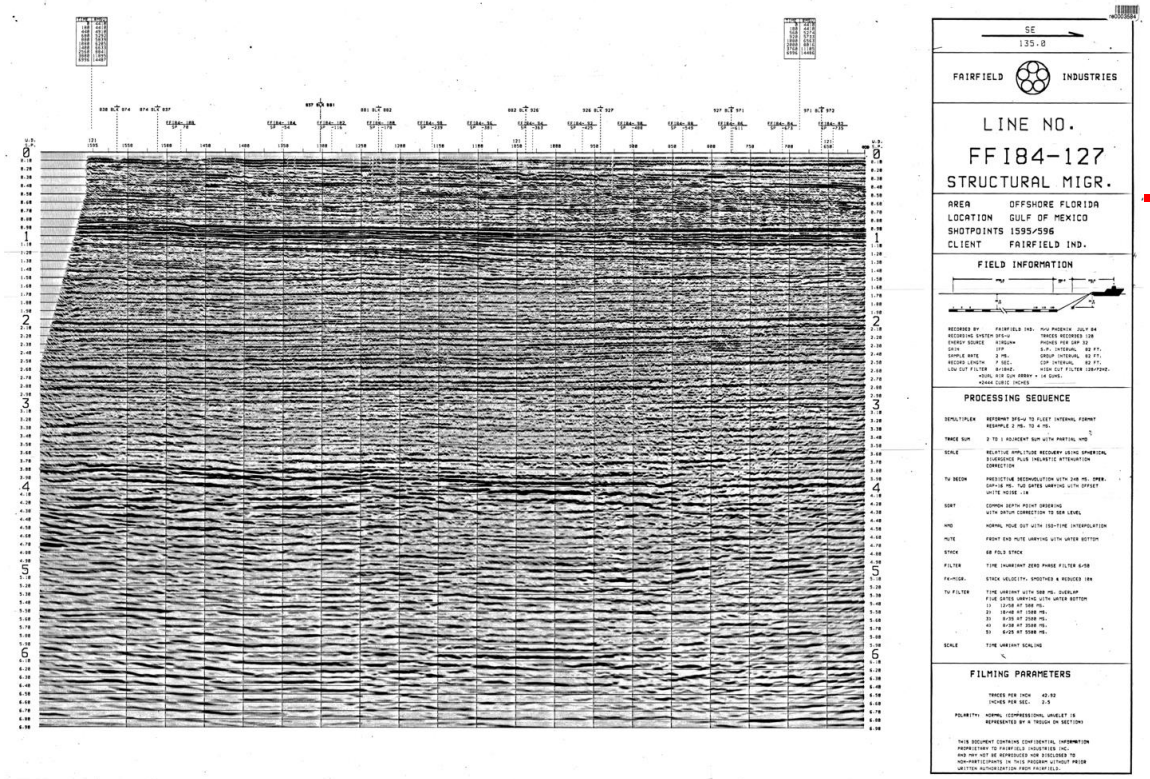
Image file (PDF)



