

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

George D. Klein

SED-STRAT Geoscience Consultants, Inc

Sugar Land, TX, 77479-6238

gdkgeo@earthlink.net

&

Kenneth R. Chaivre

ConocoPhillips Petroleum Co.,



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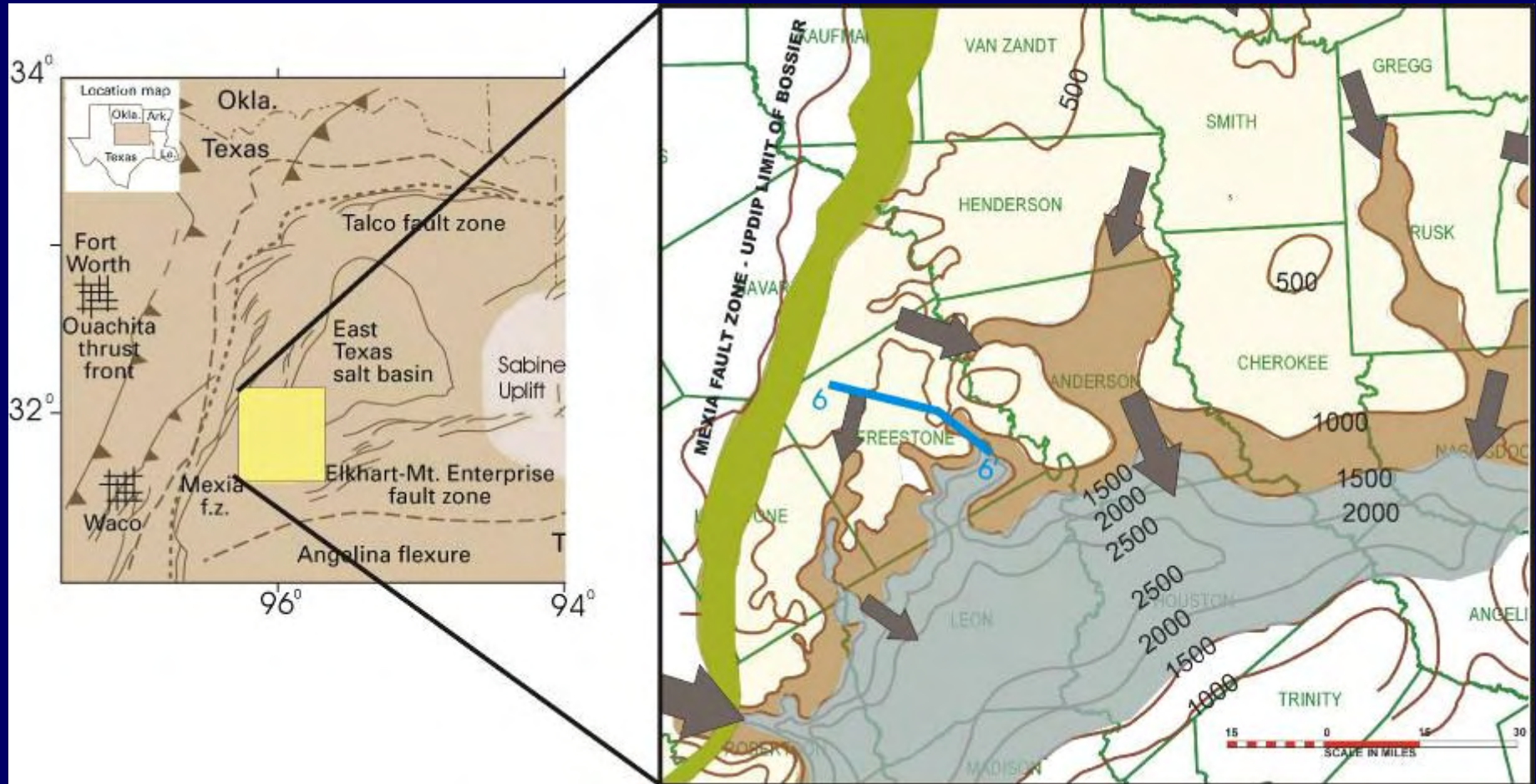
OBJECTIVES:

- 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



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- Ancient Landmass 
- Modern Landmass 
- Subduction Zone (triangles point in the direction of subduction) 
- Sea Floor Spreading Ridge 

(From Scotese, 2000;
www.scotese.com)

