

# **AV Discovering the Missing Piece of the Gulf of Mexico Geologic Puzzle\***

**James R. Moffett<sup>1</sup>**

Search and Discovery Article #110198 (2015)\*\*  
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\*Adapted from presentation at the AAPG DPA Playmaker Forum 2.0, “DPA: Resources for Explorers,” January 23, 2014, Houston, Texas

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<sup>1</sup>Chairman of the Board / CoFounder, Freeport-McMoRan Inc., New Orleans, LA / Phoenix, AZ ([mr@fmi.com](mailto:mr@fmi.com))

## **Key Points**

**Wells drilled on Gulf of Mexico Shelf--** in water depths less than 200 meters

- Approximately 50,000 drilled to depths less than or equal to 15,000 feet
- Approximately 4600 wells drilled below 15,000 feet
- Fourteen wells drilled below 25,000 feet

## **Deep Gas Shelf Play**

- Shallow waters of GOM/onshore South Louisiana
- Targets sections above the salt weld
- Multi-100 Bcfe-1 Tcfe reserve potential
- Well depths range from 15,000 feet to 25,000 feet
- Below previous production (i.e., deeper pool concept)
- Near existing infrastructure which allows rapid development

## **Ultra-Deep Shelf Play**

- Offshore ± 100 feet waters of GOM
- Targets sections below the salt weld
- +1 Tcfe of reserve potential
- Well depths range from 25,000 feet to 35,000 feet
- Deeply buried structures with analogs to deepwater discoveries
- Near existing infrastructure; approximate 18-month lead time for production casing, trees & safety valves may be required due to increased pressures/temperatures

Both Deep Gas Shelf and Ultra-Deep Shelf Plays are vastly under-explored early results confirm presence of hydrocarbons at depth in GOM.

Drilling activities to date have successfully confirmed geologic model and have indicated the potential for a major new geologic trend spanning 200 miles in the shallow waters of the GOM and onshore in the Gulf Coast area.

**Davy Jones—Major ultra-deep discovery**

Important geologic results combined with the data available from other wells are redefining the subsurface geologic landscape below 20,000 feet on the shelf of the Gulf of Mexico

- Discovery Well
  - Logged high-quality Wilcox pays on large structure
  - All of the zones were full to base
- Offset Well
  - Confirmed Wilcox Sand continuity 2½ miles away
  - Encountered Tuscaloosa Sands and Cretaceous Carbonate
- Commenced completion of offset well in 4Q13 – Anticipated flow testing in 1H14



***– AAPG Playmaker 2.0 Forum –***

***"Discovering the Missing Piece  
of the Gulf of Mexico  
Geologic Puzzle"***

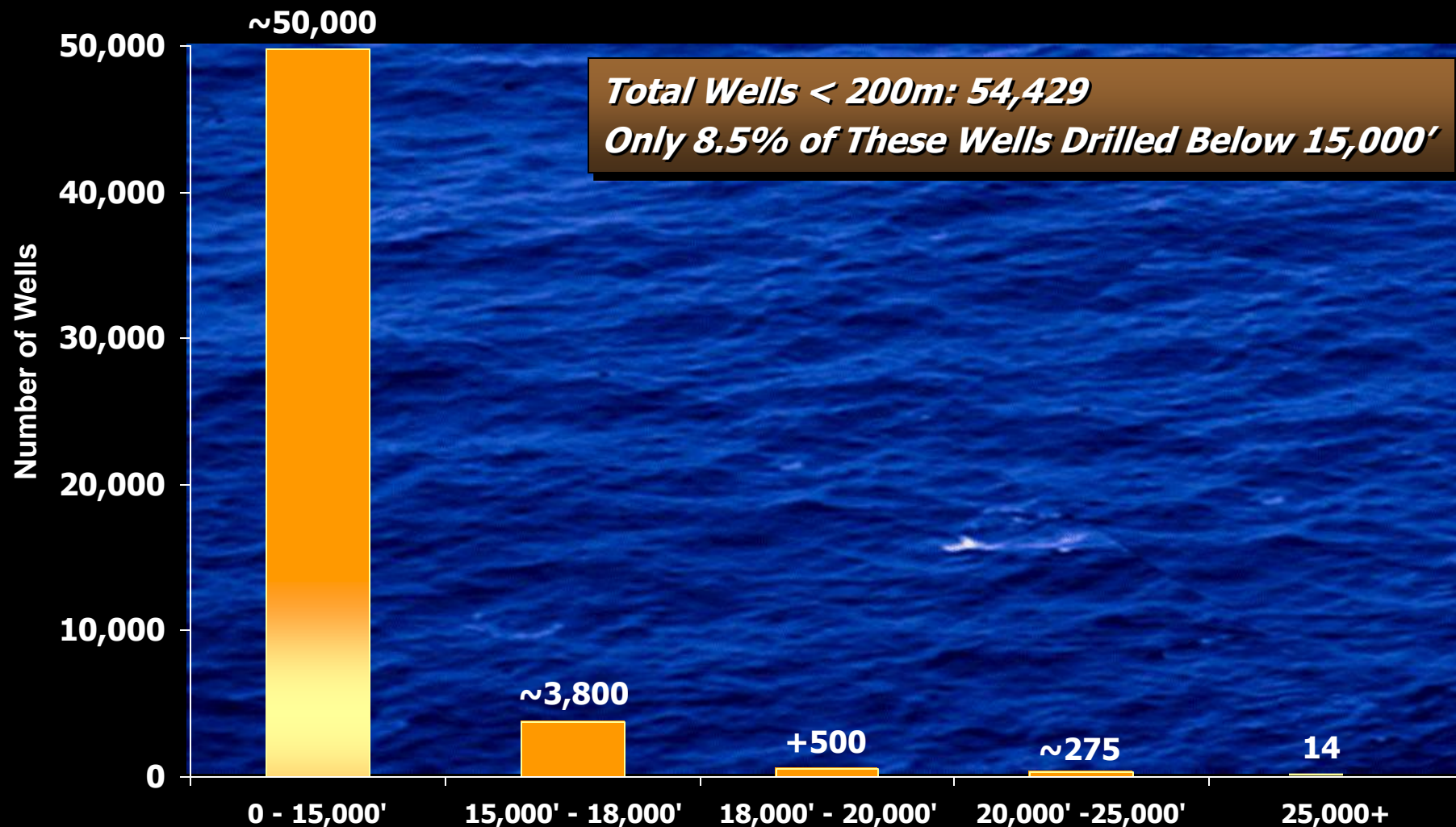
***James R. Moffett***  
***Chairman of the Board***

***January 23, 2014***



# *Wells Drilled on Gulf of Mexico Shelf*

## *Wells Drilled Greater Than 15,000' TVD in Less Than 200 Meters*



Source: OOSA, 1/16/14



# ***Deep Gas vs. Ultra-Deep Gas***

## ***Deep Gas Shelf Play***

- **Shallow Waters of GOM/Onshore South Louisiana**
- **Targets Sections Above the Salt Weld**
- **Multi-100 Bcfe-1 Tcfe Reserve Potential**
- **Well Depths Range From 15,000' to 25,000'**
- **Below Previous Production (i.e., Deeper Pool Concept)**
- **Near Existing Infrastructure Which Allows Rapid Development**