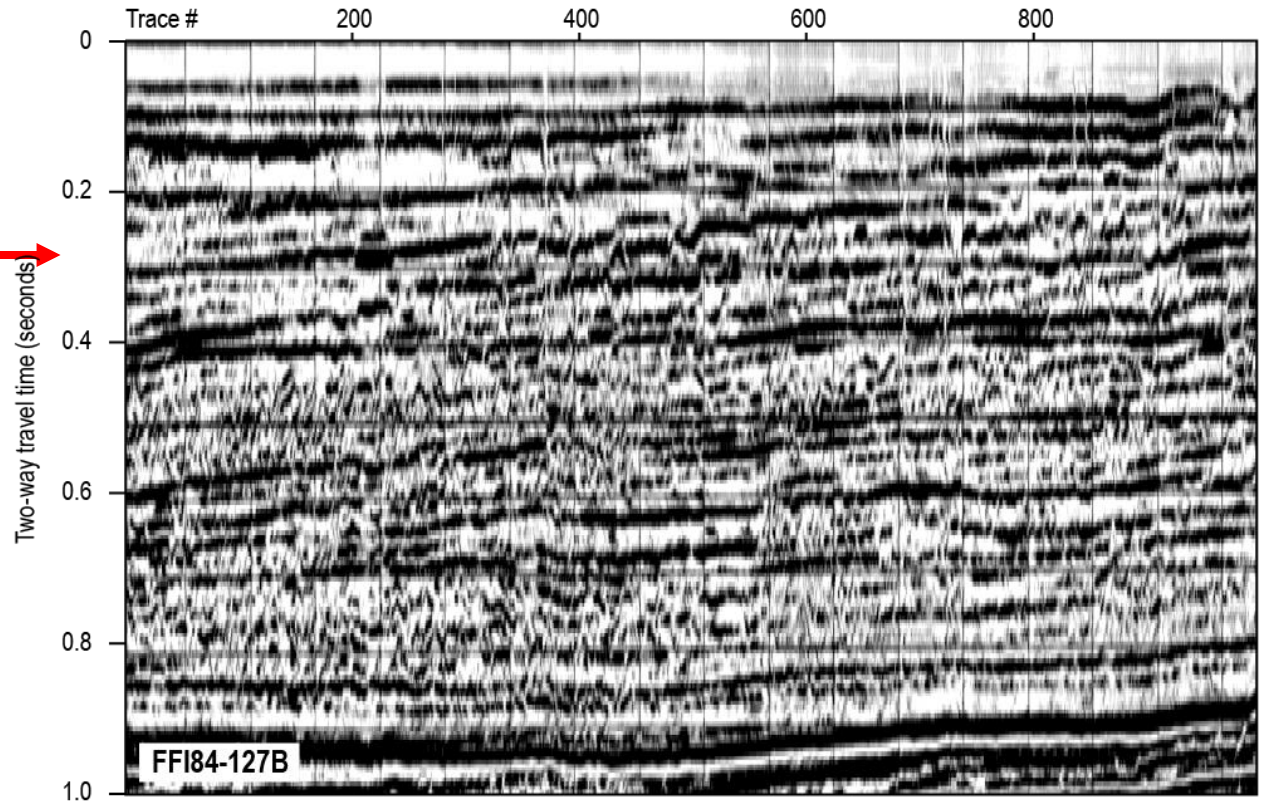
Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

Unix Scripts and programs for batch processing: Netpbm, GMT, Tif2Segy

Image file (PDF)