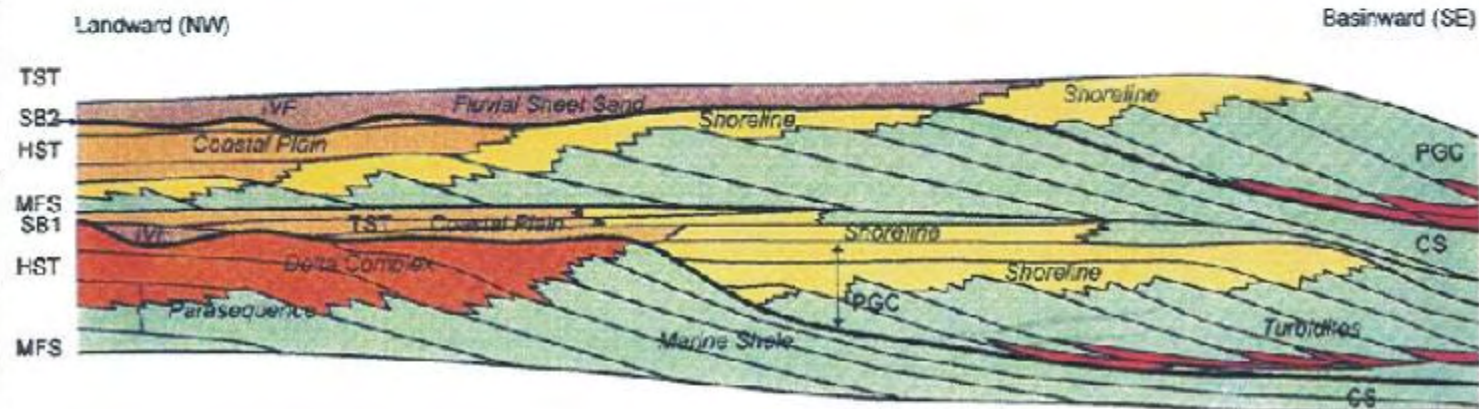
BOSSIER TIME: Characteristics

- **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**

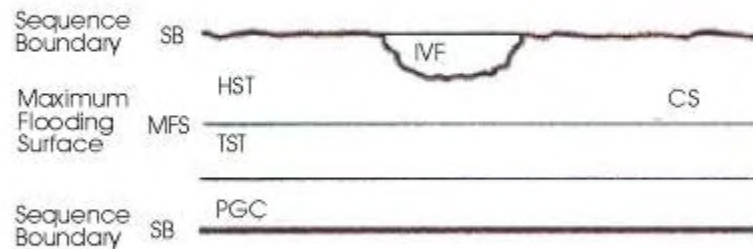
L. Cret Basinward →

BOSSIER STRATIGRAPHY: Two approaches

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
U. Trias	Paleozoics	Louann Salt
		Warner
		Eagle Mills



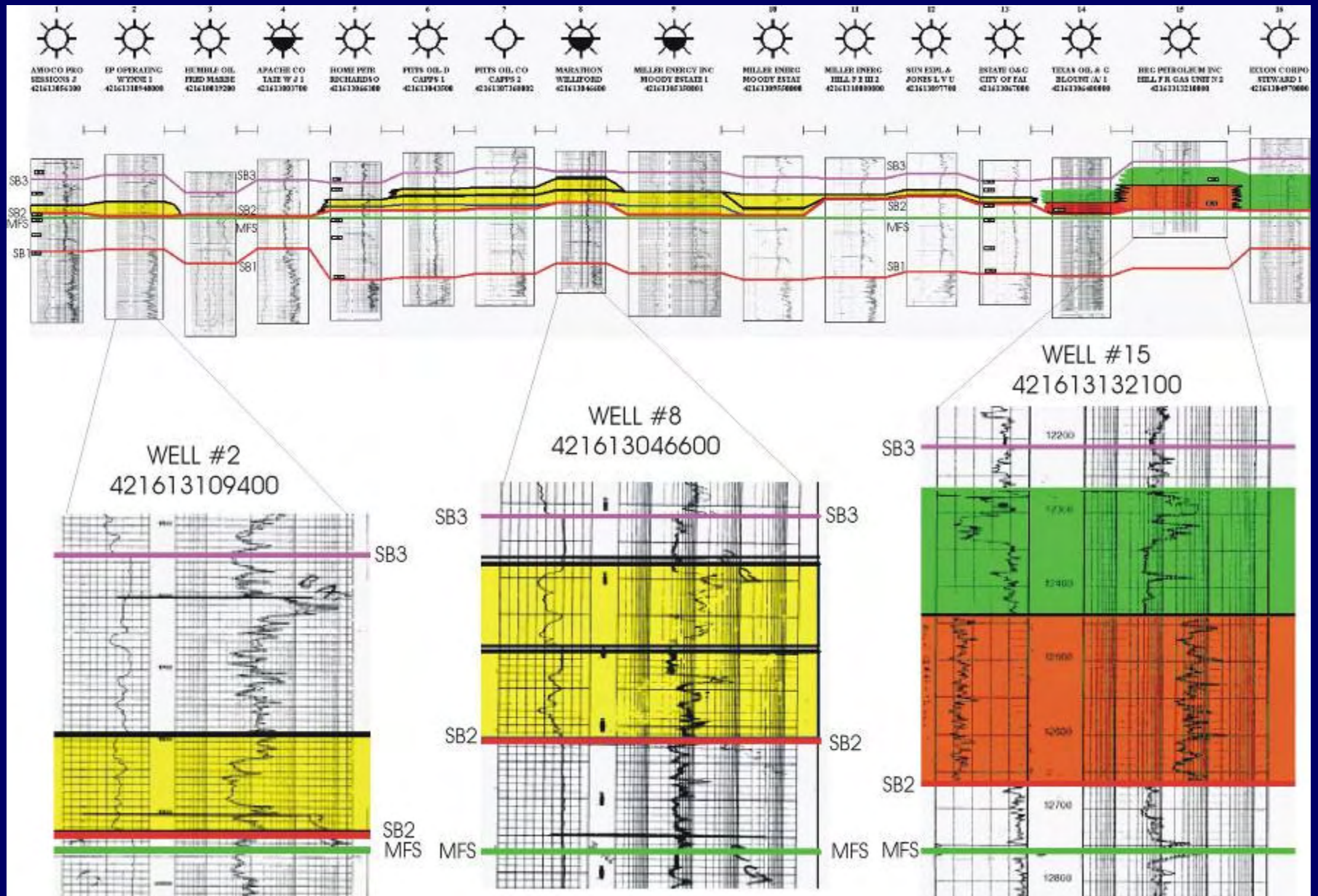
- Coastal Plain and Lagoon
- Incised Valley Fill; Fluvial Sheet Sands
- Delta Complex
- Wave-Dominated Shorelines
- Turbidites
- Marine Shale and Carbonates



