

# **Sequence and Seismic Stratigraphy of the Bossier Play (Tithonian), western East Texas Basin.**

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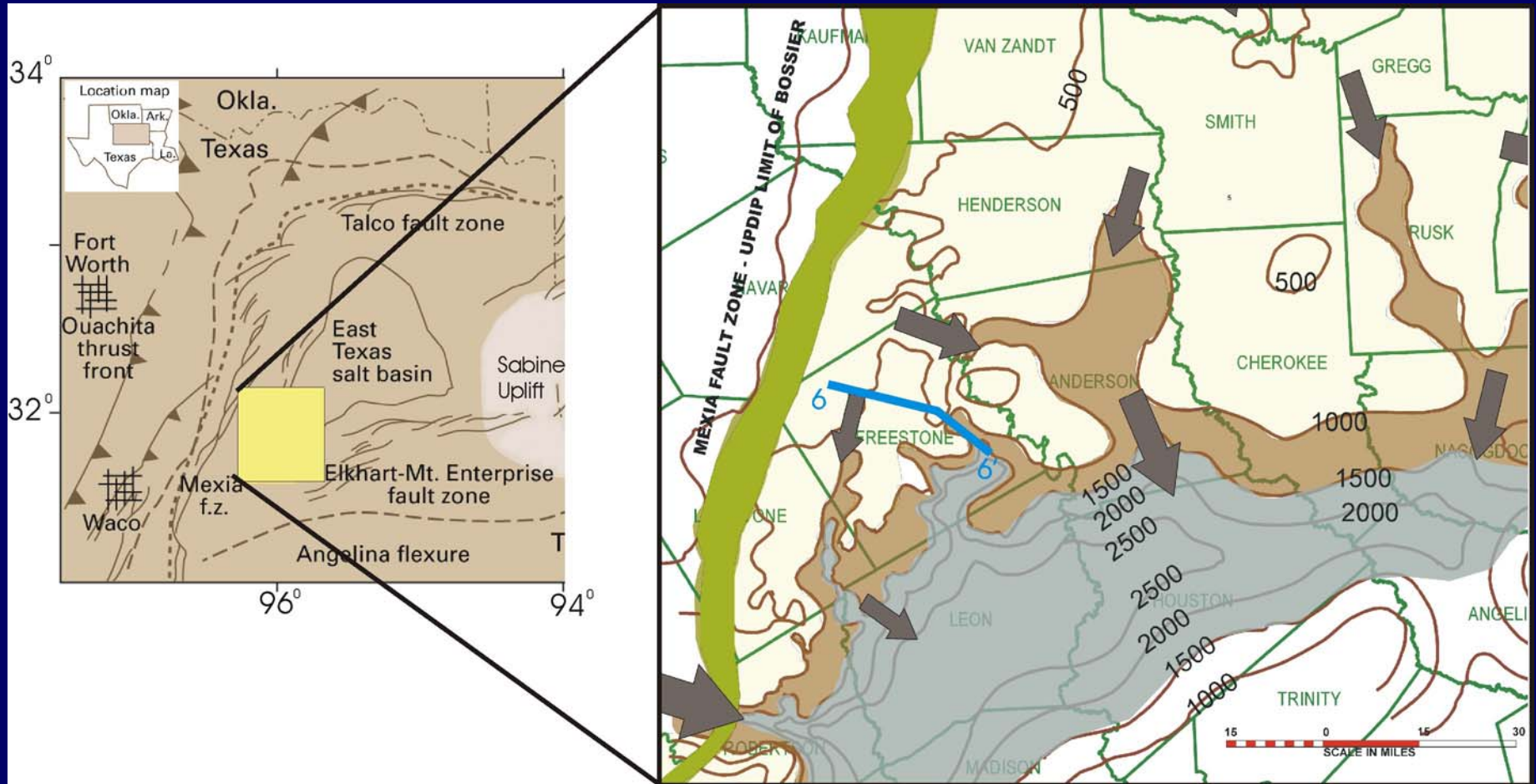
# **OBJECTIVES:**

- 1). Establish Sequence Stratigraphic Framework.**
- 2). Identify Major Sand Facies**
- 3). Map Sand Facies and Identify Potential Exploration Fairways**
- 4). Tie Stratigraphy & Facies to Basin History**

# **METHODS AND TASKS:**

- **Detailed interpretation of well-log cross-sections (13 lines, 151 wells)**
- **Detailed Analysis of 13 Seismic lines (~840 Mi.)**
- **Identify All Major Sequence Boundaries and Systems Tracts (Methods of Mitchum et al, 1995; Van Wagoner et al, 1990)**
- **Map Log Facies AND Seismic Facies**
- **Identify best prospective fairways.**