## ***Ultra-Deep Shelf Play***

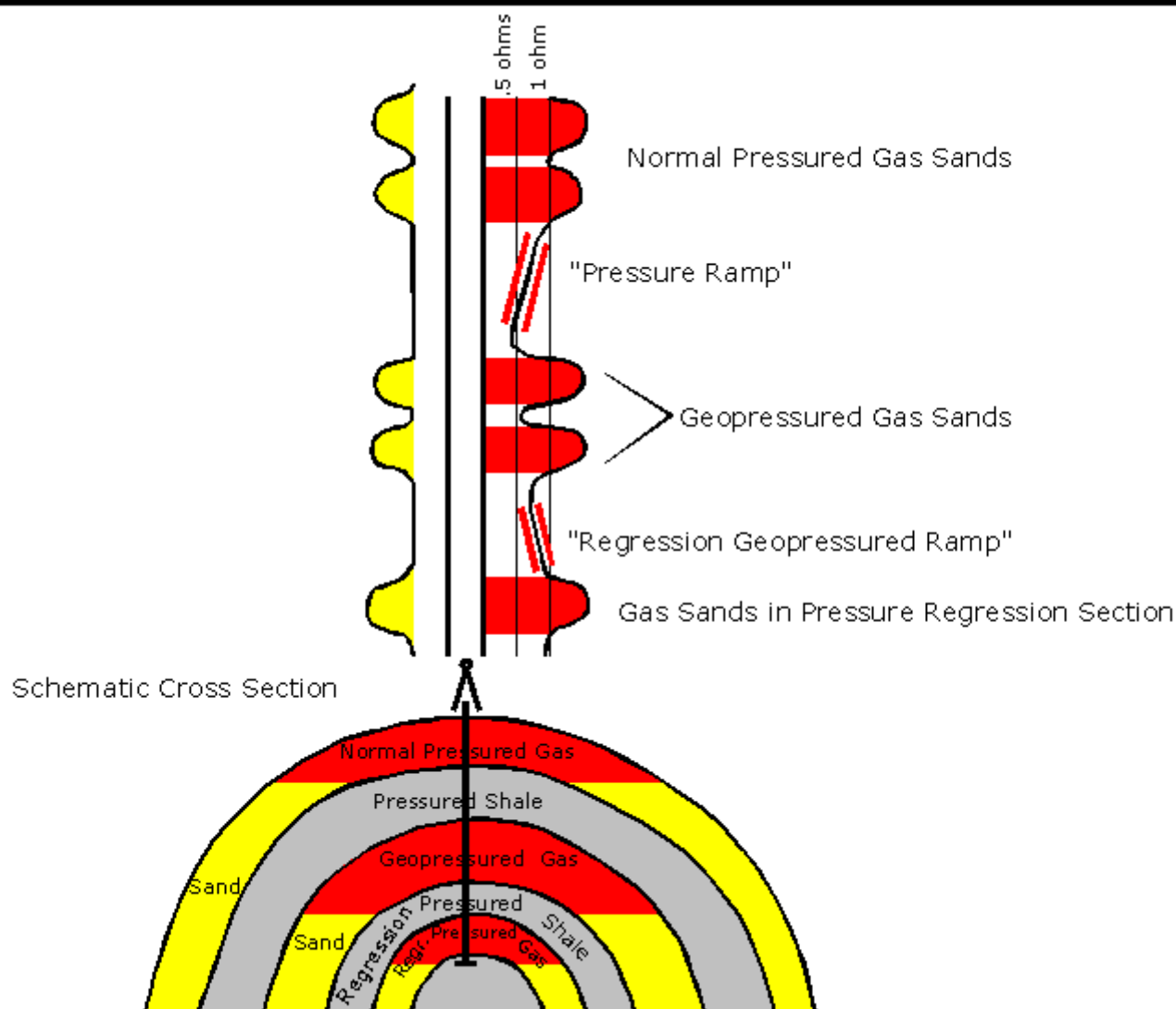
- **Offshore 100' Waters of GOM**
- **Targets Sections Below the Salt Weld**
- **+1 Tcfe of Reserve Potential**
- **Well Depths Range From 25,000' to 35,000'**
- **Deeply Buried Structures with Analogs to Deepwater Discoveries**
- **Near Existing Infrastructure; ~ 18-Mo. Lead Time for Production Casing, Trees & Safety Valves May be Required Due to Increased Pressures/Temperatures**

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***Both Plays Are Vastly Under-Explored  
Early Results Confirm Presence of Hydrocarbons at Depth in GOM***