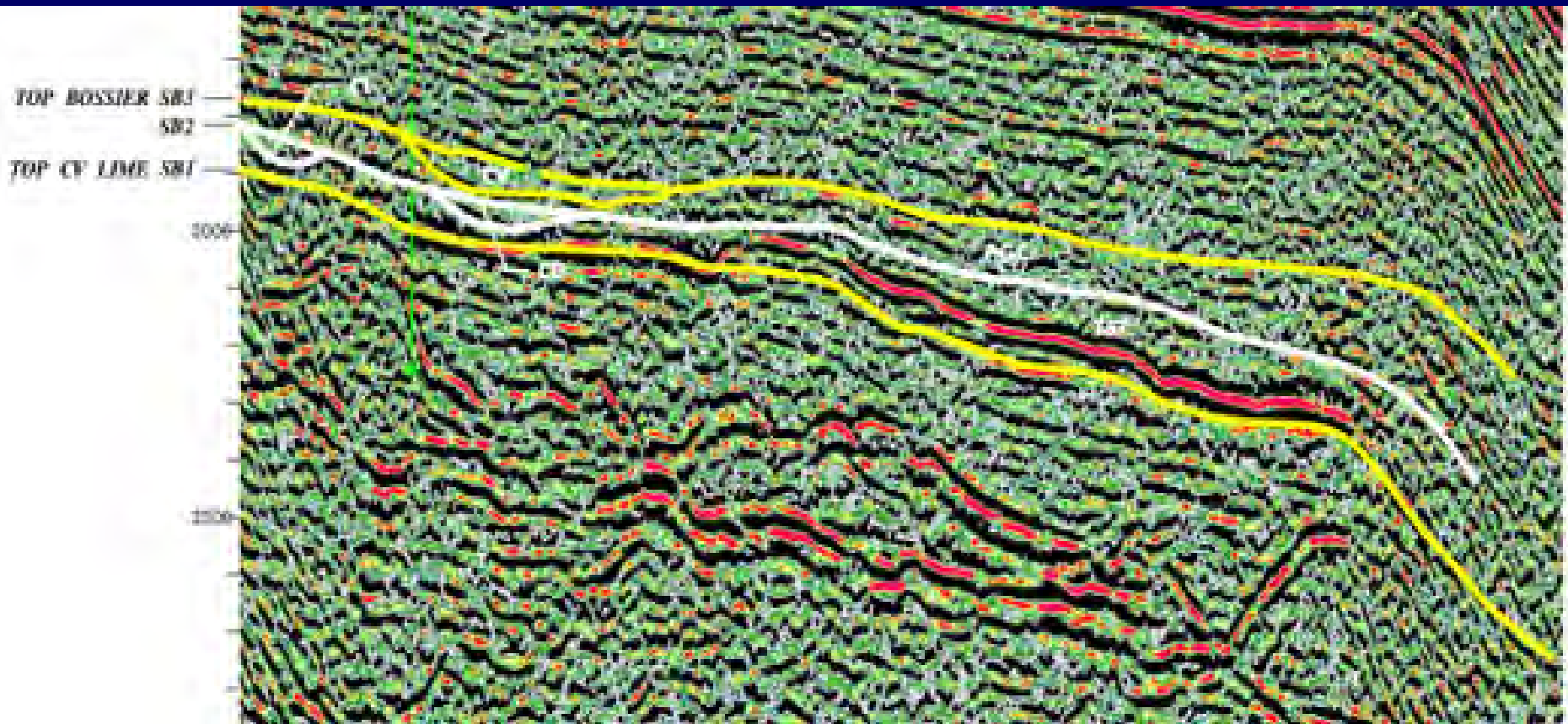
- Incised Valley Fill (Lowstand systems tract)
- Highstand systems tract (Condensed Section)
- Transgressive systems tract
- Prograding Complex (Lowstand Systems tract)

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

WELL LOG CROSS-SECTION #6

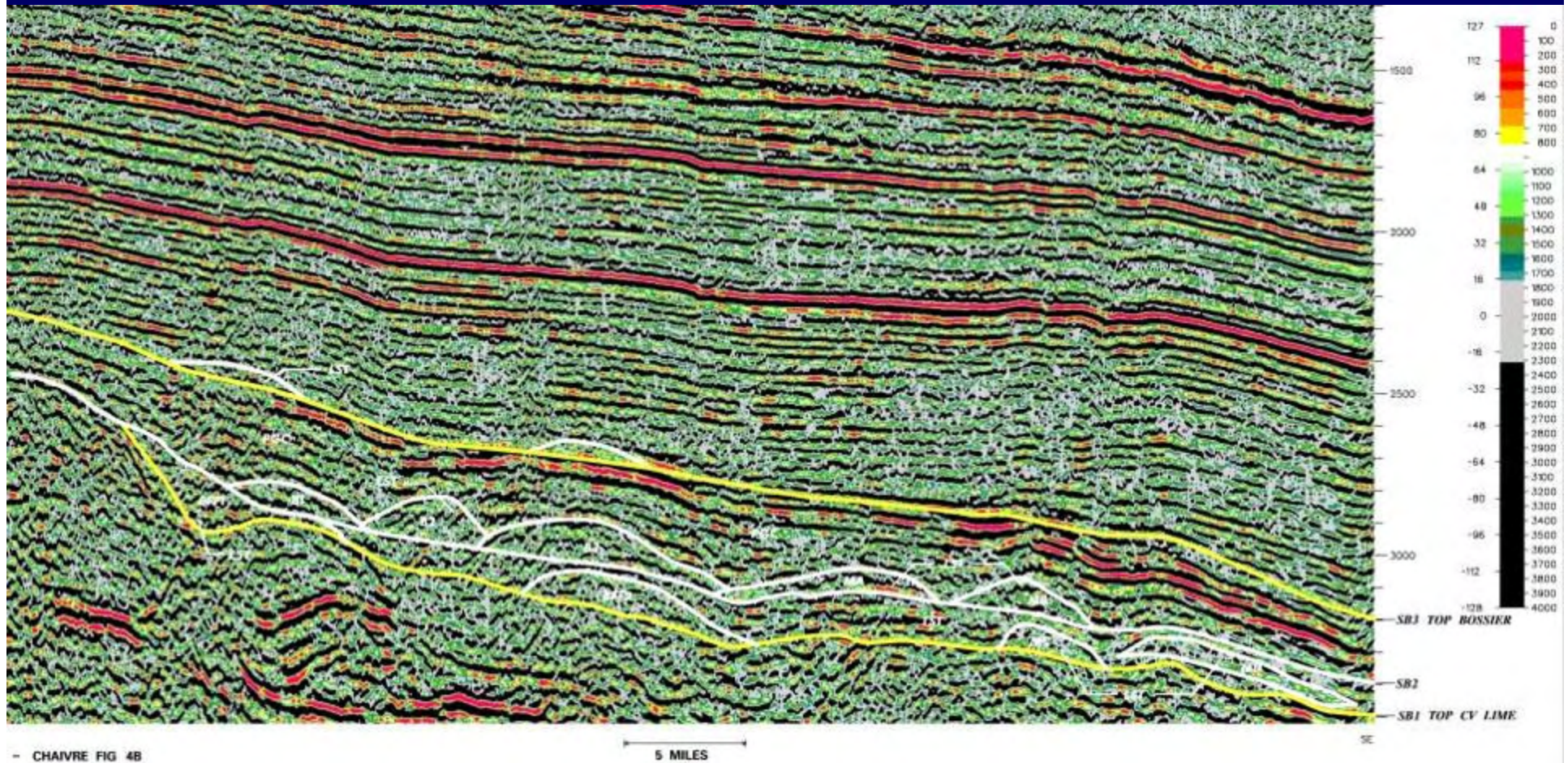


Seismic Dip Line (*up-dip end*)