# **BOSSIER ISOPACH & INDEX MAP**

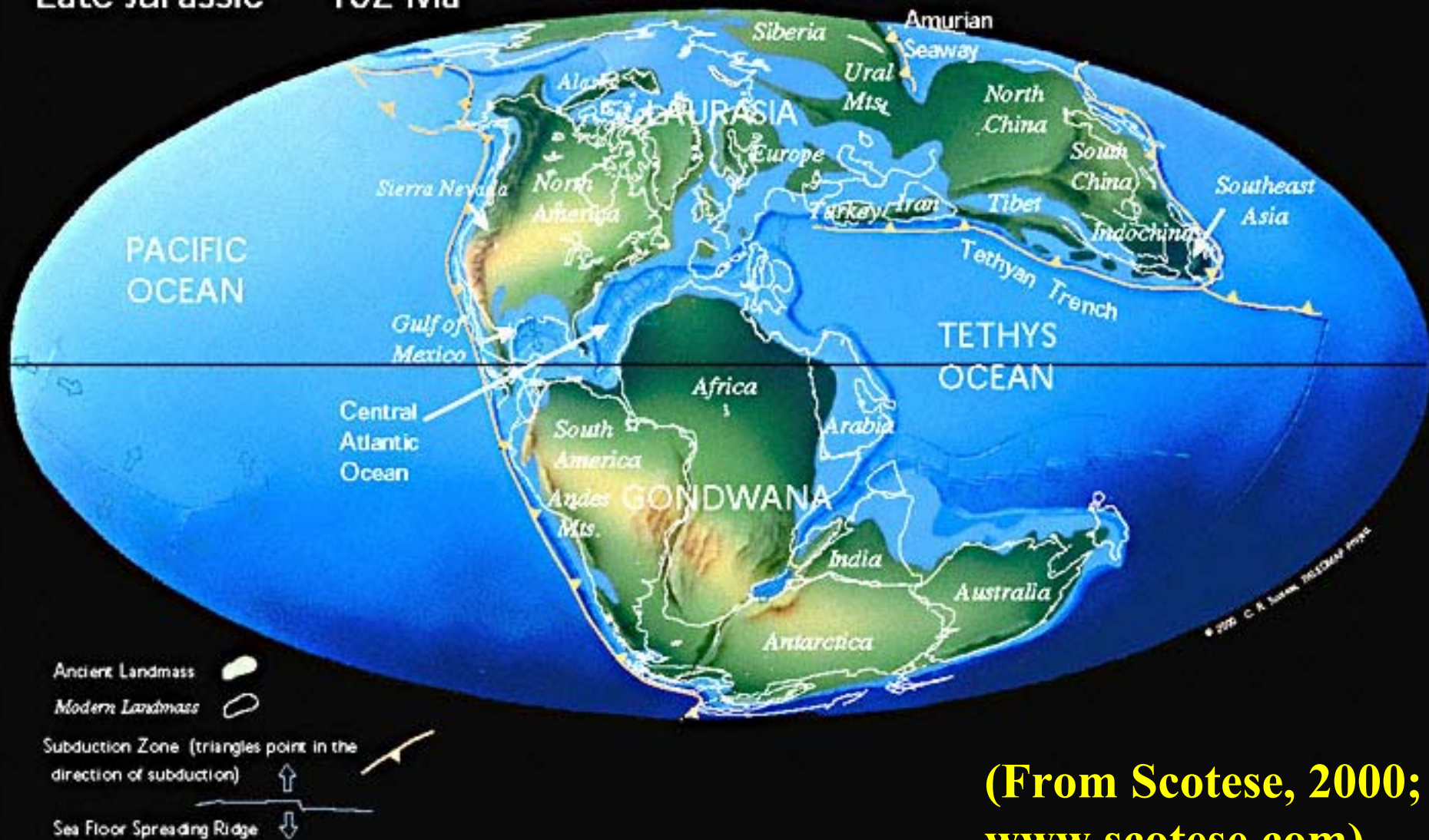


**(Left map redrawn from Montgomery & Karlewicz, 2001)**



# GLOBAL CONTEXT OF BOSSIER FM

Late Jurassic 152 Ma

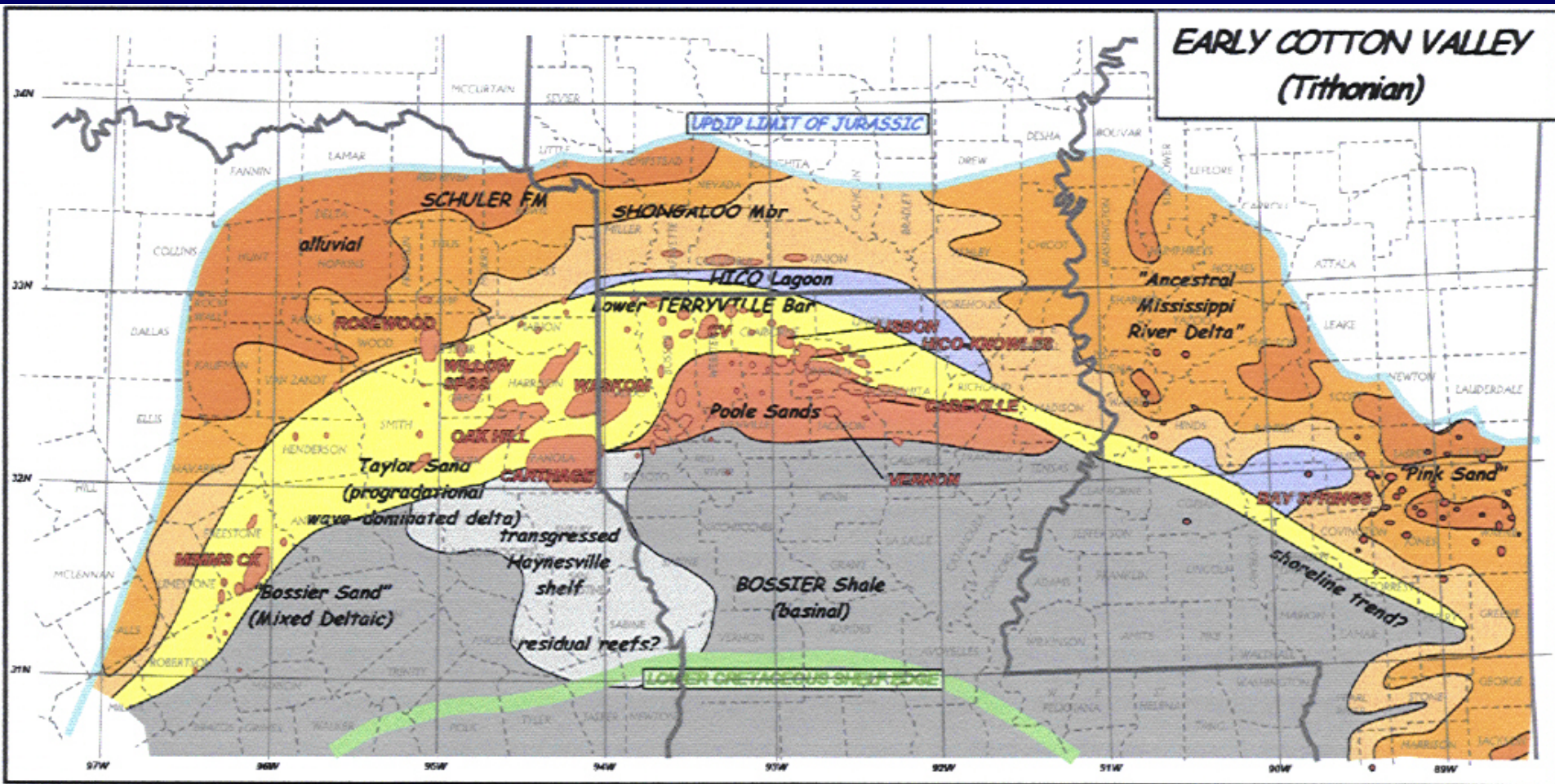


# **BOSSIER TIME: Characteristics**

- **Global High Stand of Sea Level (Kimmeridgian)**
- **Time of Generation of Major Source Beds**
- **Tropical/Humid Paleoclimate**
- **Deep Weathering – Shale Dominated System;  
Bossier – Low net/gross sand**



# BOSSIER FACIES



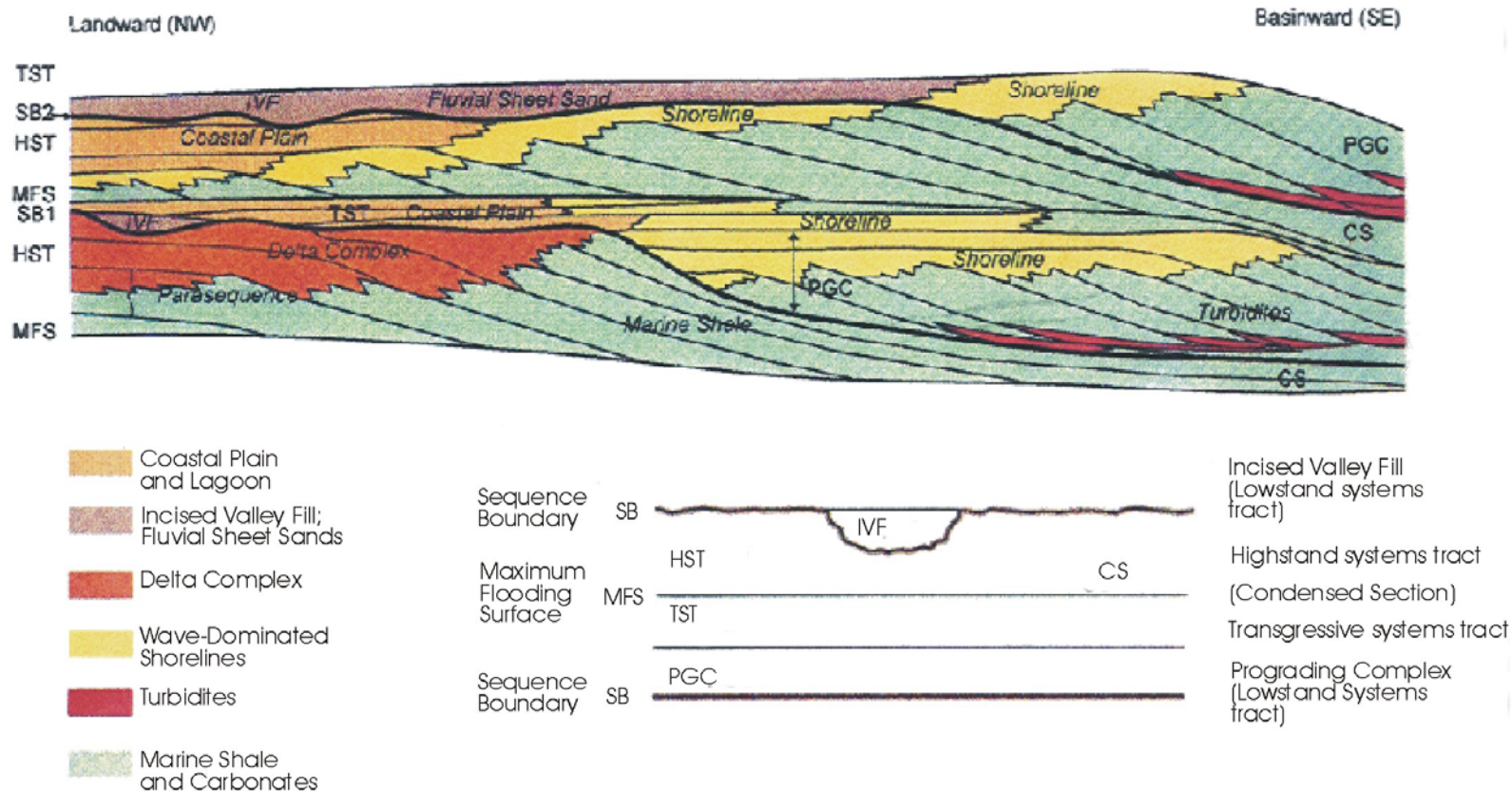
**Figure 5.** Map of depositional systems, early Cotton Valley (Tithonian). Data sources include: in north Louisiana, Forgotson (1954), Anderson (1979), and Coleman and Coleman (1981); in Mississippi, Moore (1983); in east Texas, Coleman (1985), Wescott (1985), McGowen and Harris (1984), and unpublished data. (See Fig. 3 caption for color-coding.)