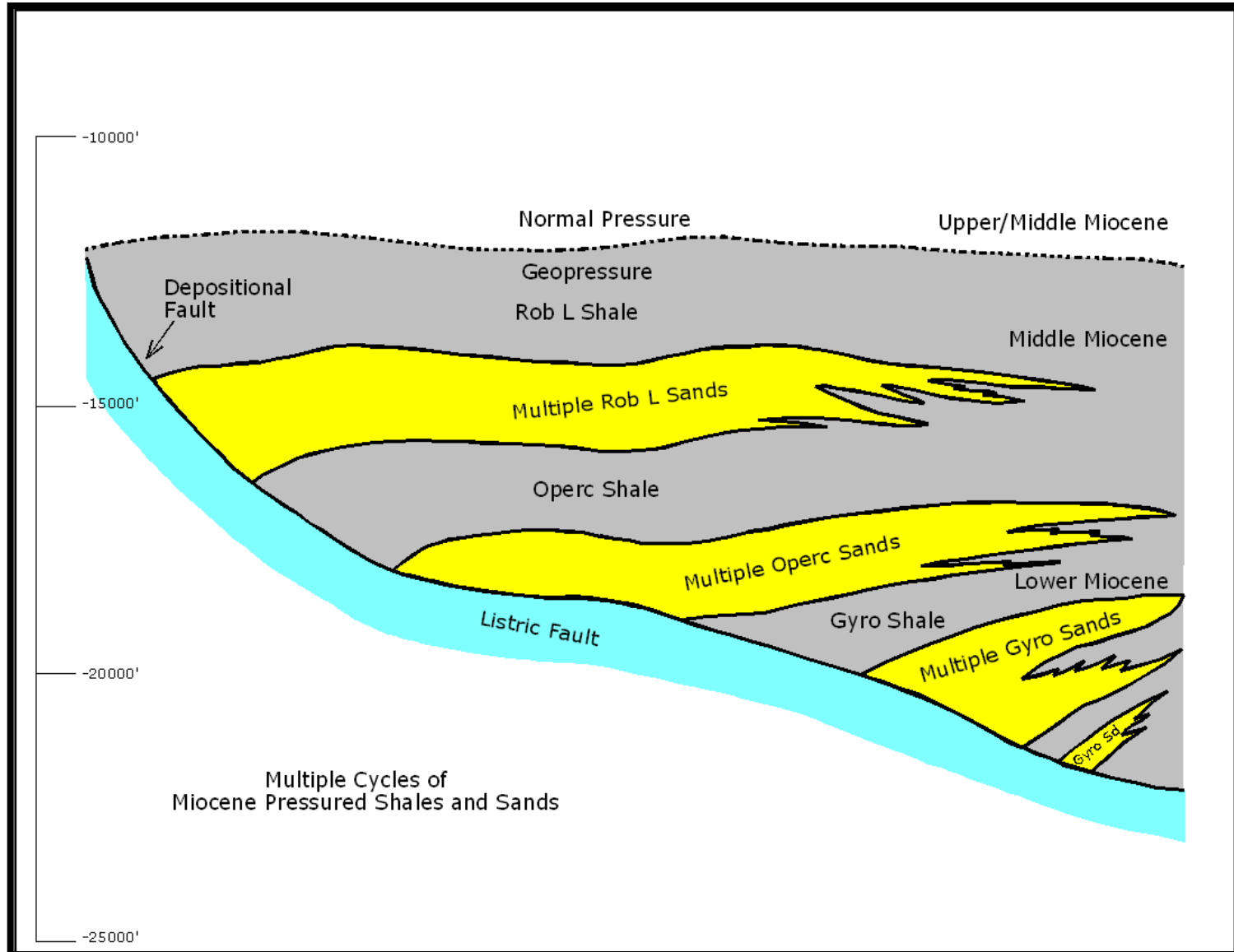


# Conceptual "Suitcase" Shales Schematic 4-Way Closure Model



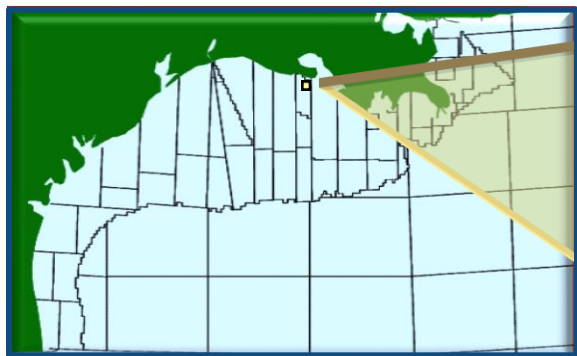


# *Louisiana Depositional Model*



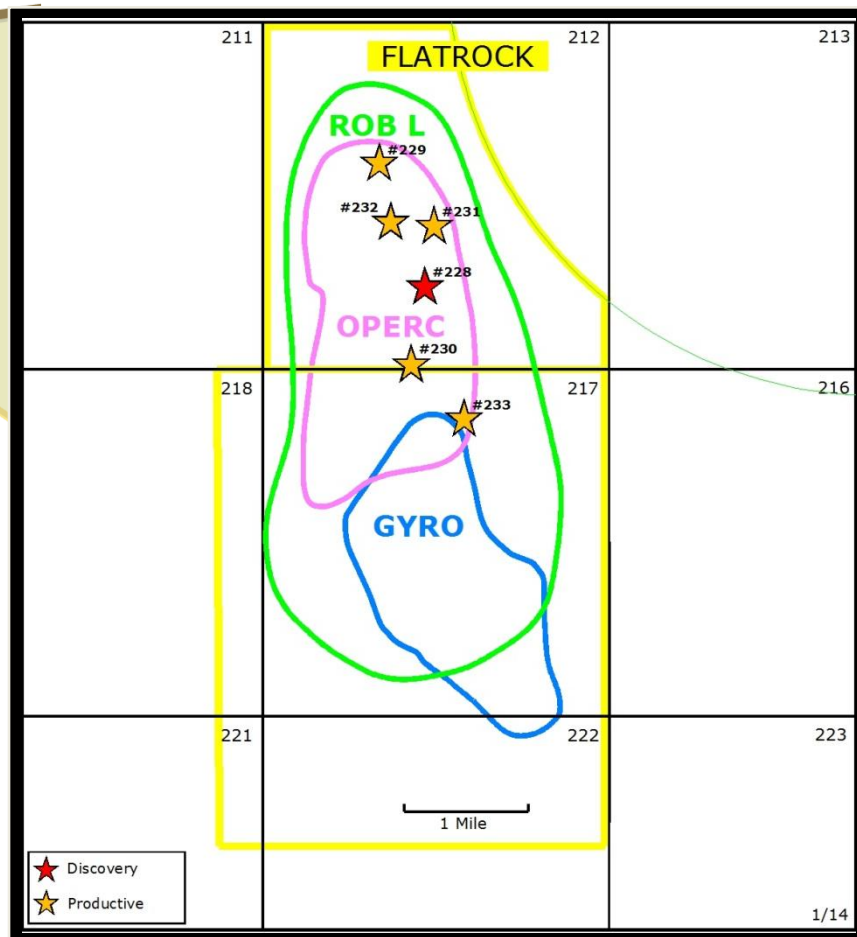
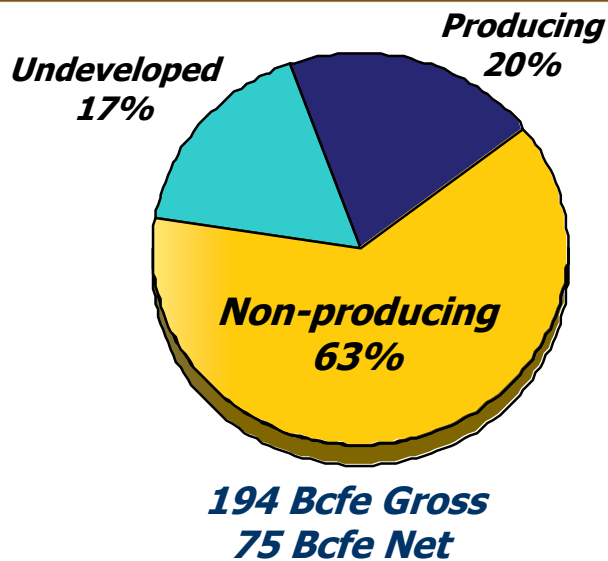


# Flatrock Major Discovery



~325 Bcfe of Gross Production To Date

**Flatrock Ryder Scott  
Proved Reserves at 12/31/12**



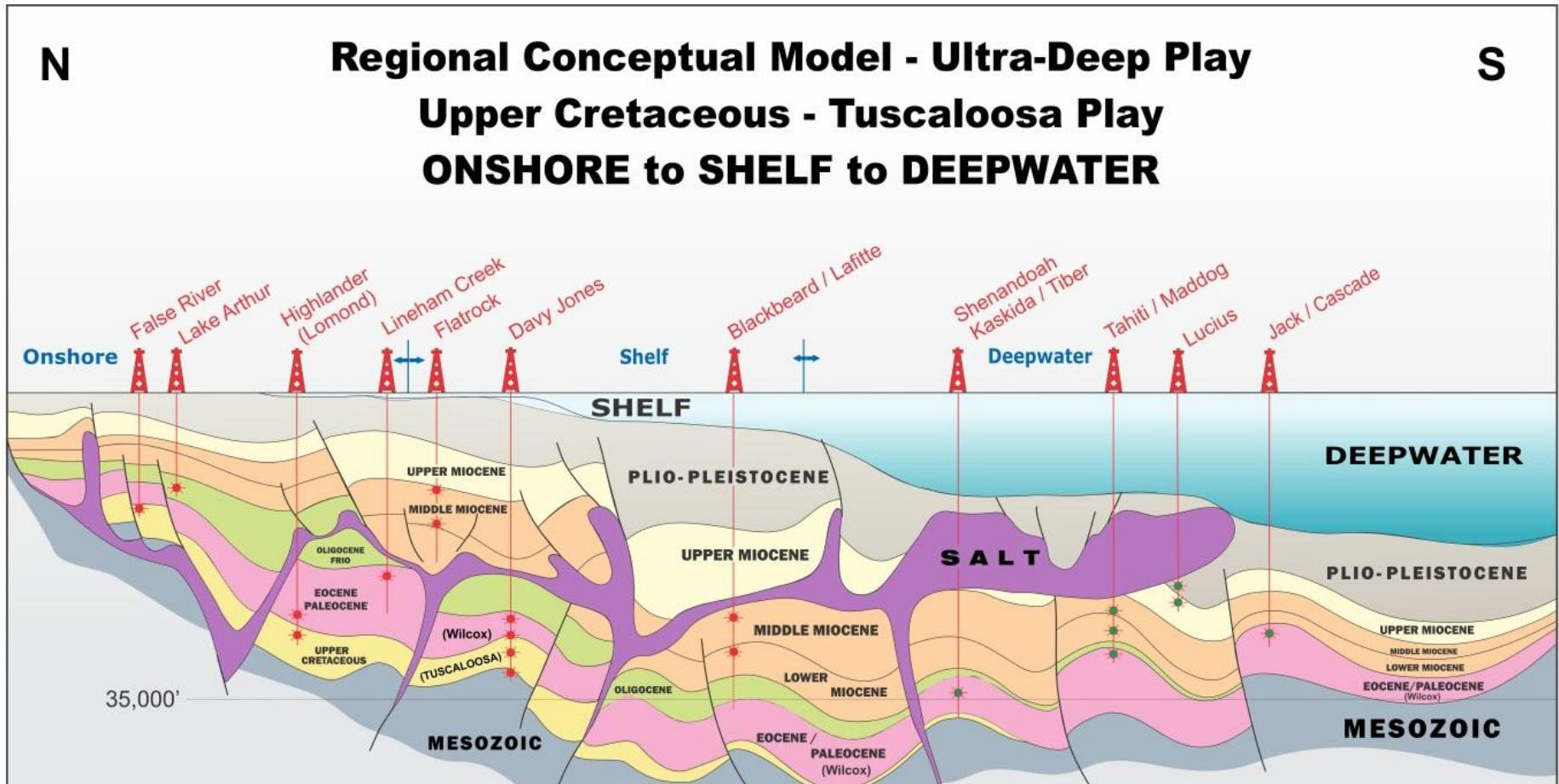
**Located on OCS 310 at  
South Marsh Island Block 212/217  
in 10 Feet of Water**