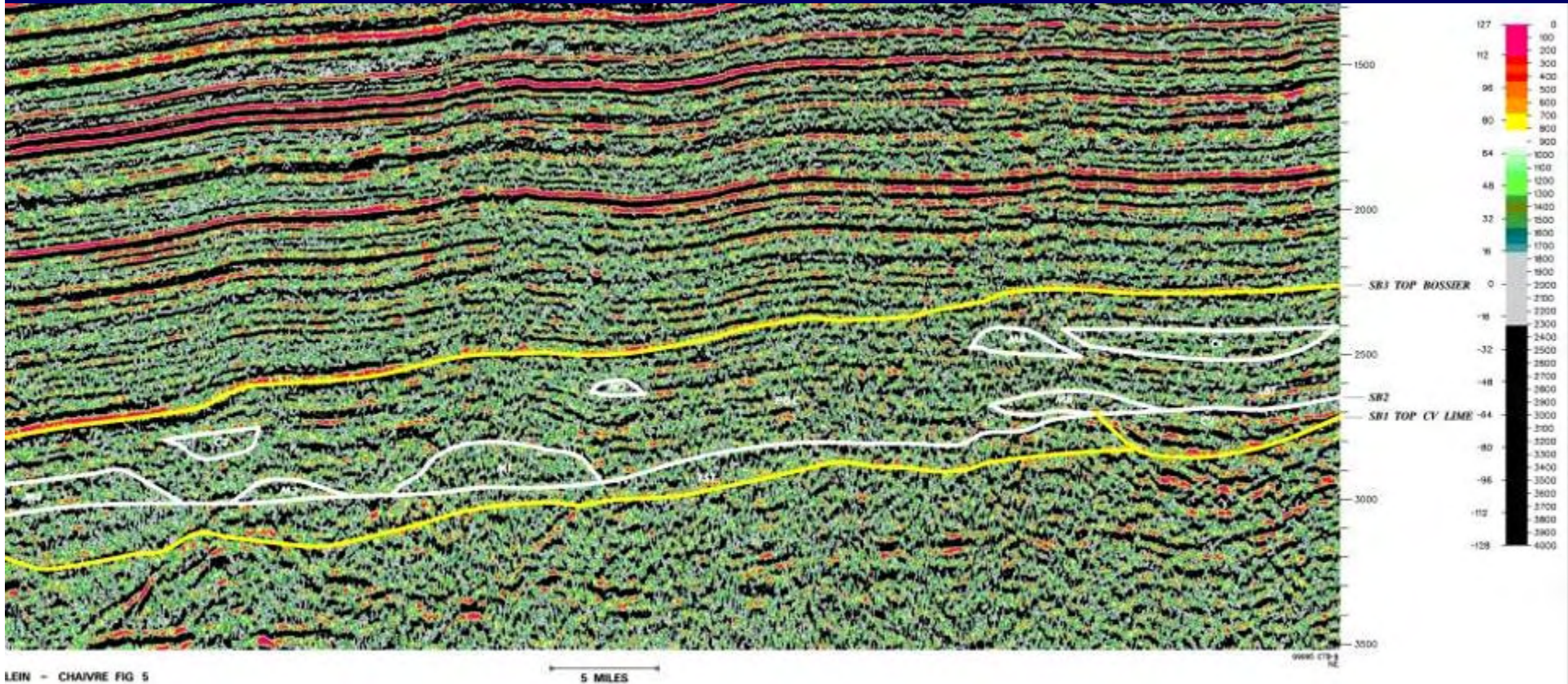
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Seismic Dip Line (*down-dip end*)



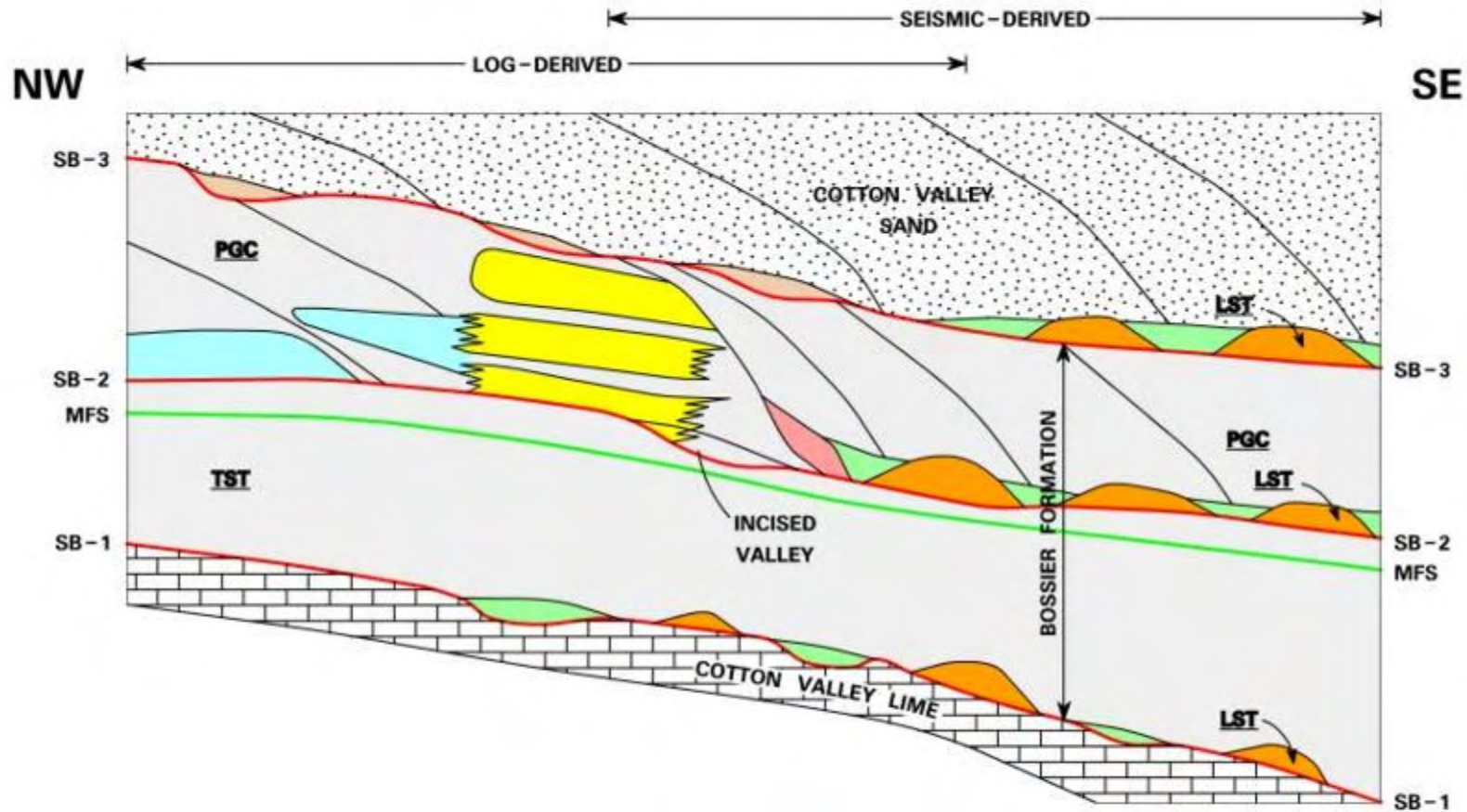
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Seismic Strike Line