(from Ewing, 2001; his fig.6)



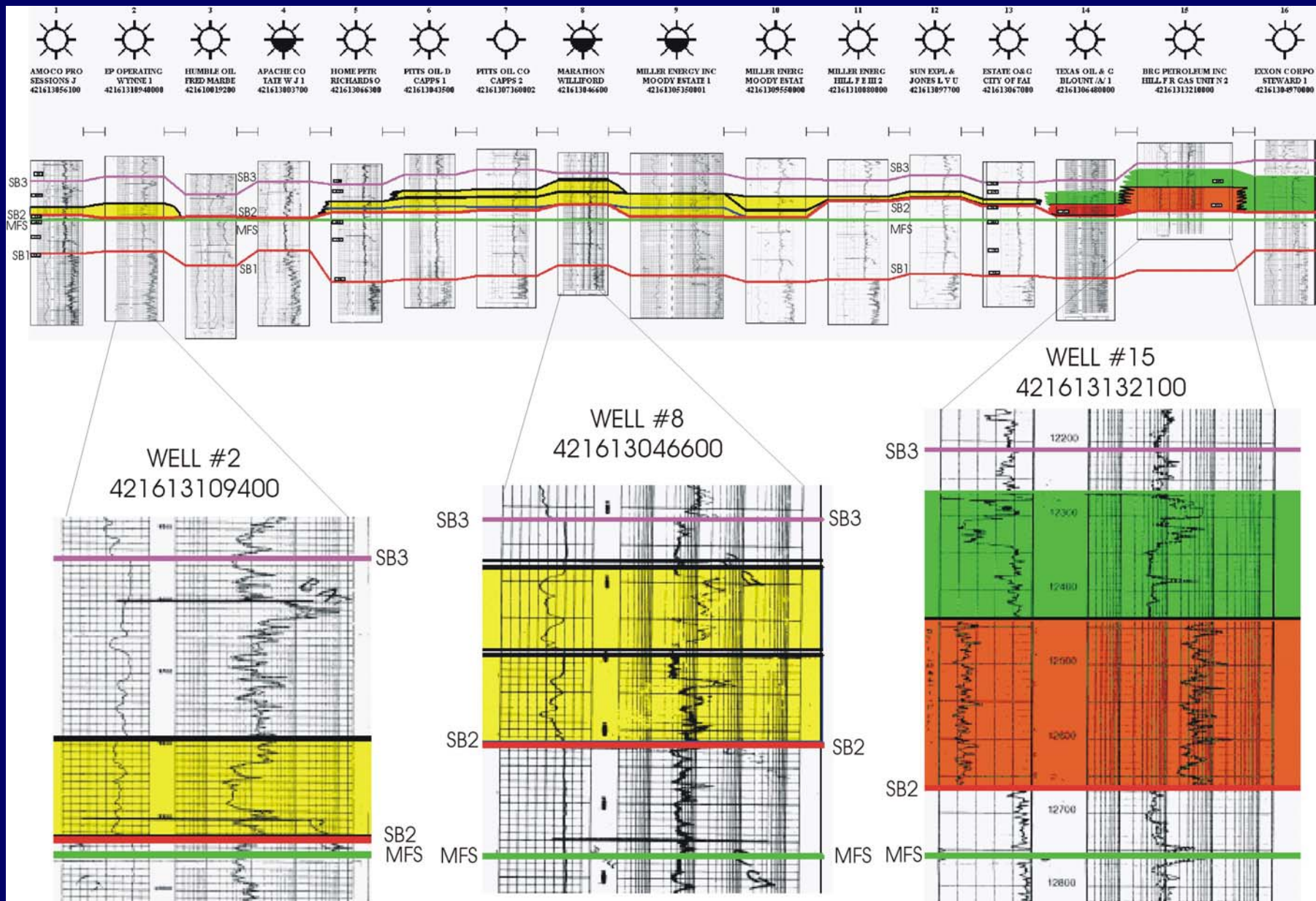
L. Cret	Basinward →	
Upper Jurassic	Cotton Valley Group	Travis Peak
		Schuler
		Cotton Valley SandStone
	Louark Gp	Bossier
		Haynesville
		(Gilmer) Cotton Valley Lime
Middle Jurassic	Louann Gp	Buckner
		Smackover
		Norphlet
		Louann Salt
U. Trias		Warner
Paleozoics		