# *Conceptual Model - Ultra-Deep Play*

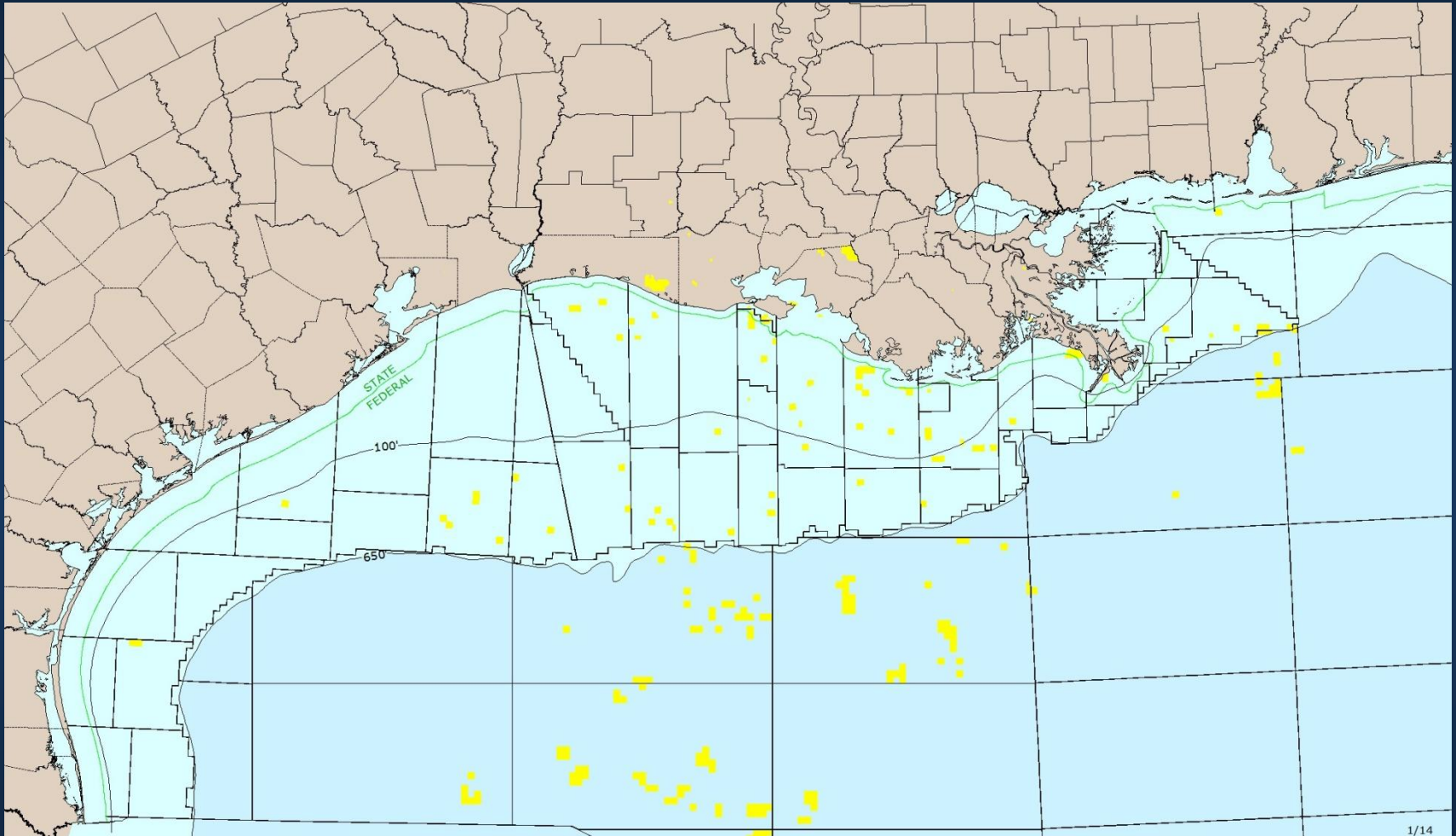
*Recognized as Industry Leader in This New Exploration Frontier*



*Drilling activities to date have successfully confirmed geologic model and have indicated the potential for a major new geologic trend spanning 200 miles in the shallow waters of the GOM and onshore in the Gulf Coast area.*