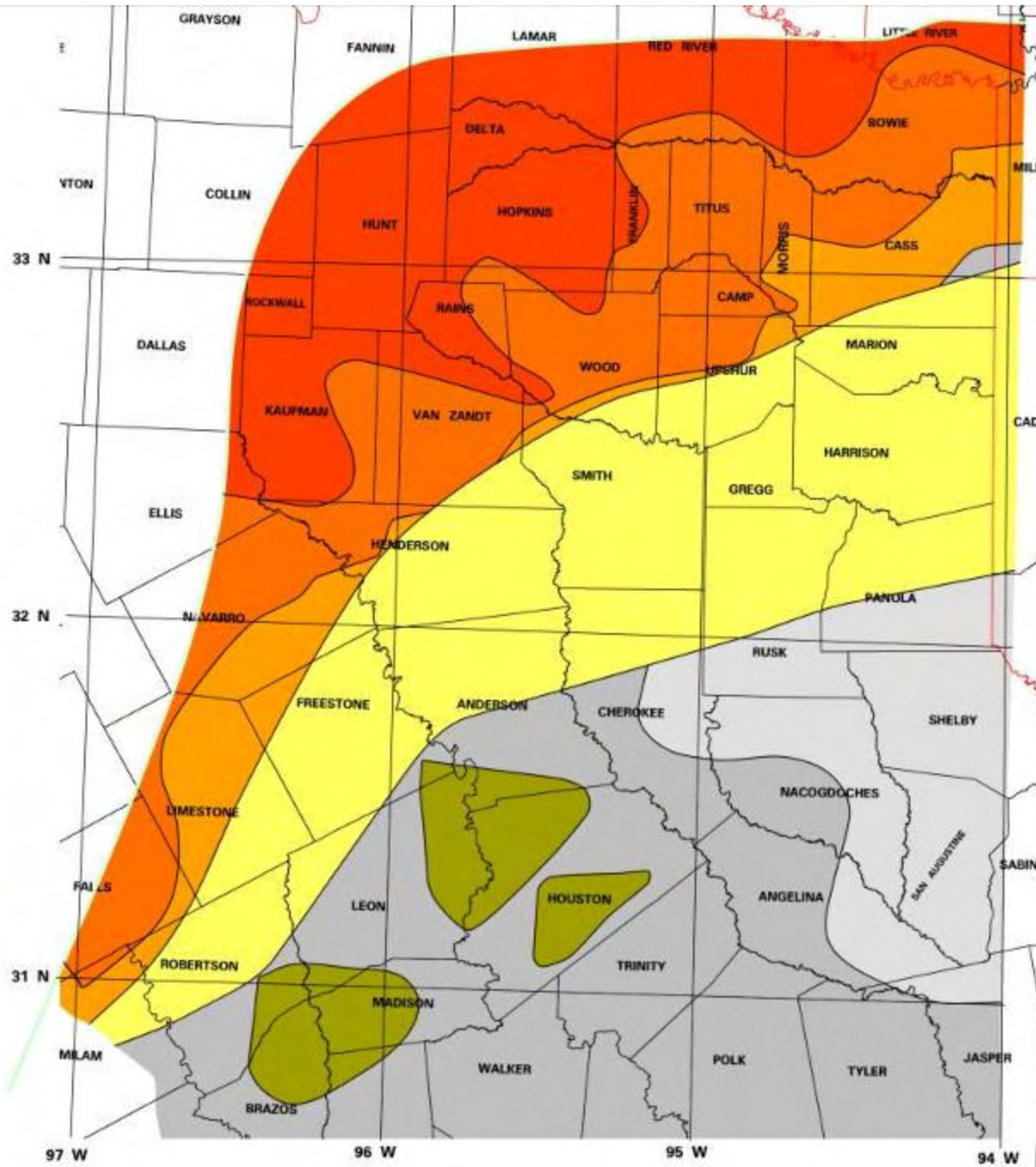
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BOSSIER FORMATION SEQUENCE STRATIGRAPHIC MODEL EAST TEXAS BASIN