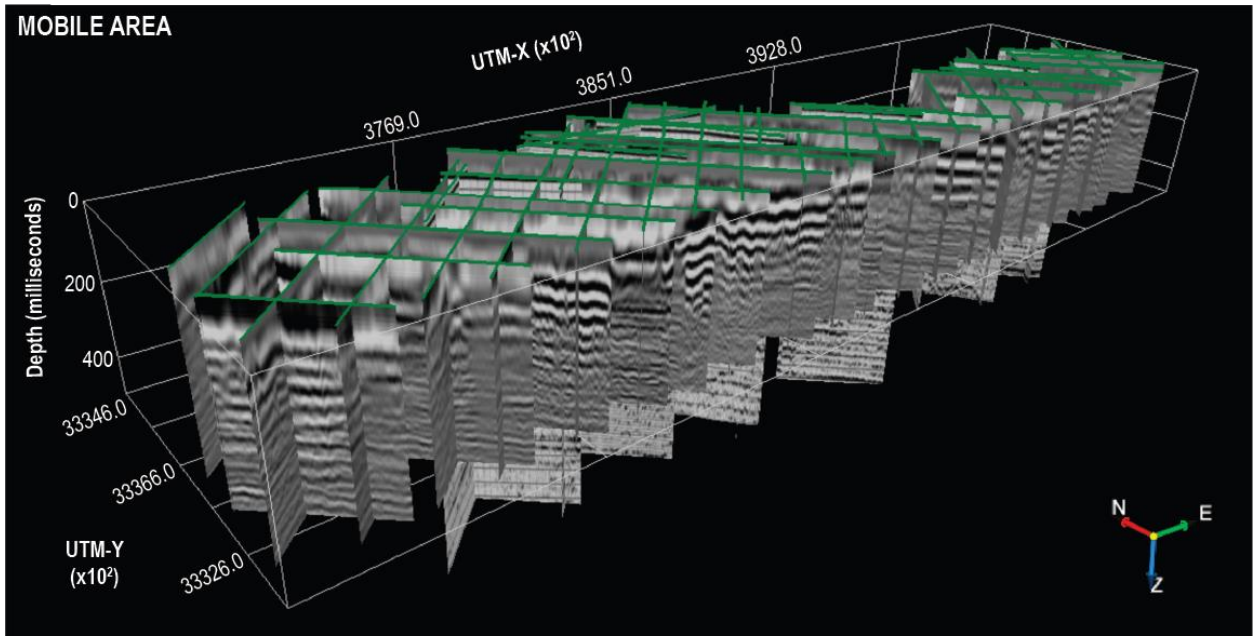


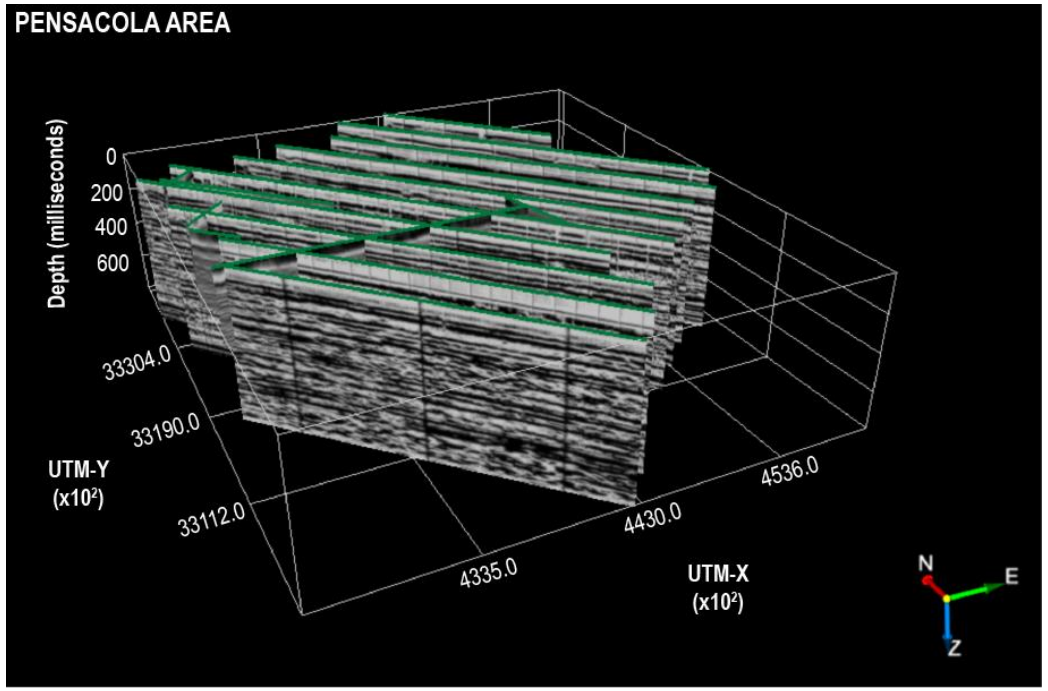
SEG-Y file



Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

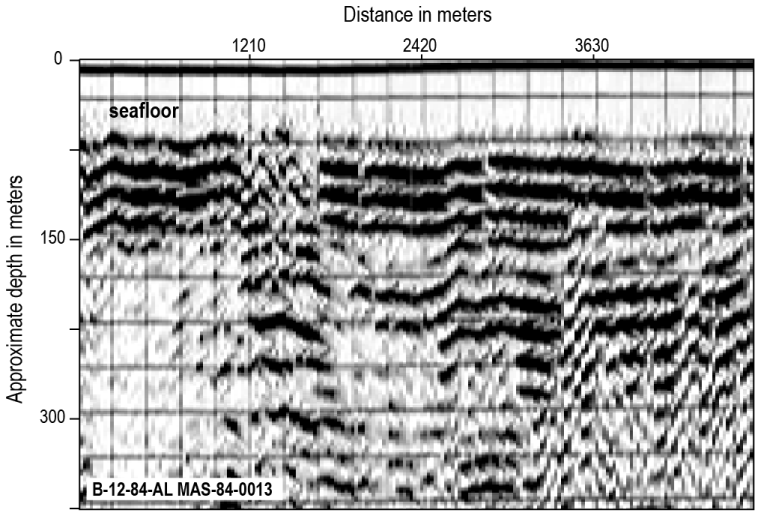
3D Alignment and Visualization