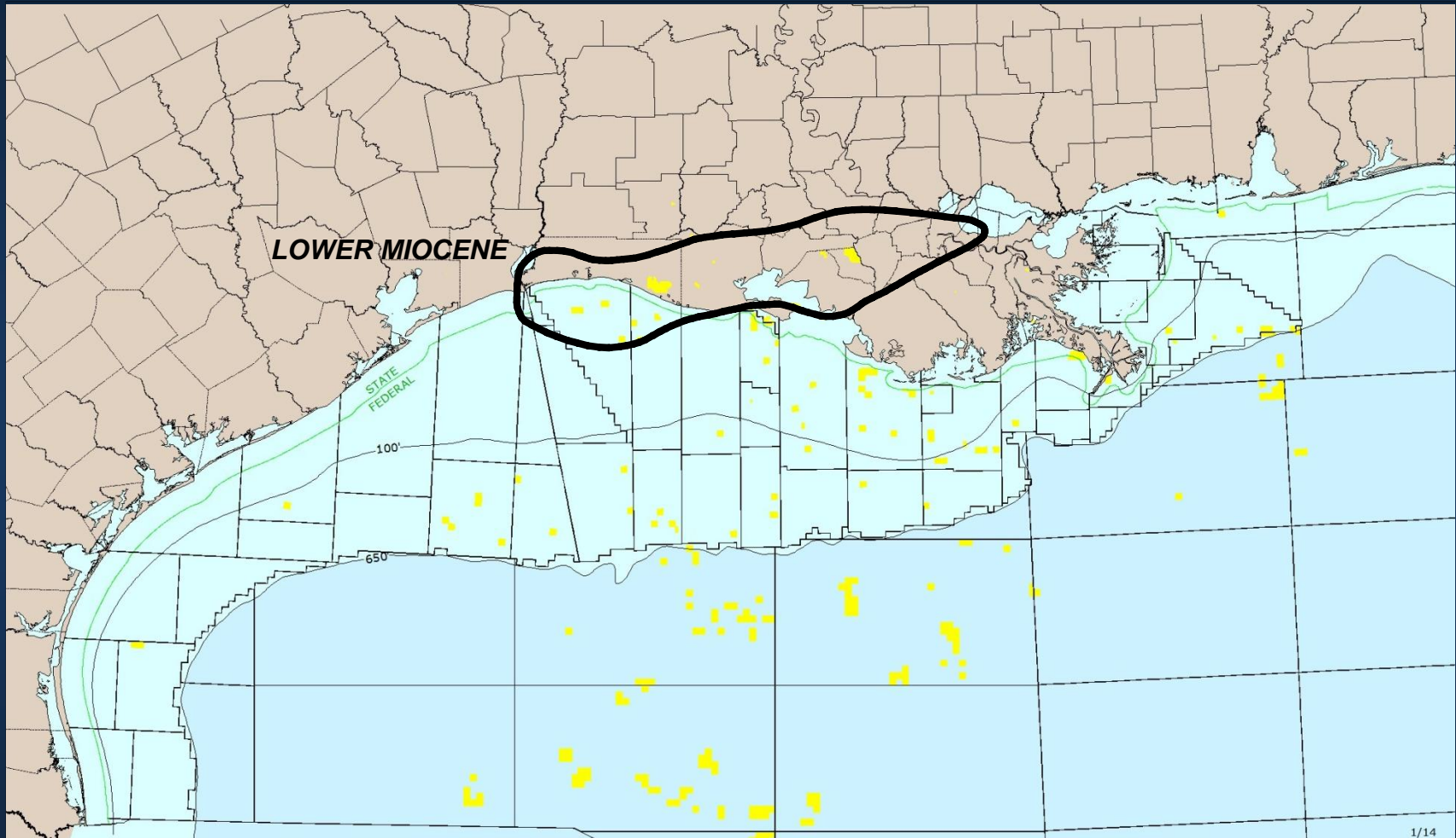


# ***How We Found the Missing Piece of the Gulf of Mexico Puzzle***





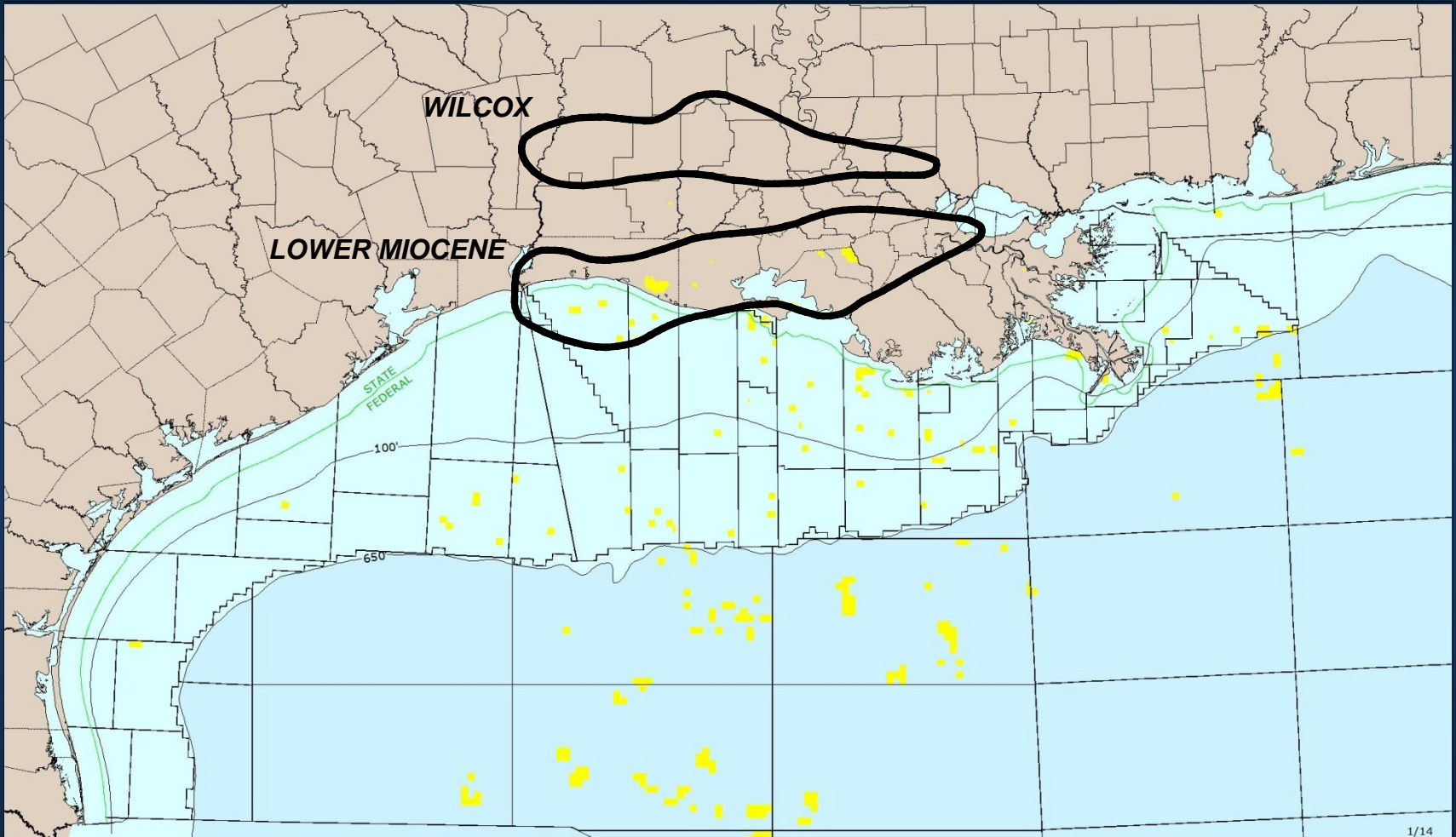
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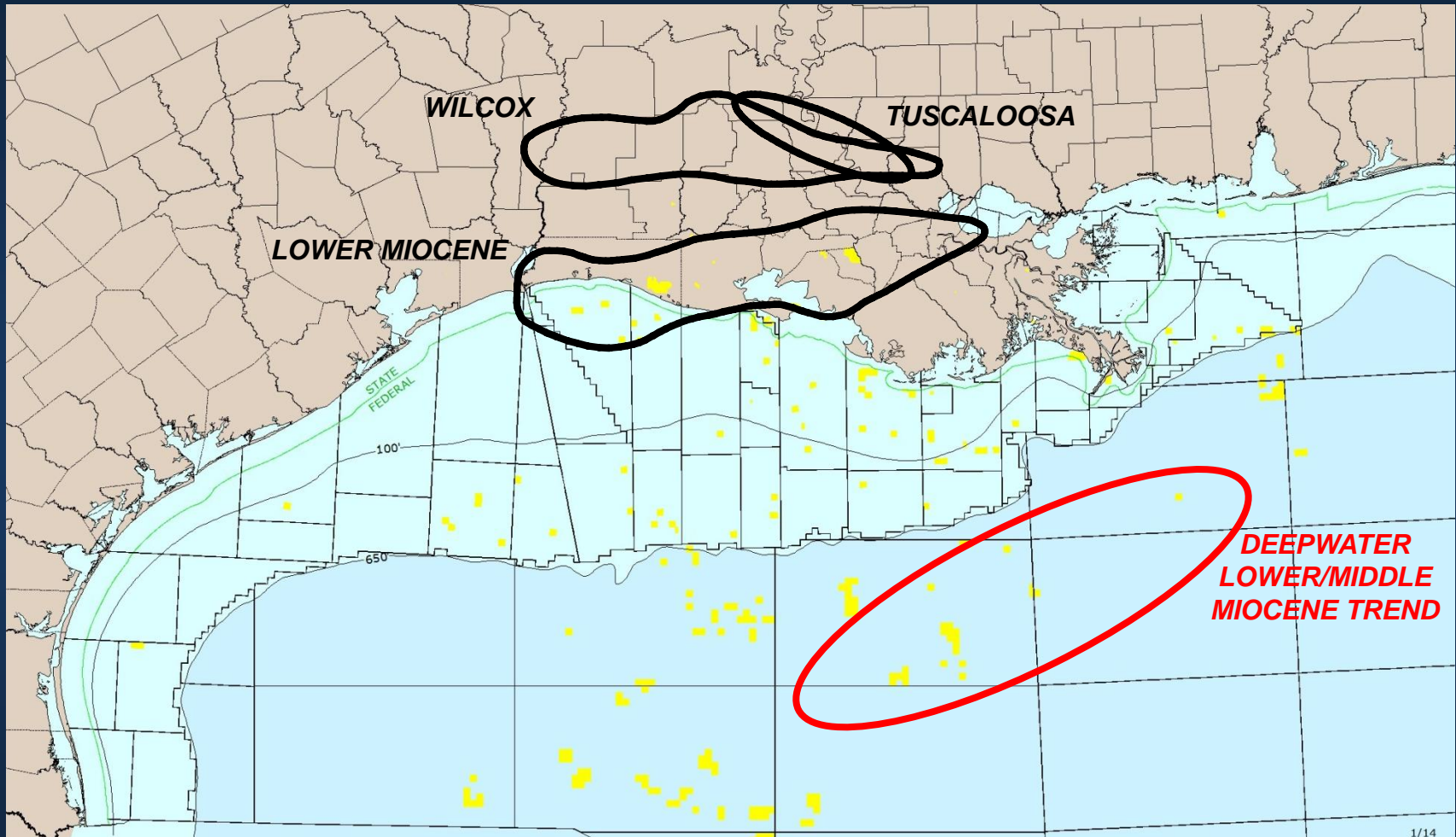
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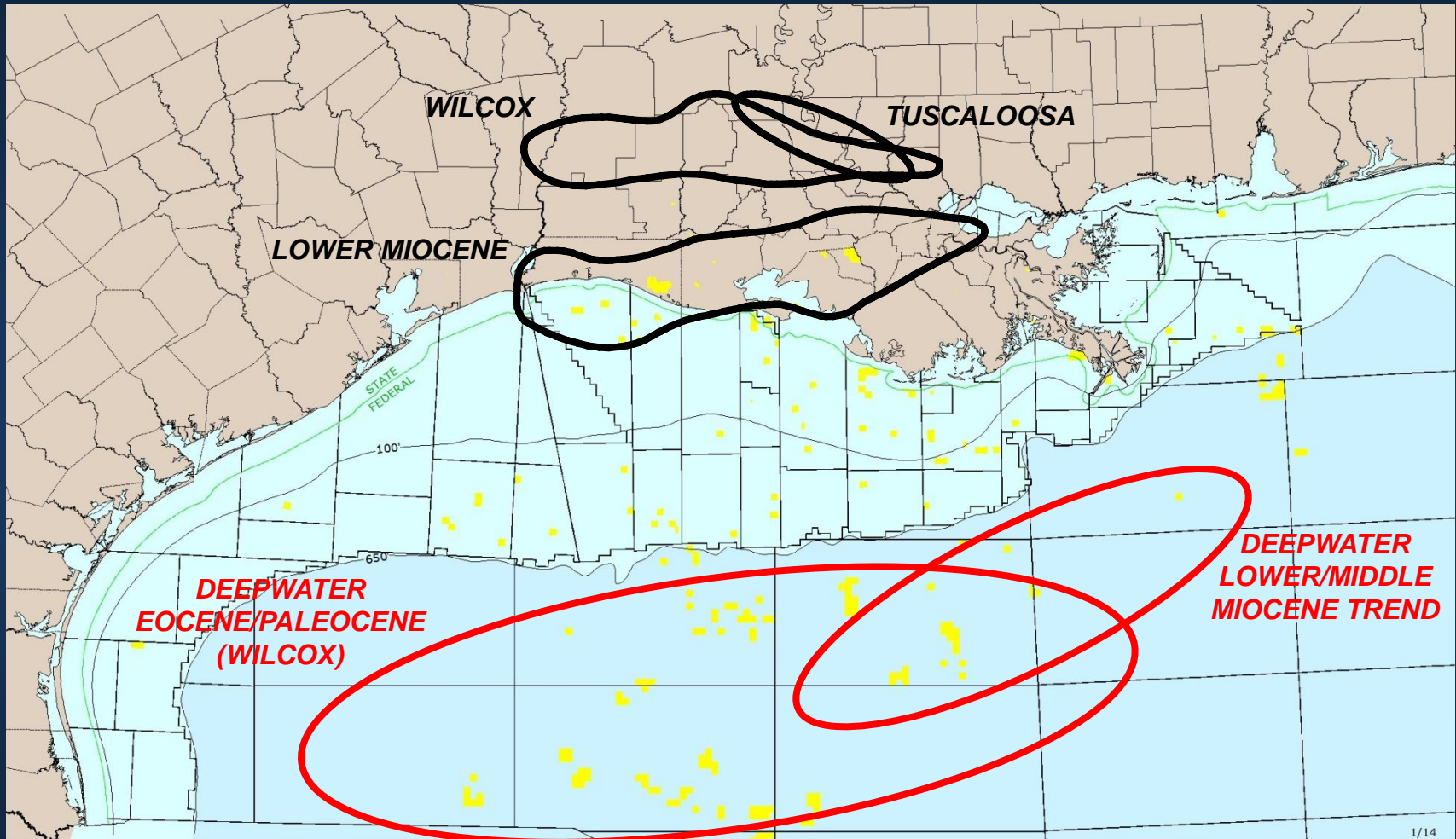
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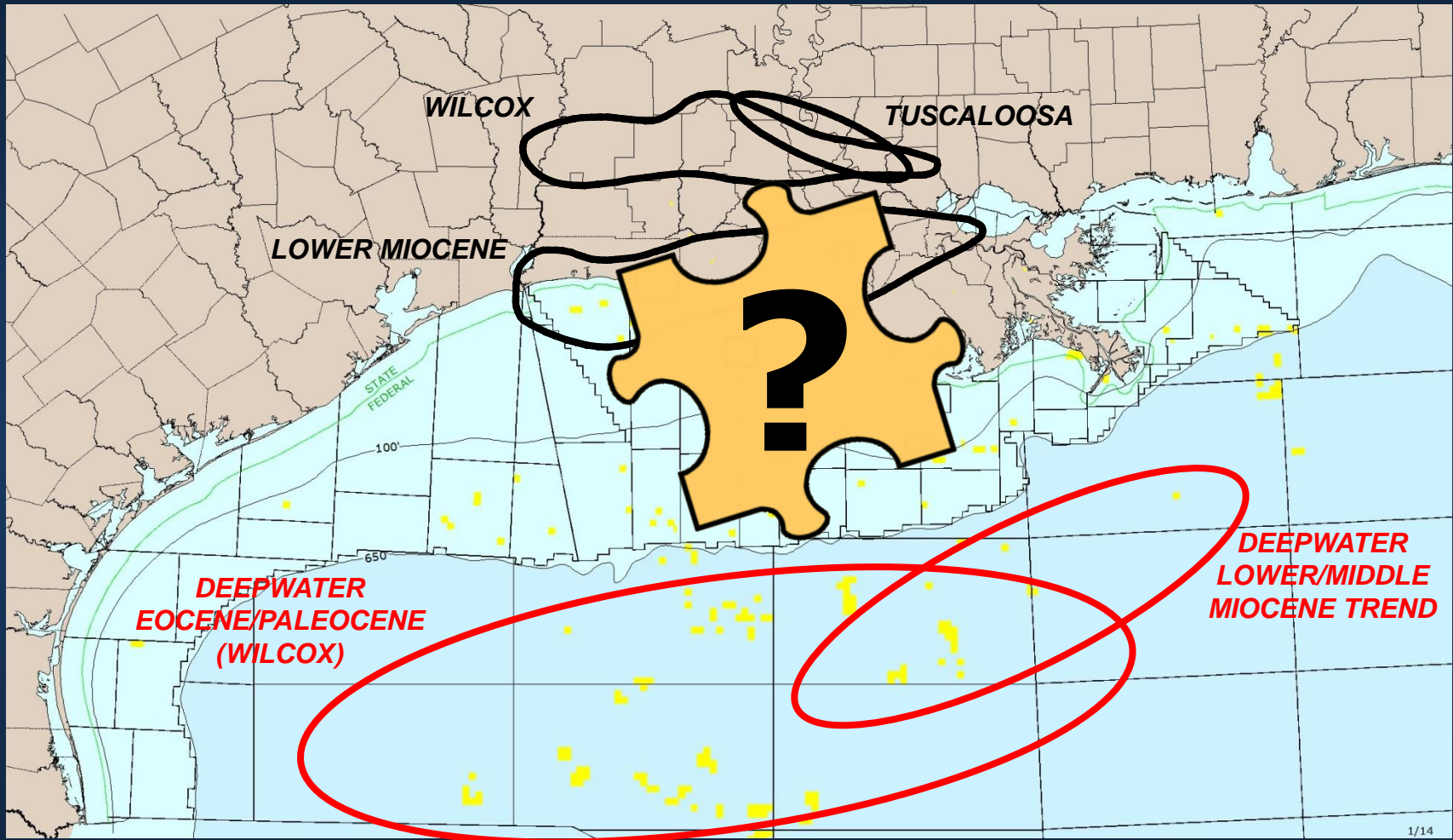