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

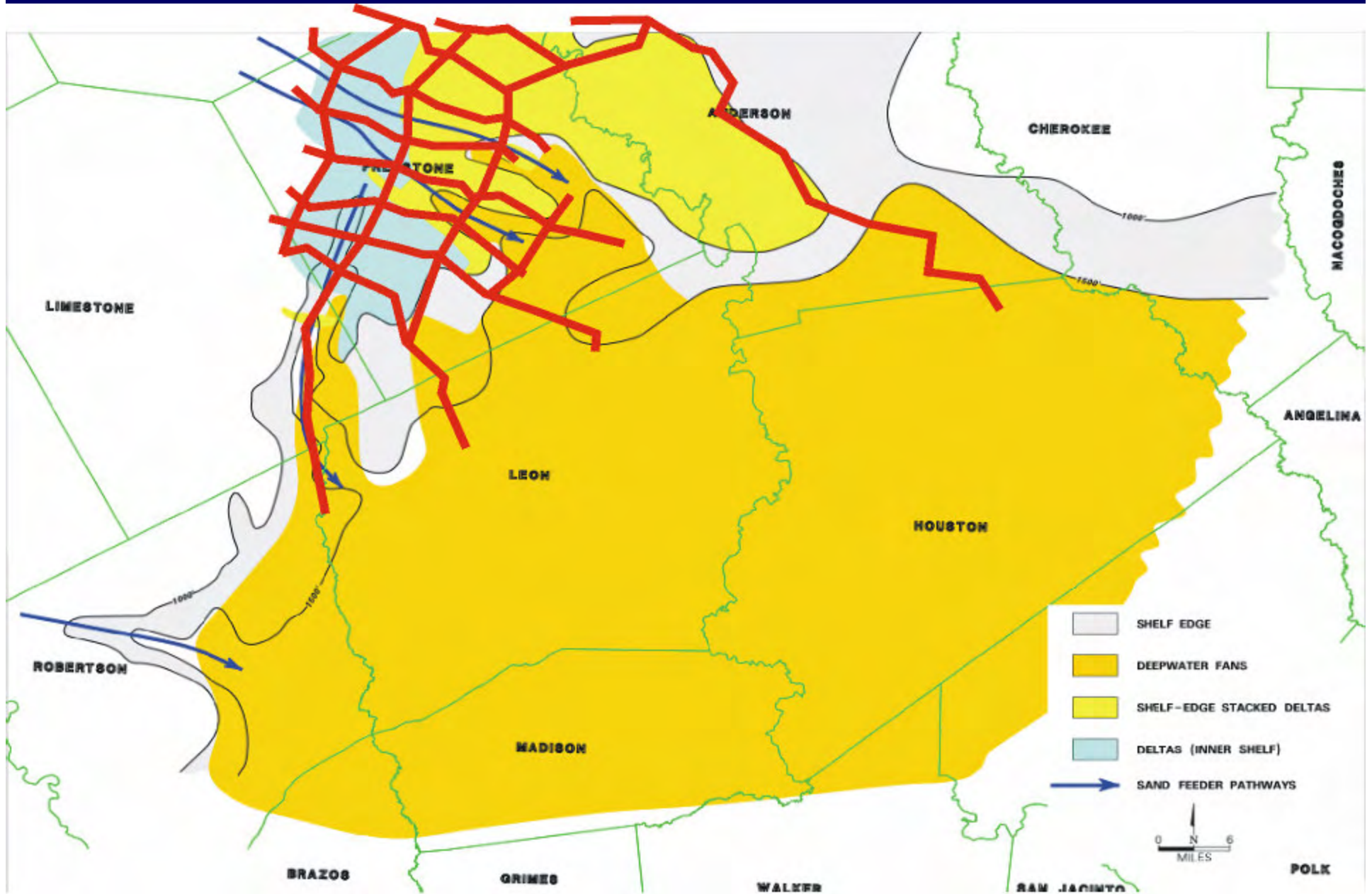
- | | | |
|---|---|---------------------------------------|
|  BASIN FLOOR FAN |  SHELF-EDGE DELTA | PGC PROGRADING COMPLEX |
|  SLOPE FAN |  CHANNELS | TST TRANSGRESSIVE SYSTEM TRACT |
|  LEVEE/CHANNEL COMPLEX |  DELTA (INNER SHELF) | LST LOW-STAND SYSTEM TRACT |