# BOSSIER STRATIGRAPHY: Two approaches

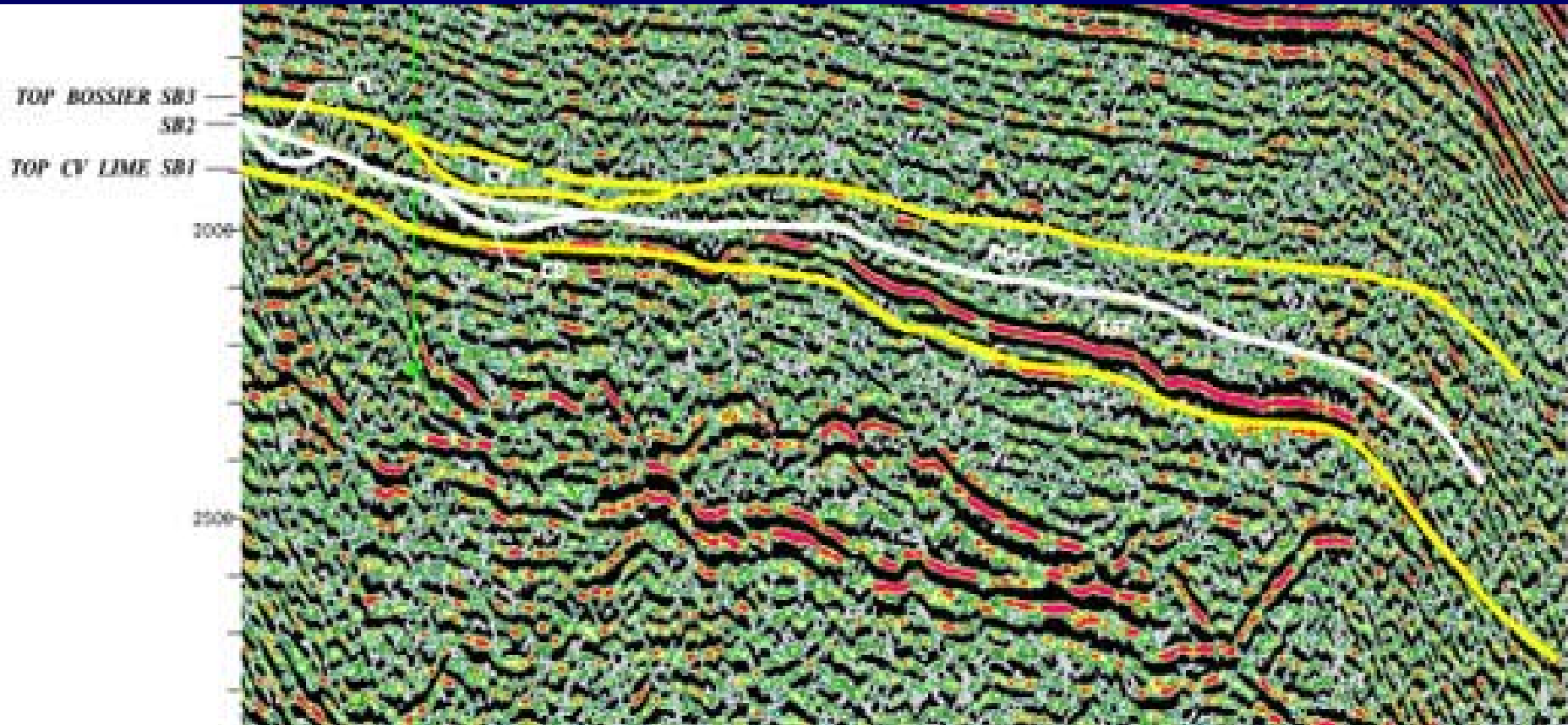


(Left redrawn from Montgomery & Karlewicz, 2001; Right from Williams and Mitchum, 1997; their fig. 7)

# WELL LOG CROSS-SECTION #6



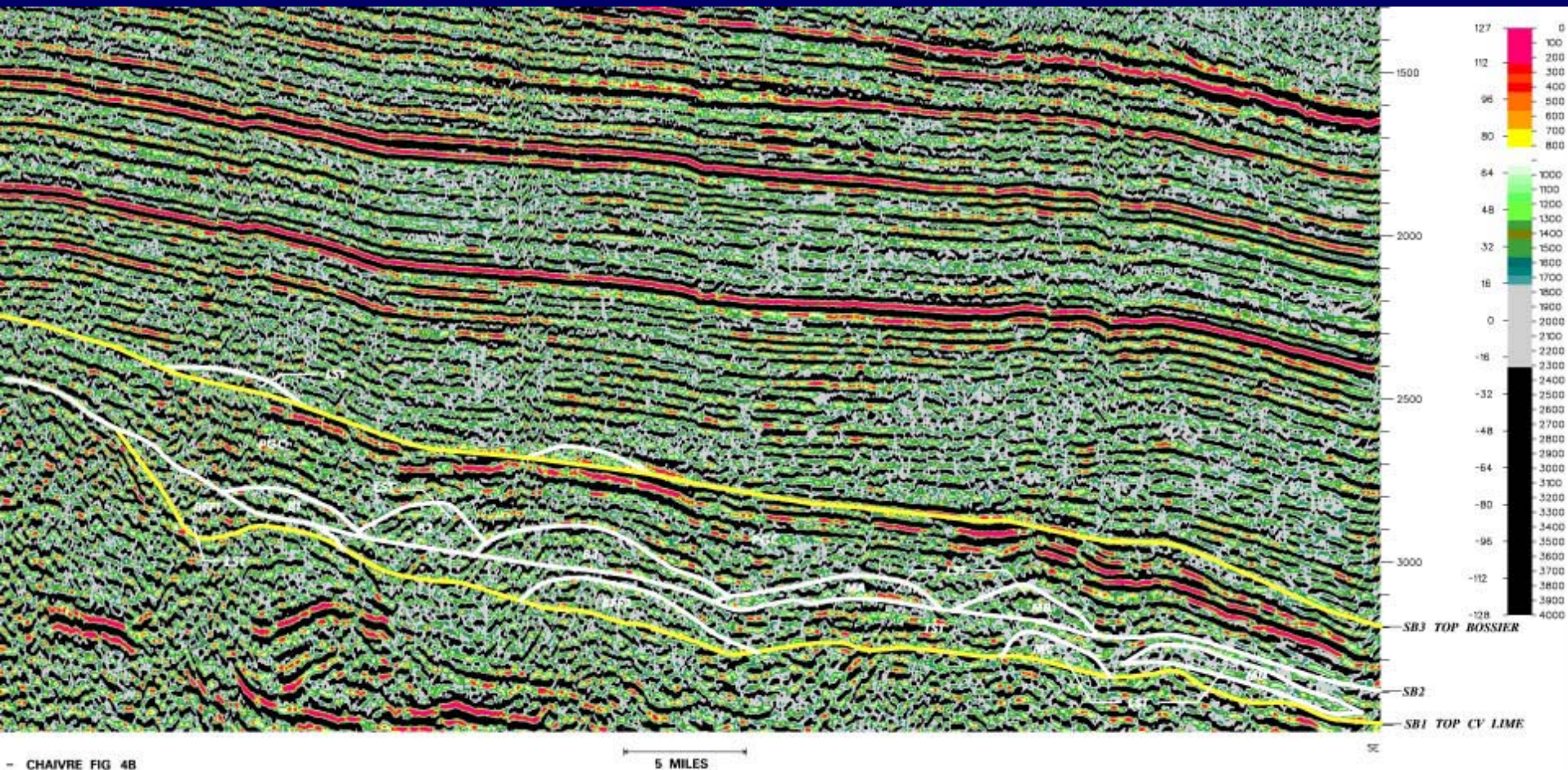
# Seismic Dip Line (*up-dip end*)