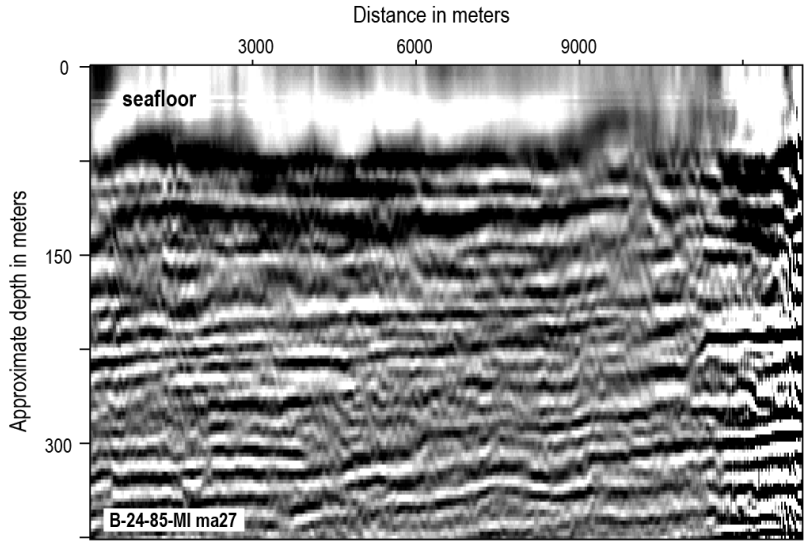


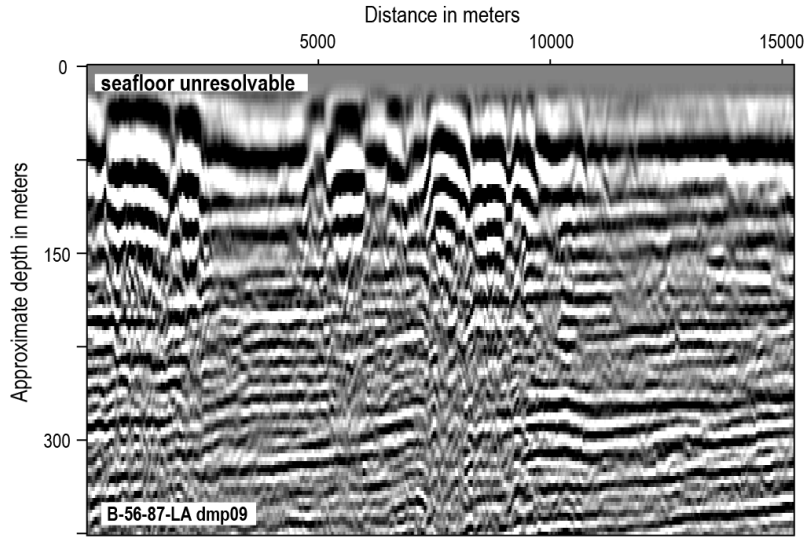


Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

Resolving surface features

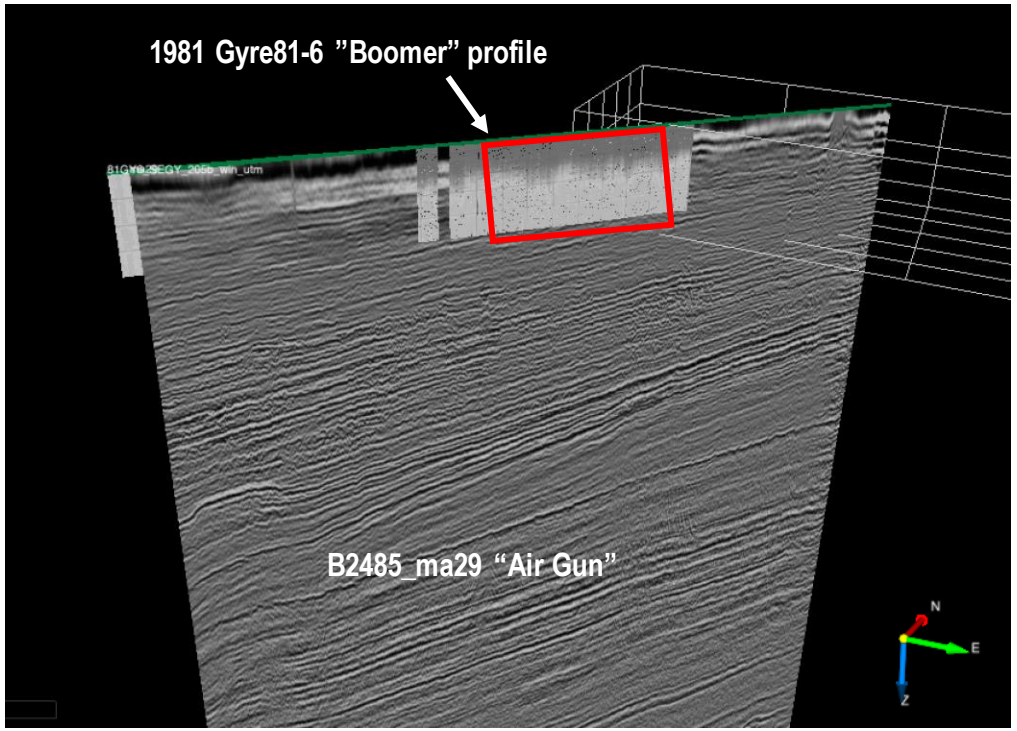


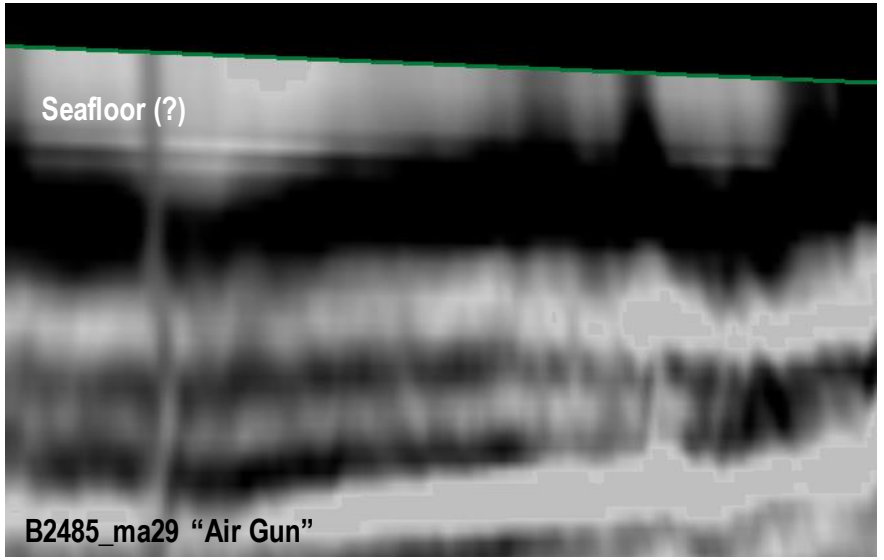