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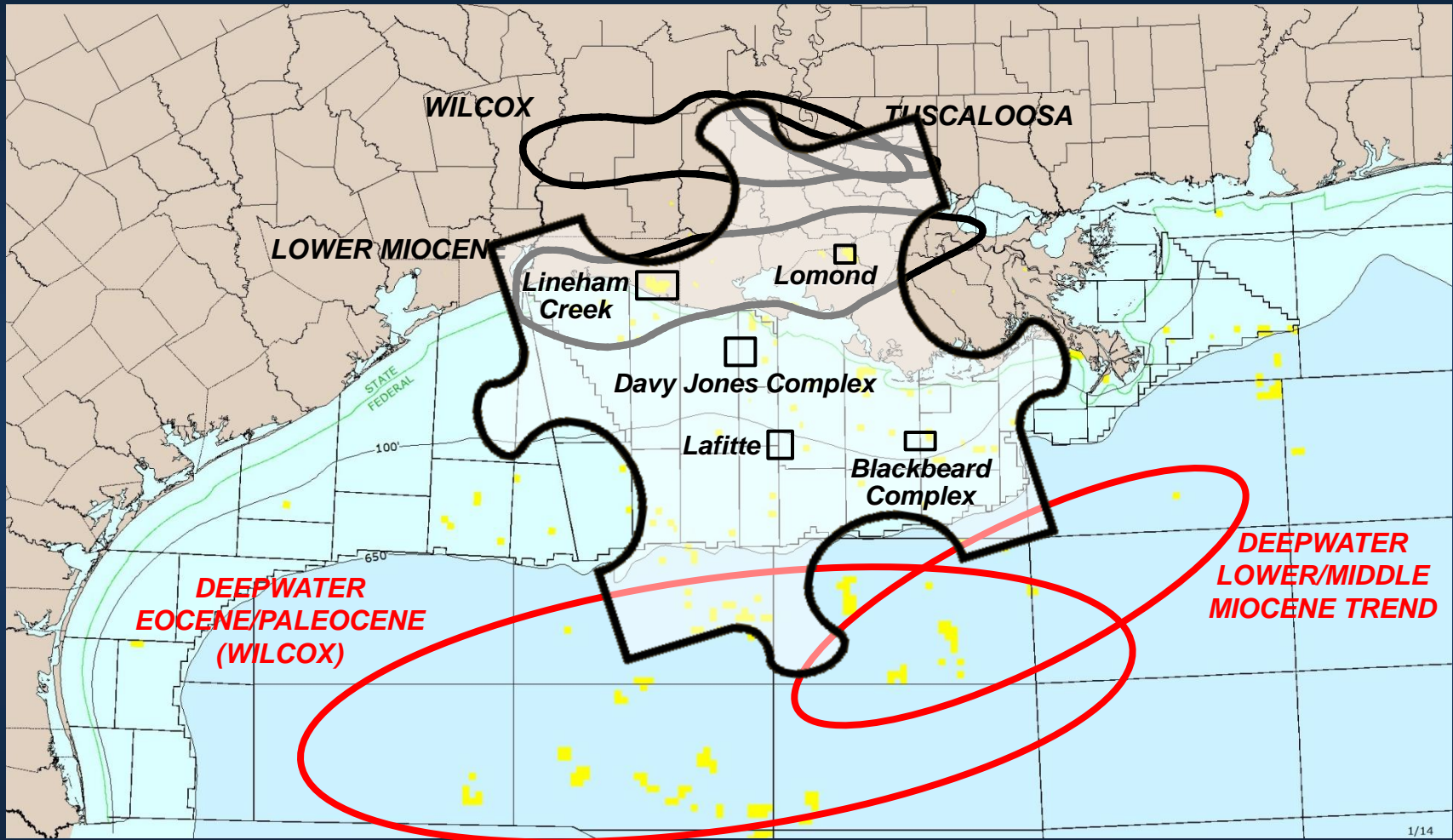
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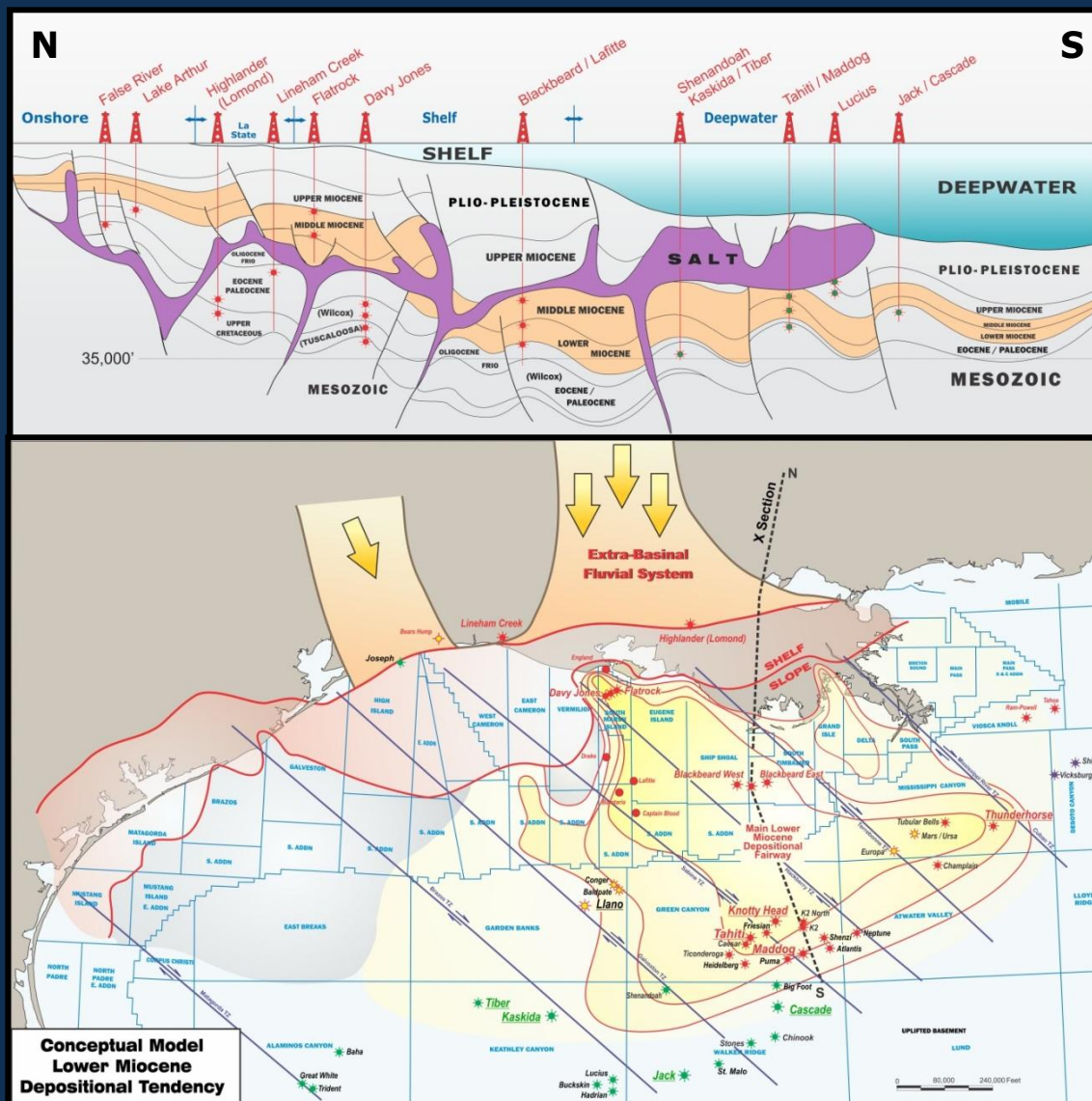