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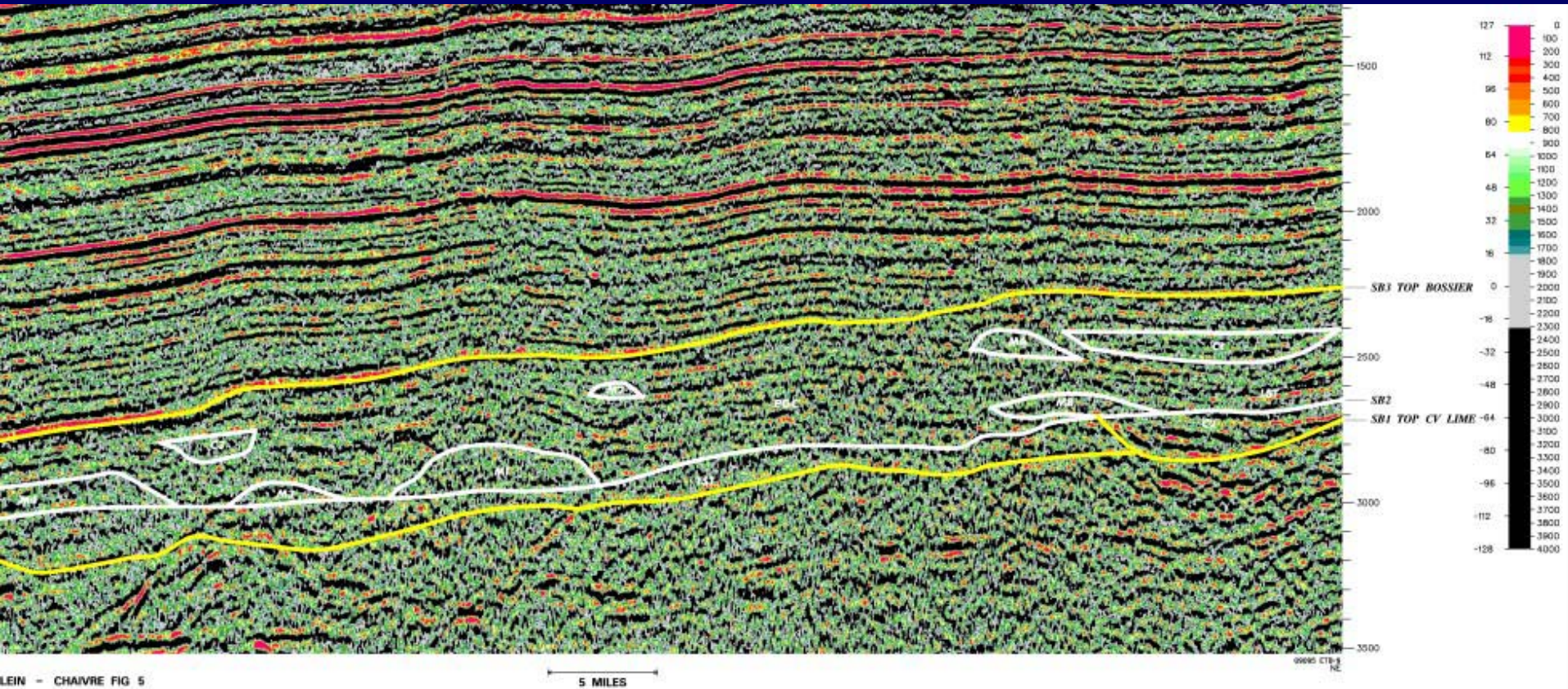
# Seismic Dip Line (*down-dip end*)



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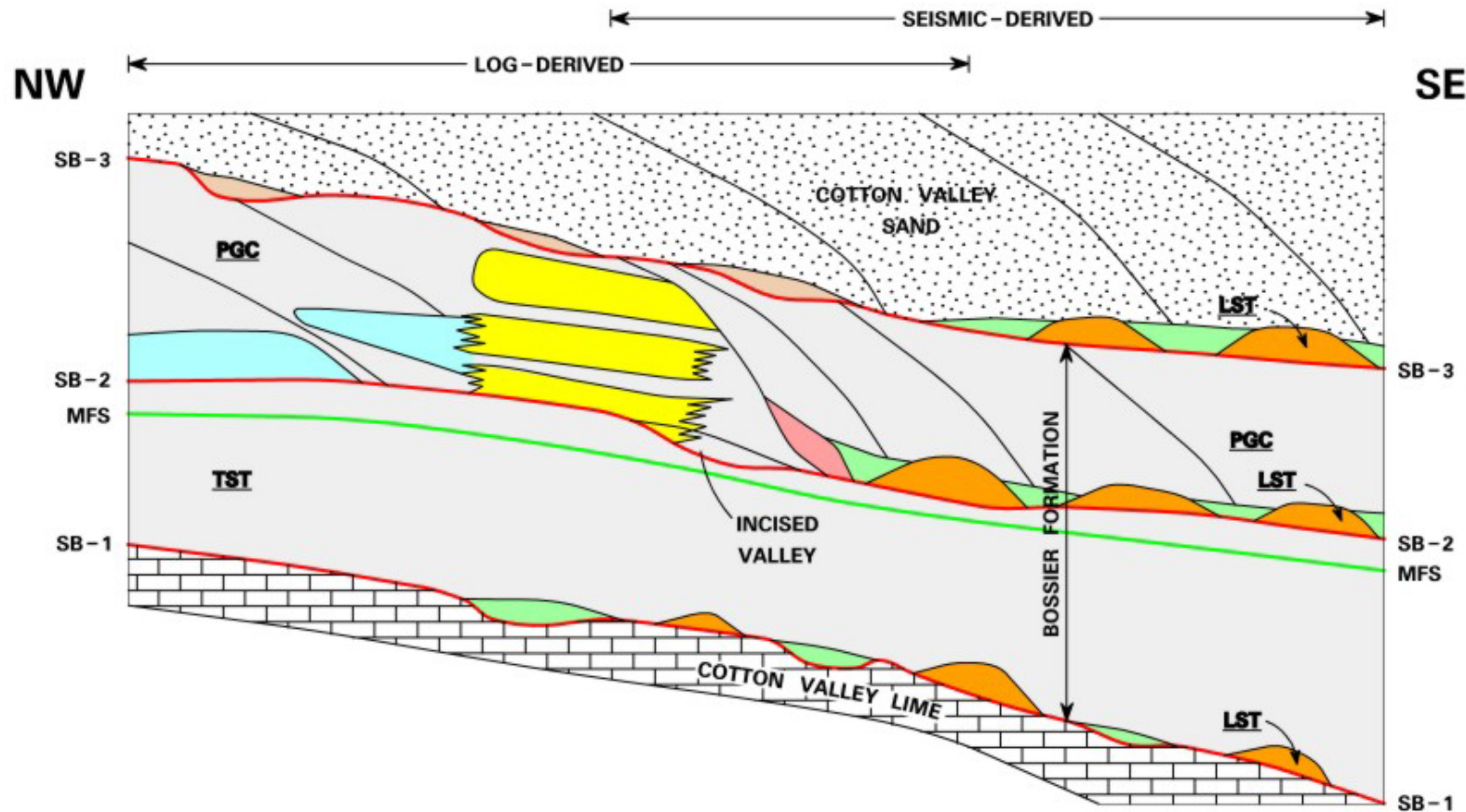
# Seismic Strike Line