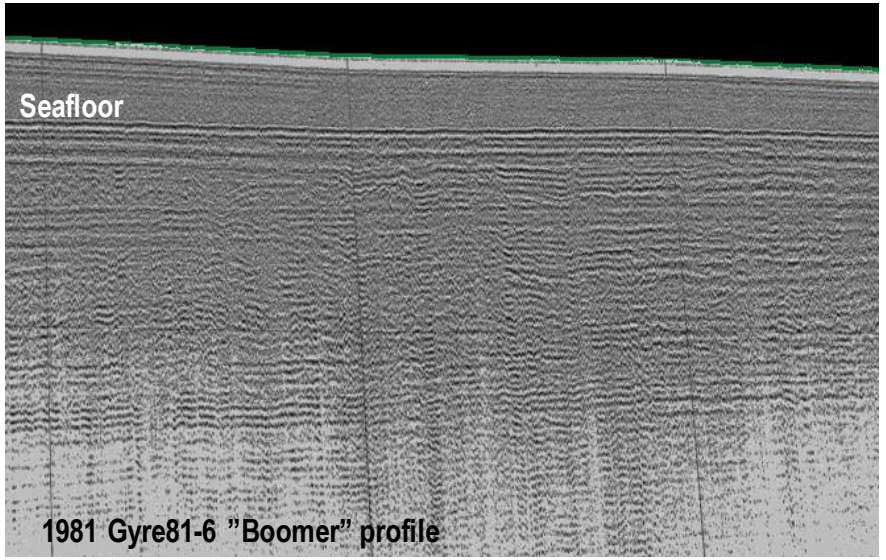


Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

Resolving surface features:
O&G 2D multichannel versus high-resolution seismic profile







Task 2: Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf