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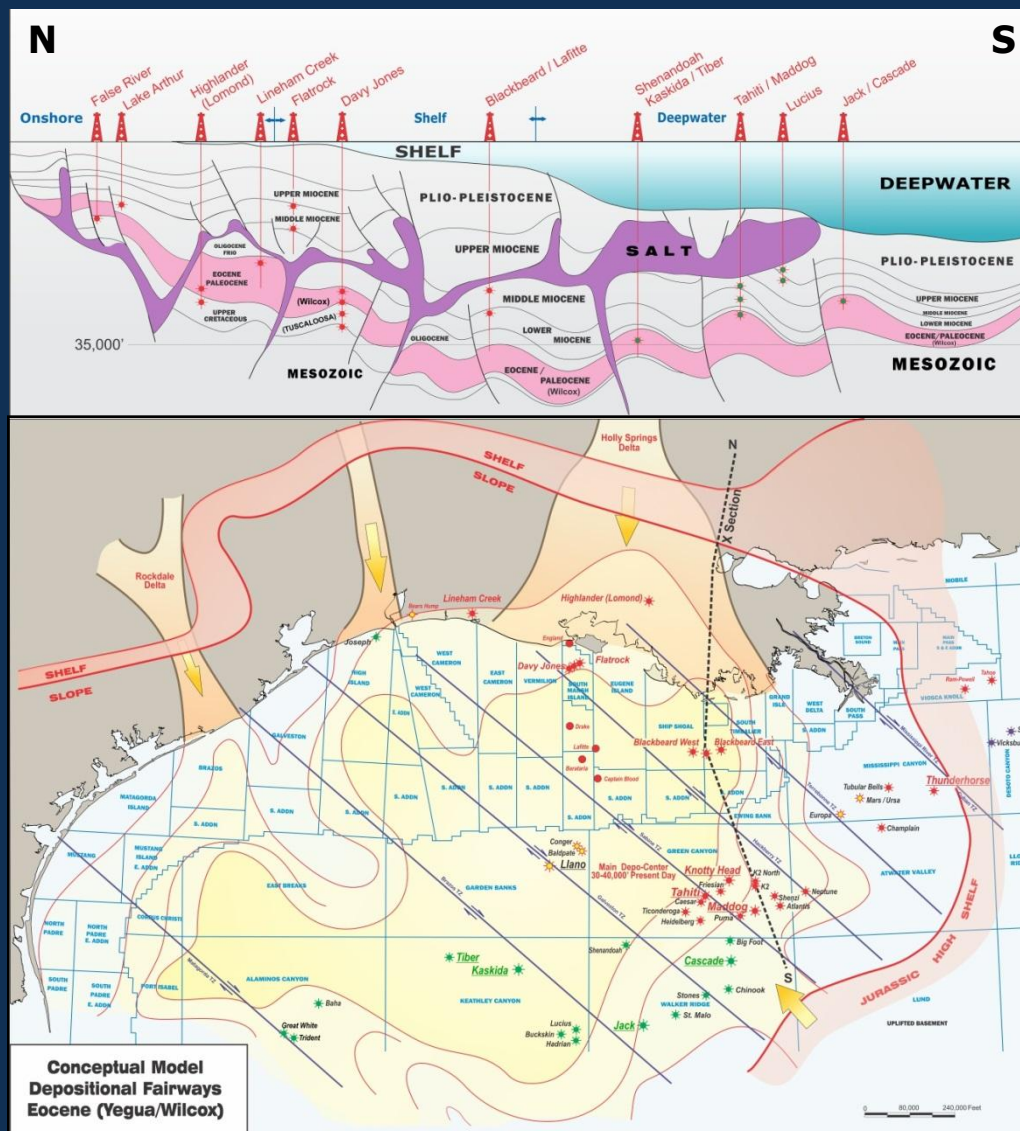