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# BOSSIER FORMATION SEQUENCE STRATIGRAPHIC MODEL EAST TEXAS BASIN

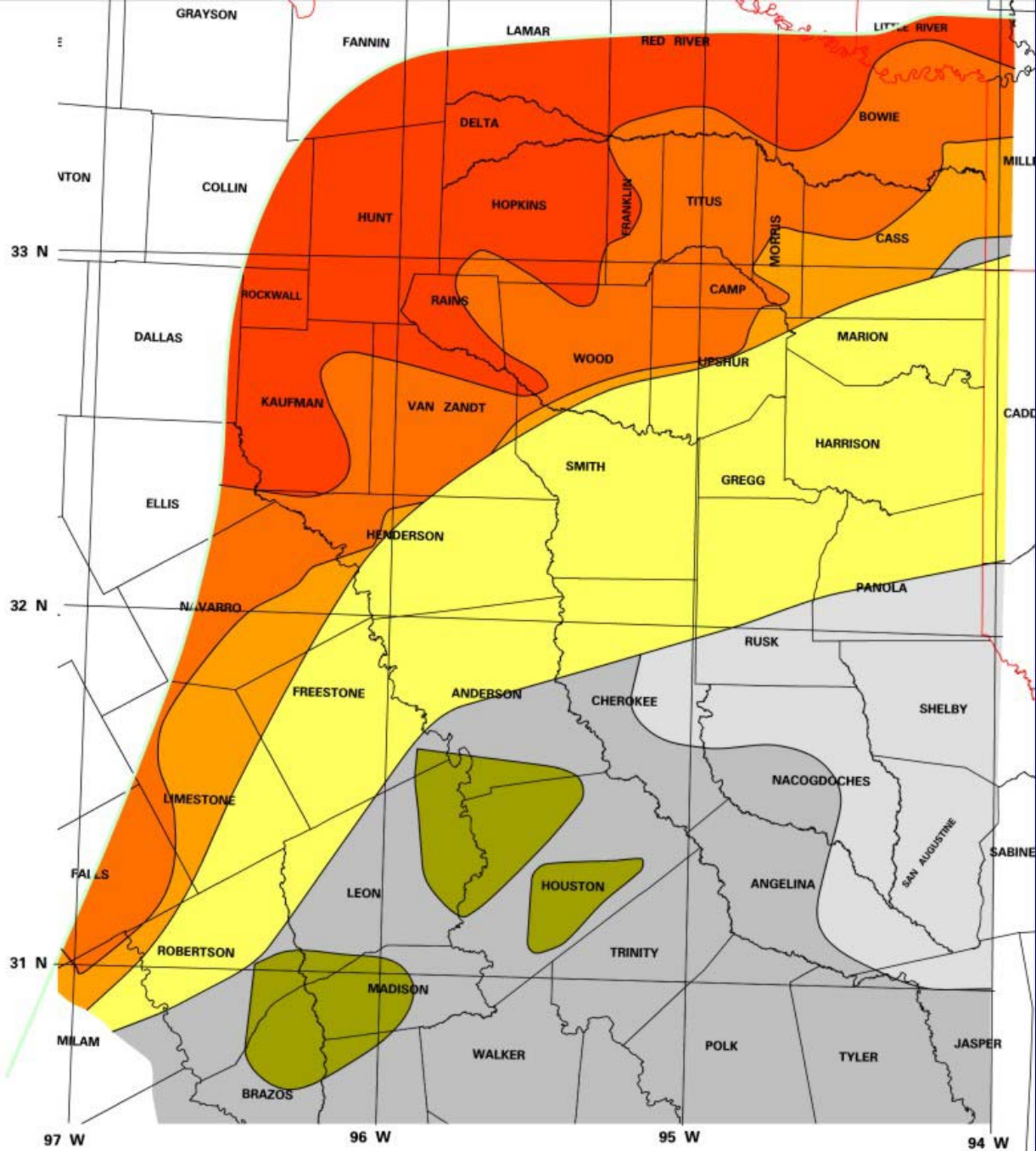


— SEQUENCE BOUNDARY (SB)  
— MAXIMUM FLOODING SURFACE (MFS)

BASIN FLOOR FAN  
 SLOPE FAN  
 LEVEE/CHANNEL COMPLEX

SHELF-EDGE DELTA  
 CHANNELS  
 DELTA (INNER SHELF)

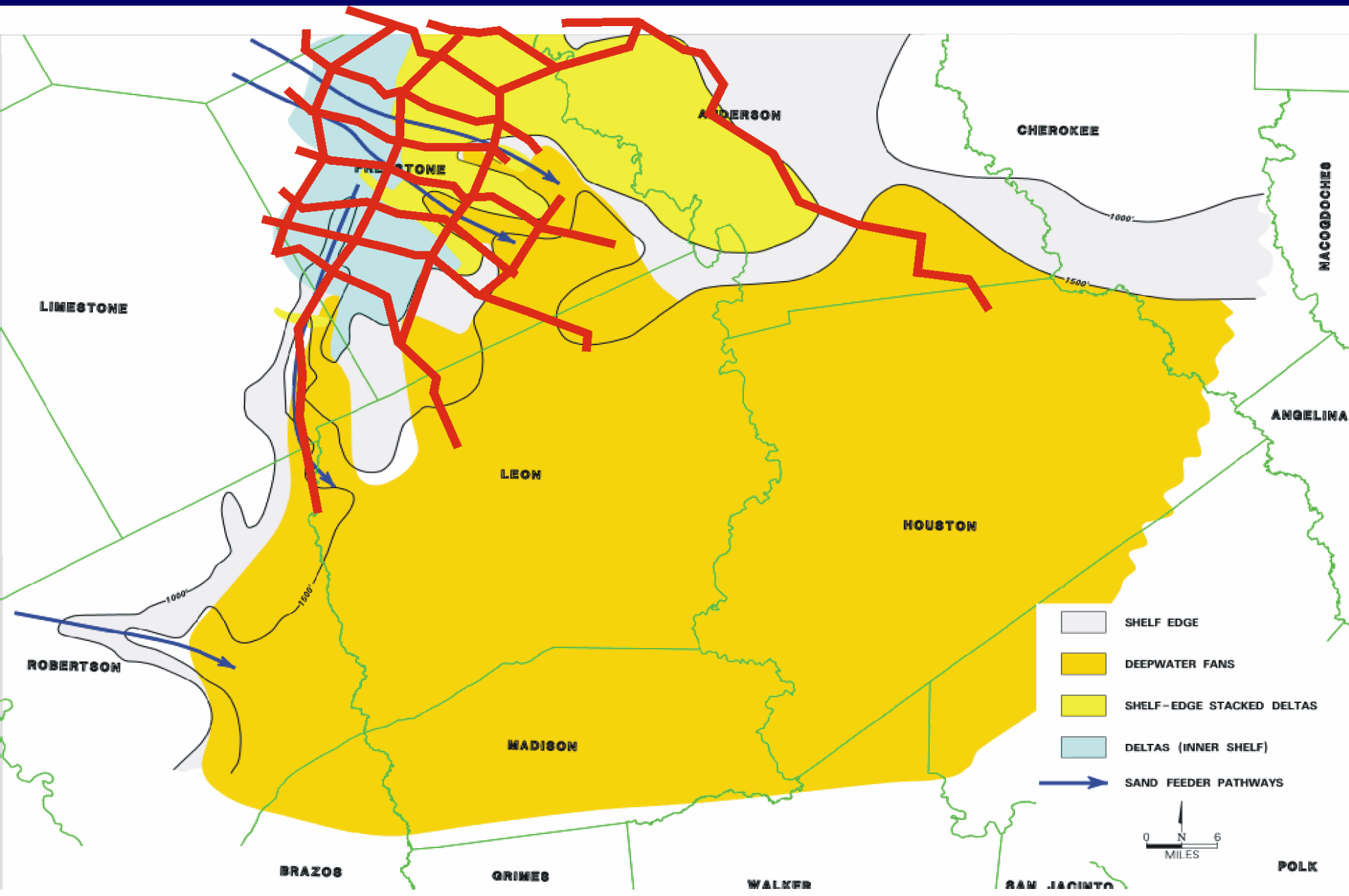
**PGC** PROGRADING COMPLEX  
**TST** TRANSGRESSIVE SYSTEM TRACT  
**LST** LOW-STAND SYSTEM TRACT