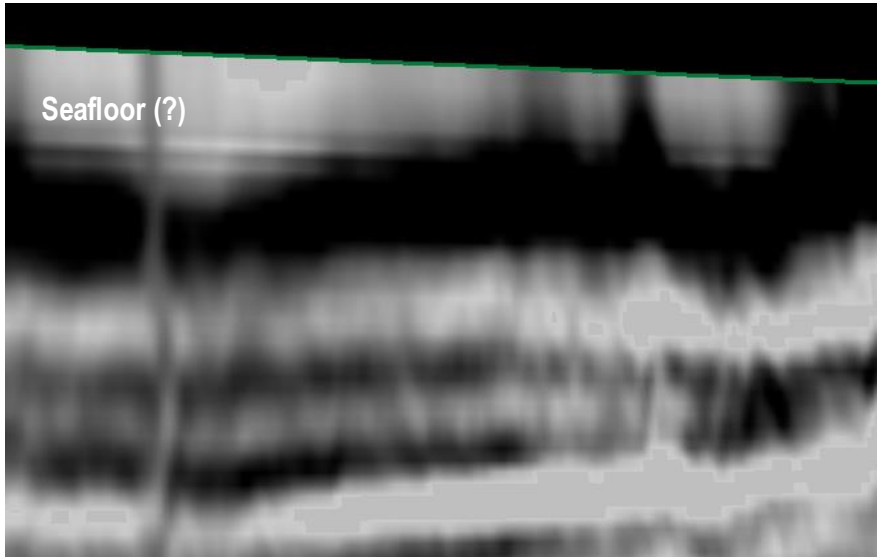
Results of study:

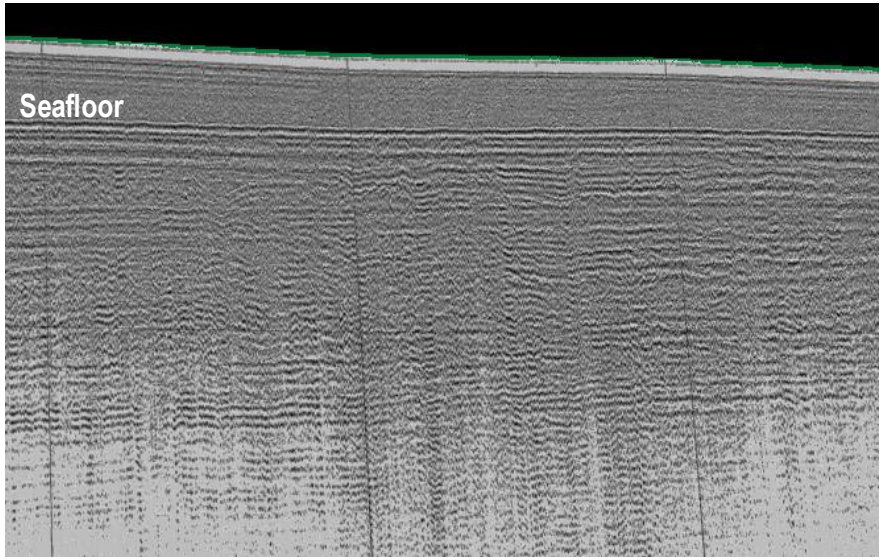
- The O&G 2-D multichannel seismic data is accessible and complete (some navigation and image manipulation necessary)