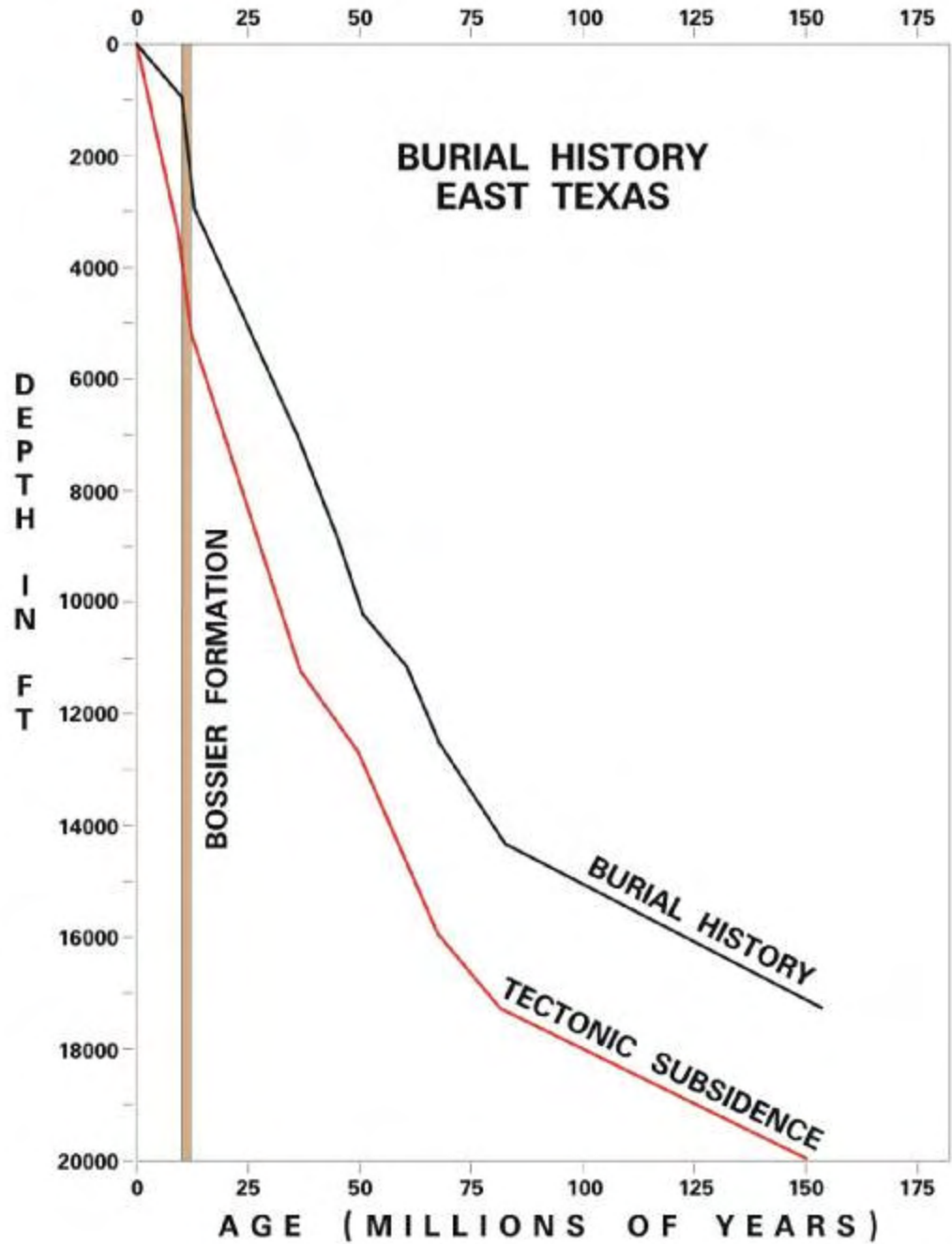


KLEIN - CHAIVRE FIG 6

(Modified
From
Ewing,
2001)

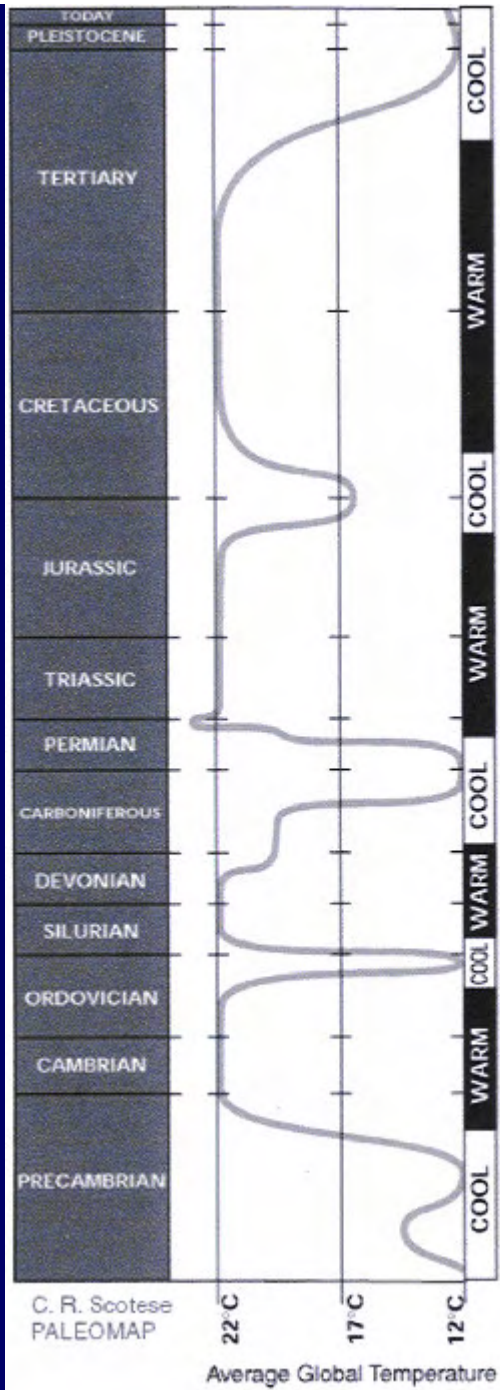
BOSSIER DEPOSITIONAL UNITS & PLAY MAP





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.**



(From Scotese, 2000,
www.Scotese.com)