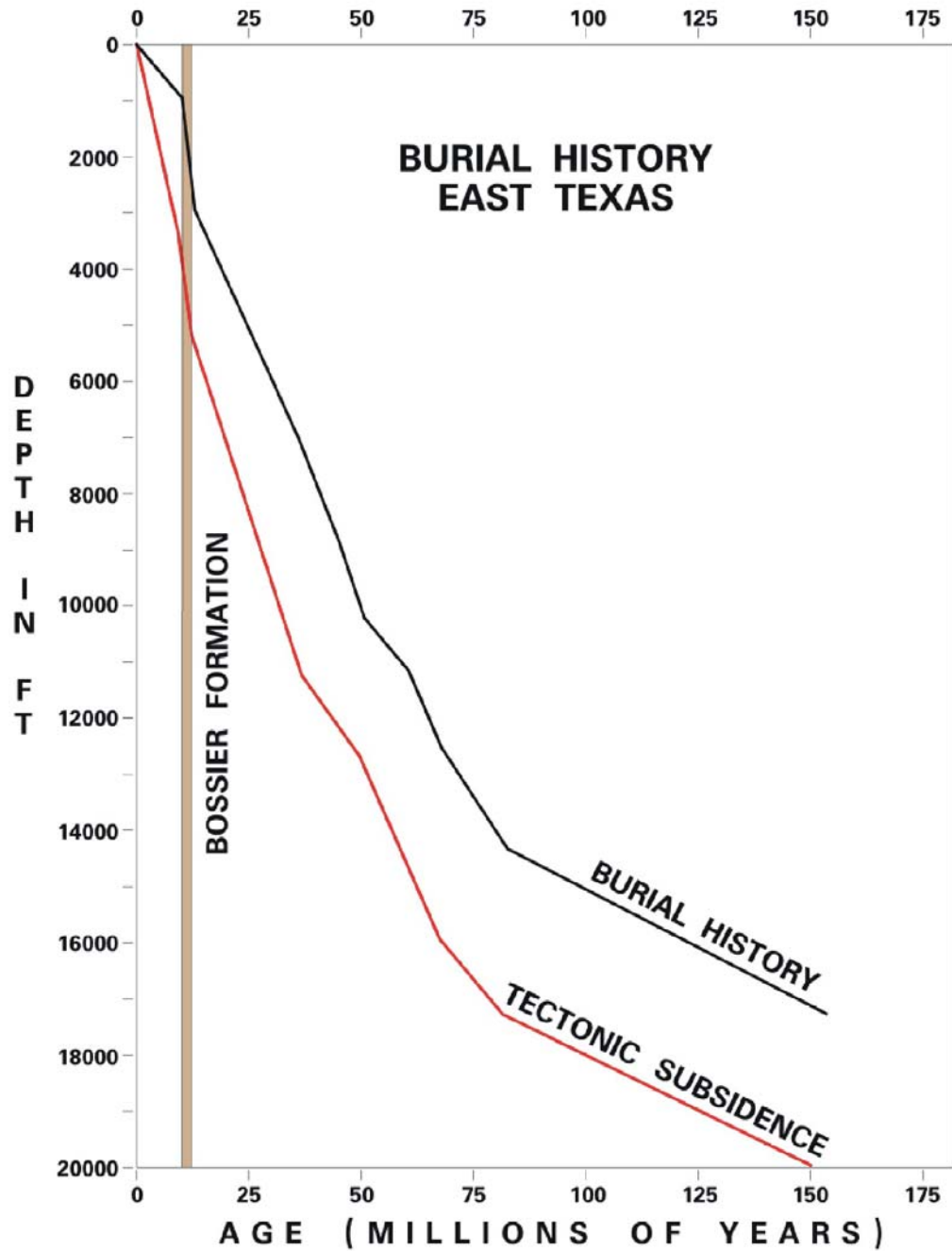
KLEIN - CHAIVRE FIG 6

(Modified  
From  
Ewing,  
2001)

# BOSSIER DEPOSITIONAL UNITS & PLAY MAP







# **BASIN INFLUENCE: Burial History Data**

- **Bossier deposited during time of rapid mechanical subsidence.**
- **Deposition could not keep up with subsidence until sea level dropped (SB-2).**
- **PGC during time when deposition kept up with or exceeded subsidence rate.**
- **SB-2 may signify possible climate change favoring influx of sand.**



# GENERAL CONCLUSION

**In Mud-dominated systems, a drop in sea level will extend fluvial systems basinward. An associated change in climate is the Driver that disperses sand into such settings.**

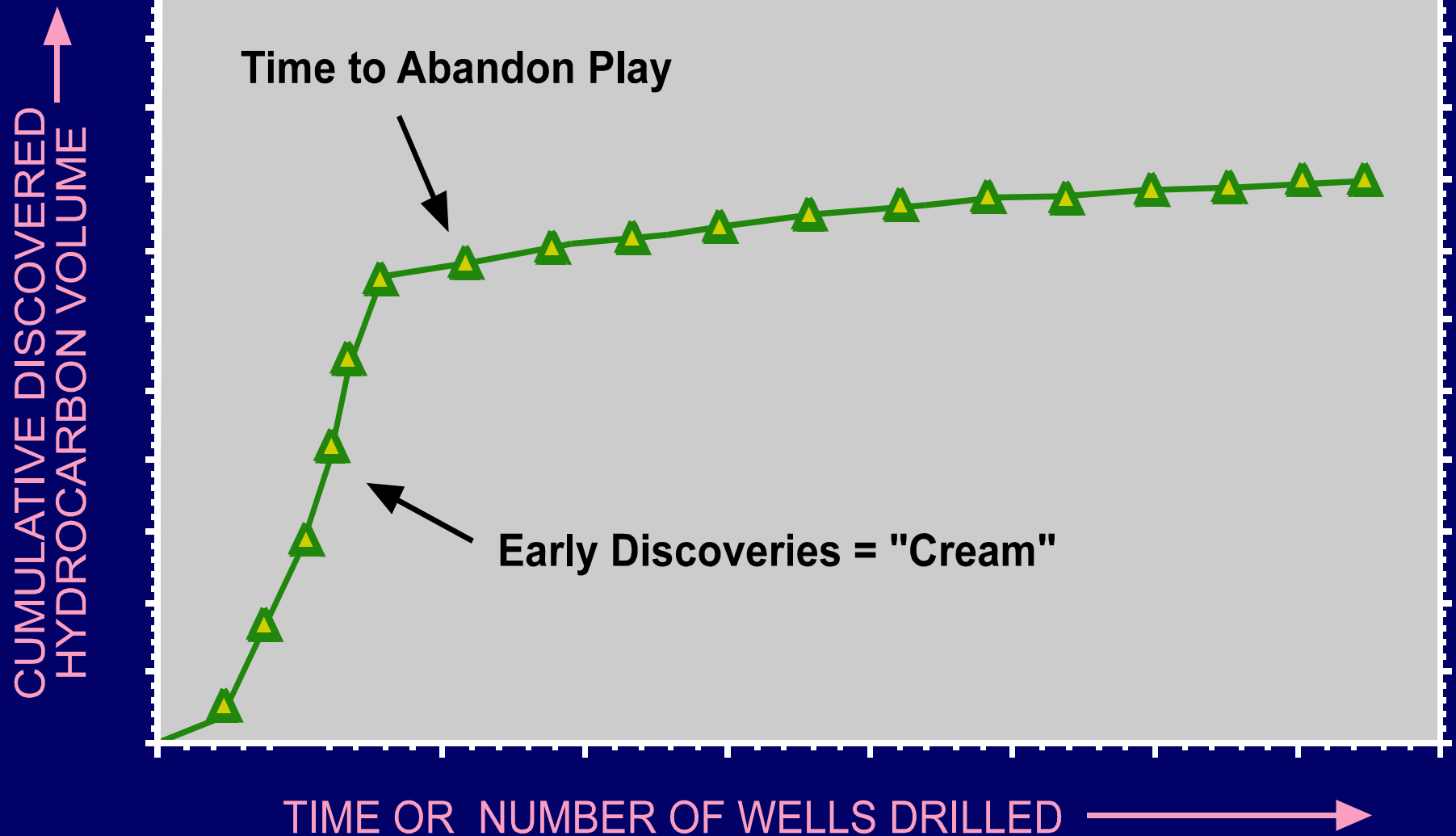
**The exploration potential of this finding opens up many new sandy reservoir possibilities in mud-dominated systems.**