- Data can be visualized in modern software packages

- Resolution of data at the seafloor *is not* adequate to confidently pick the seafloor reflector or identify morphologic features (*in target areas*)

  (note: mileage may vary)





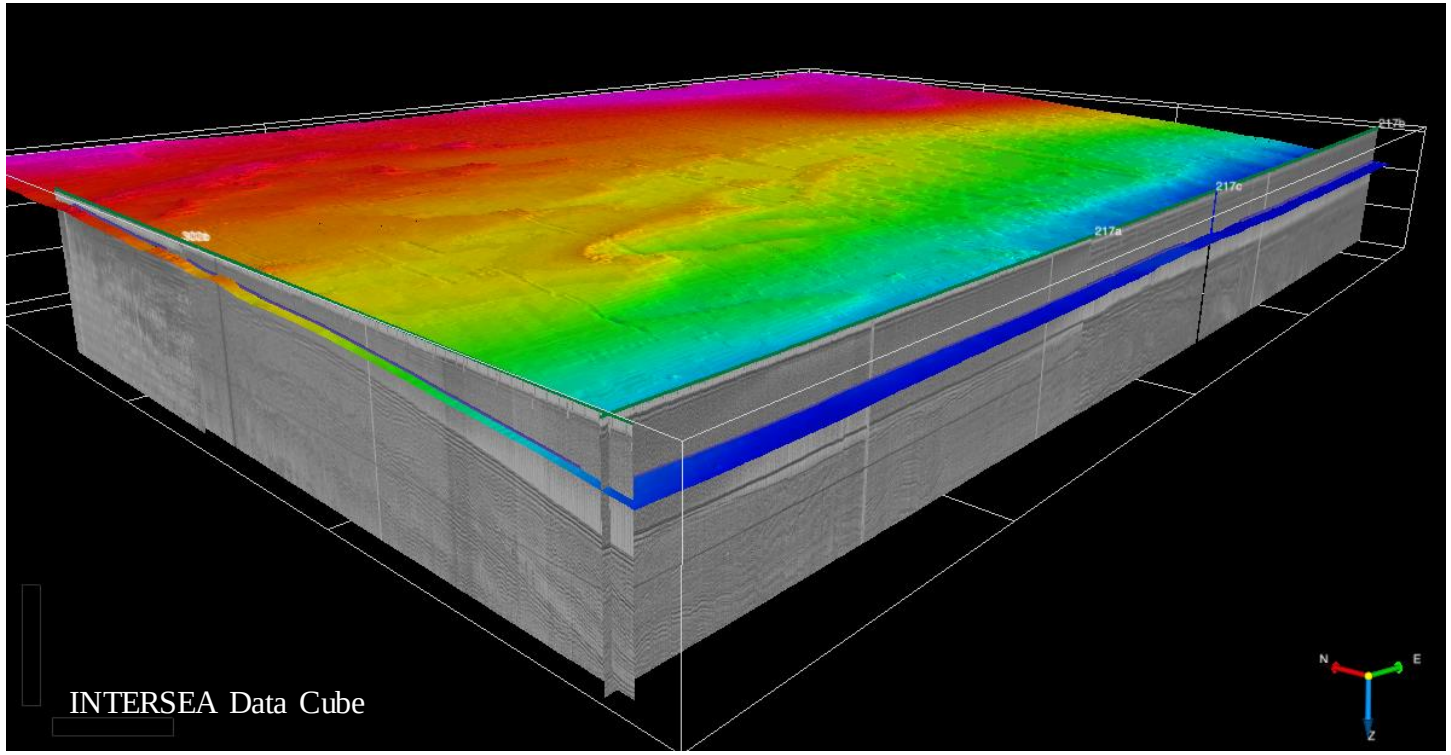
Usability of Historical Seismic Data in Surface Sediment Resource Evaluation

Analysis of Digitally Recovered Single-Channel Seismic Data (Intersea) from the Texas-Louisiana Outer Continental Shelf

Evaluation of Oil and Gas Industry Two-Dimensional Multichannel Seismic Data from the Alabama-Florida Outer Continental Shelf for use in Near-Surface Assessment of the Geologic Framework and Potential

QUESTIONS?

USGS science for a changing world



BOEM Bureau of Ocean Energy Management