# Conceptual Model – Lower Miocene Depositional Tendency





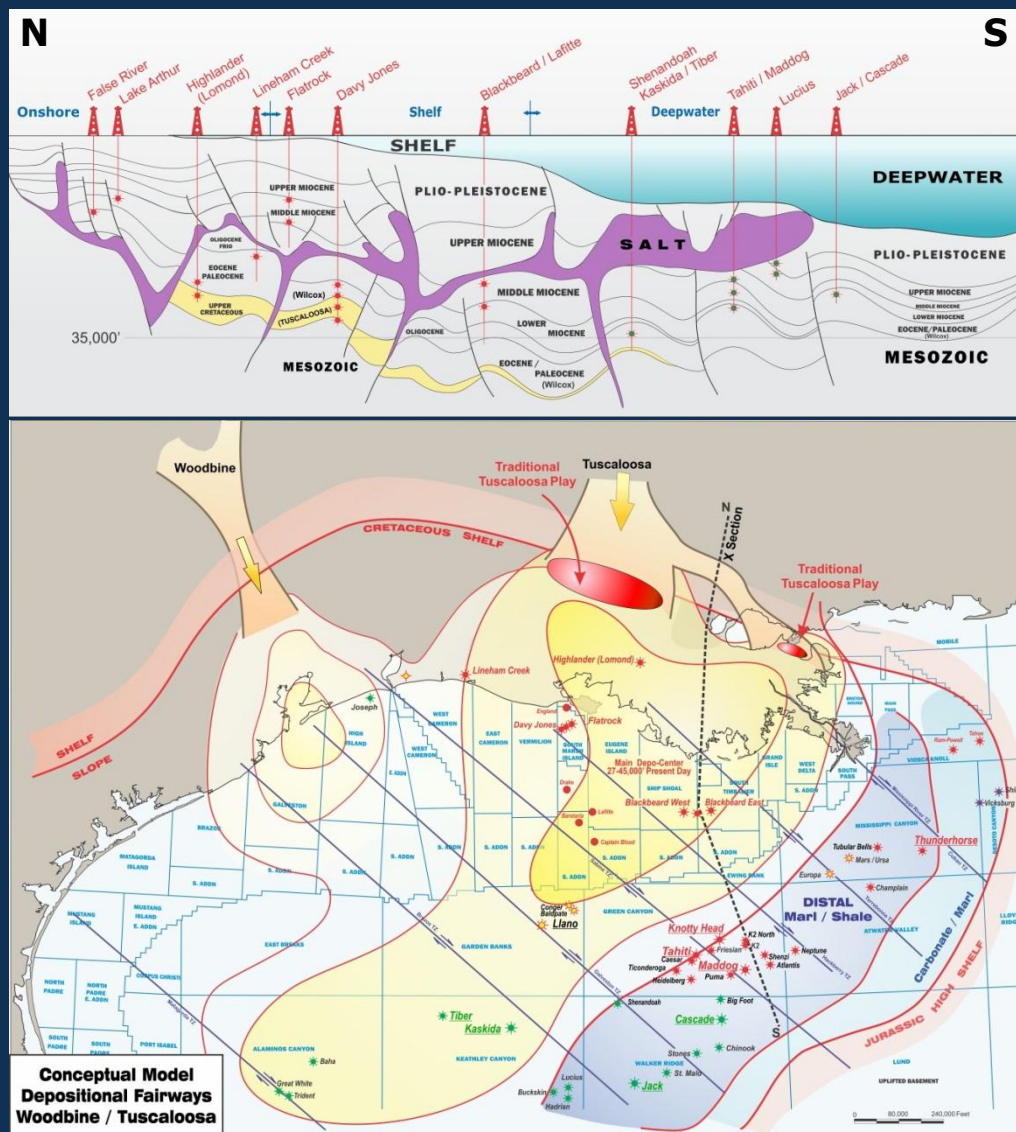
# Conceptual Model – Depositional Fairways Eocene (Yegua/Wilcox)





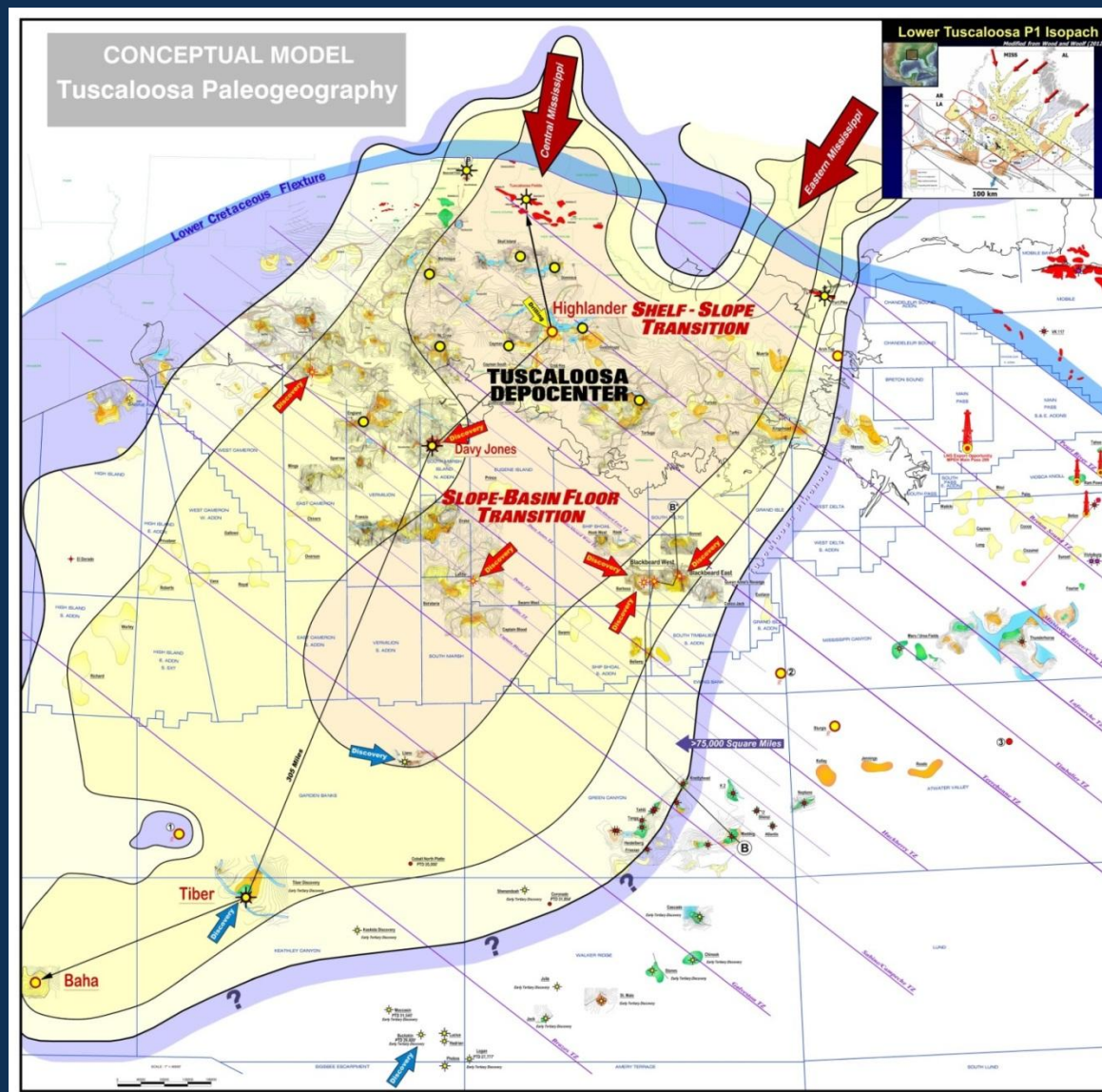


# Conceptual Model – Depositional Fairways Woodbine/Tuscaloosa





# Conceptual Model – Tuscaloosa Paleogeography







# ***Davy Jones – Major Ultra-Deep Discovery***

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## ➤ **Discovery Well**

- **Logged High Quality Wilcox Pays on Large Structure**
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## ➤ **Offset Well**

- **Confirmed Wilcox Sand Continuity 2½ Miles Away**
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