# FUTURE OF BOSSIER PLAY??????

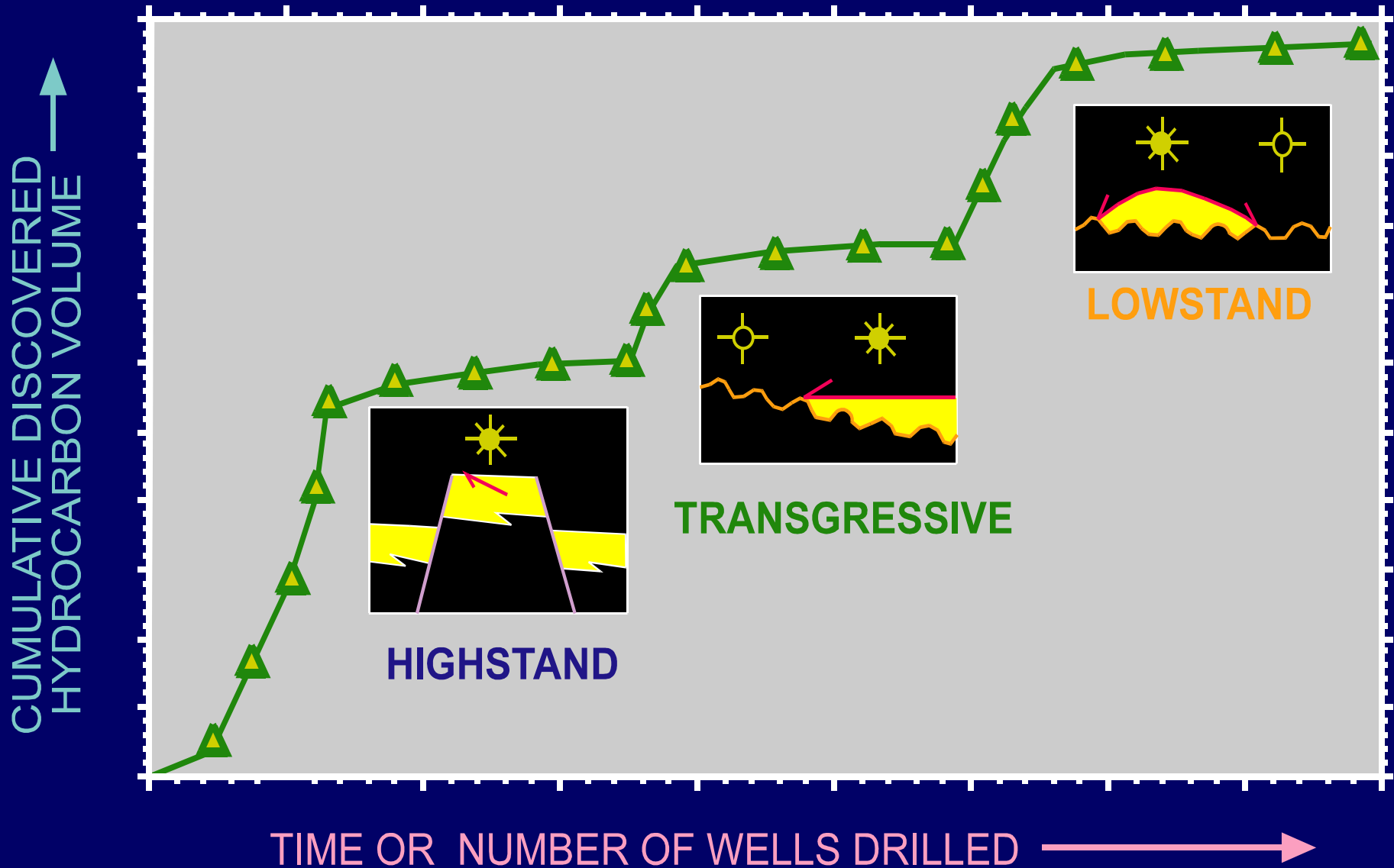
- Price: > \$4.00 to \$4.50
- Acreage Costs
- Engineering at depths > 19,000'
- Creaming Curves.

# Conventional Discovery Curve



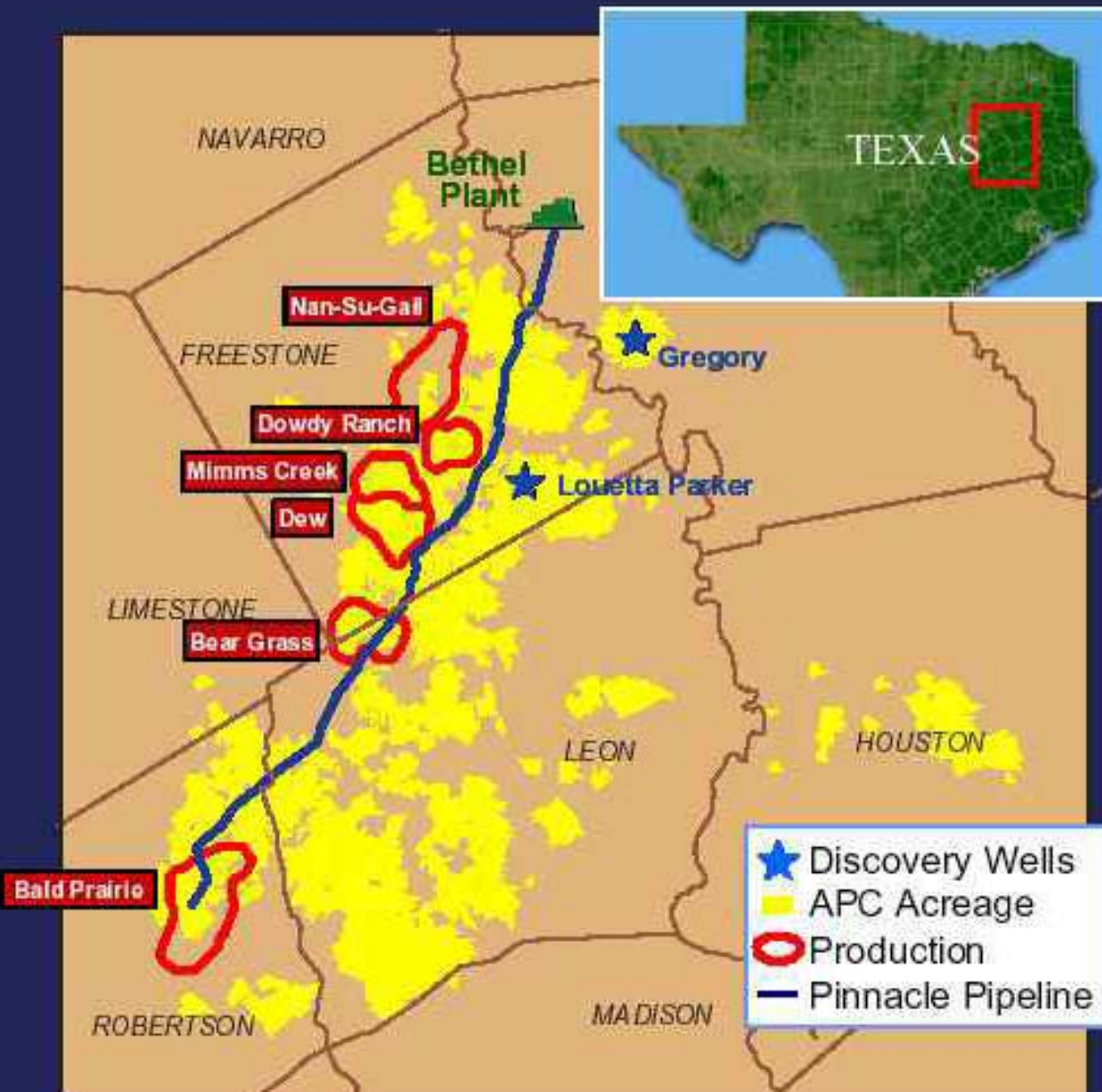
**(From Snedden et al, 2003)**

# Creaming Curve and Sequence Stratigraphy



(From Snedden et al, 2003)

# East Texas Bossier



*(From Seitz, J.N., 2002, Banc of America, Security Energy and Power Conference)*