GENERAL CONCLUSION

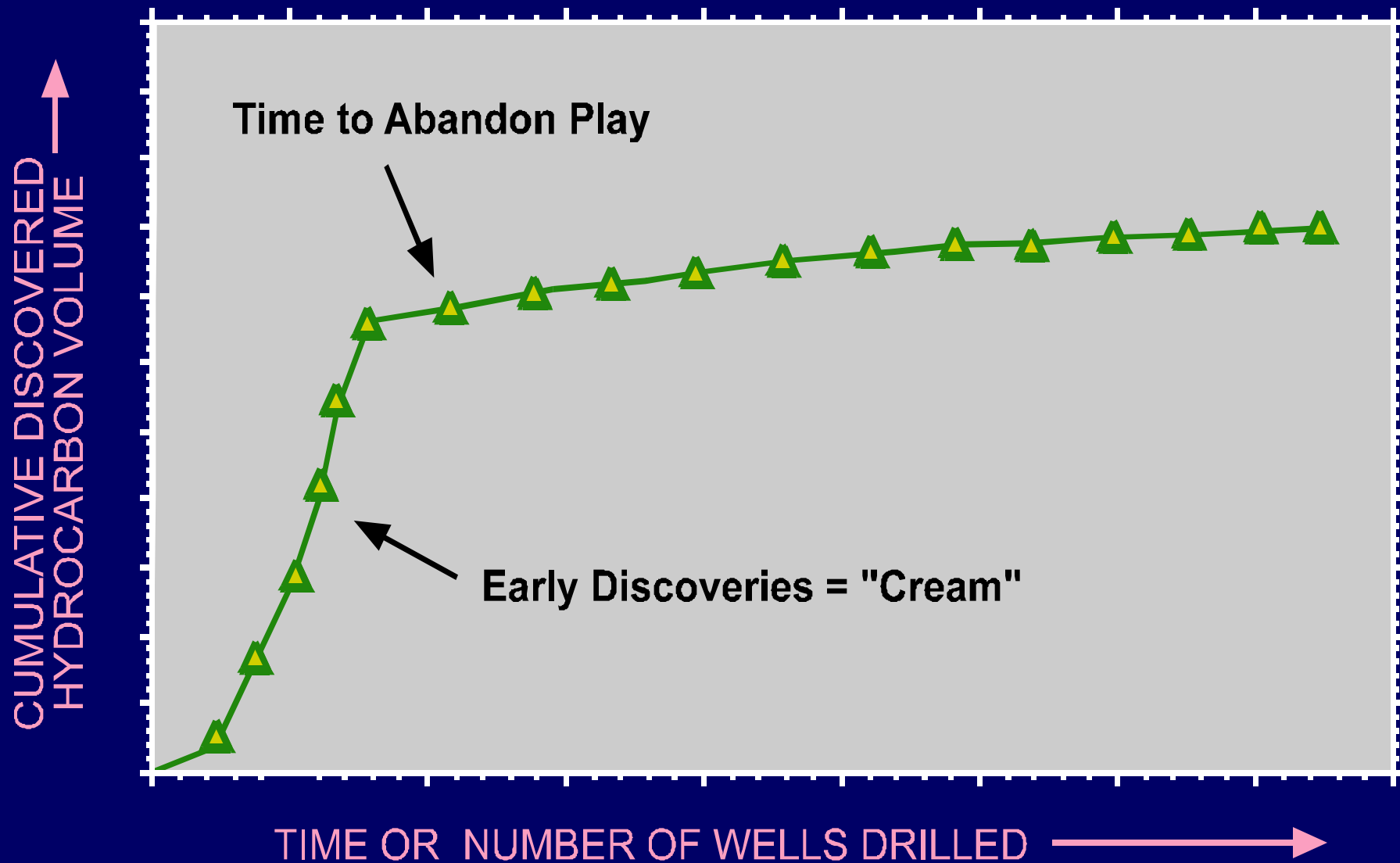
In Mud-dominated systems, a drop in sea level will extend fluvial systems basinward. An associated change in climate is the Driver that disperses sand into such settings.

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

FUTURE OF BOSSIER PLAY??????

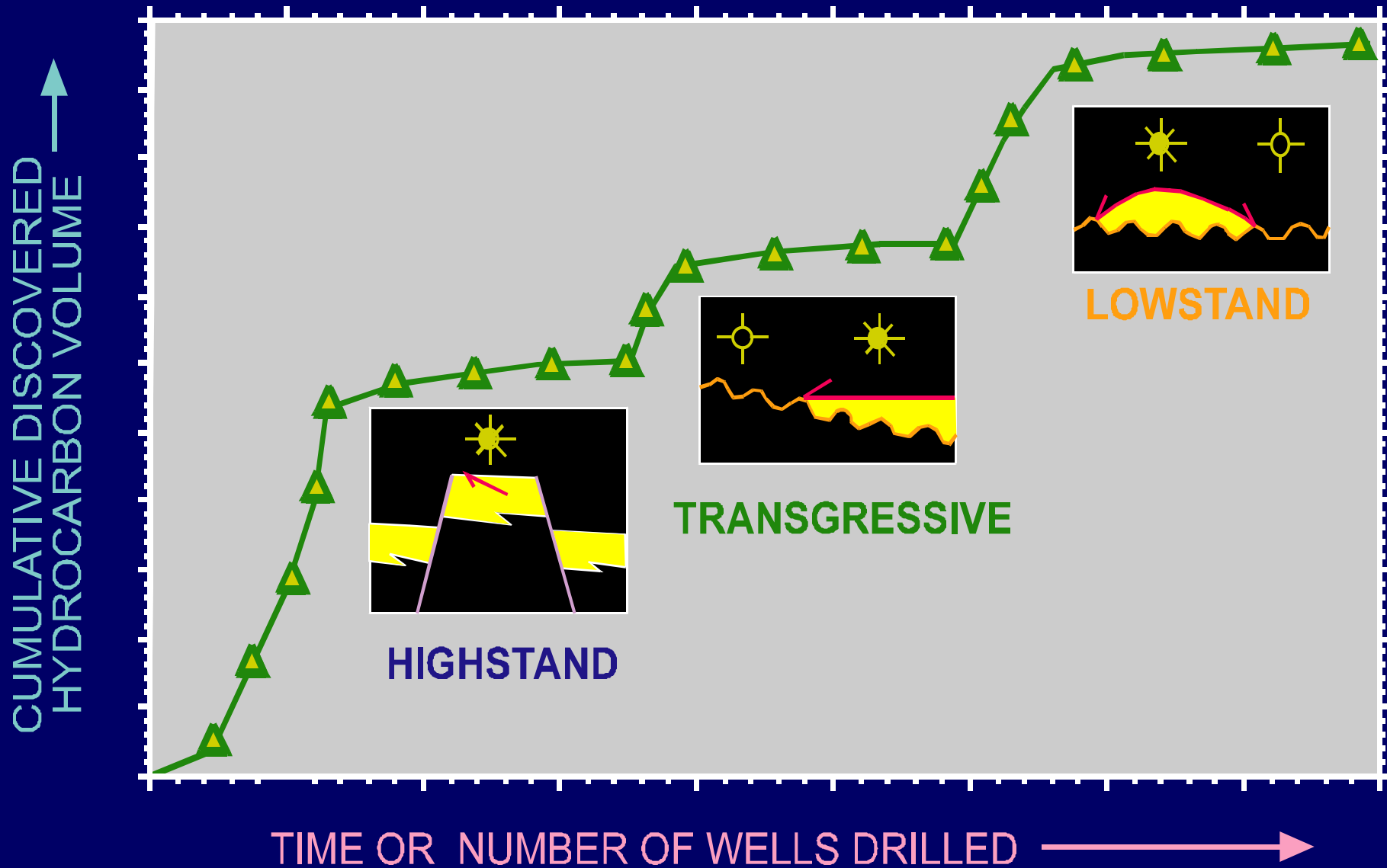
- Price: > \$4.00 to \$4.50
- Acreage Costs
- Engineering at depths > 19,000'
- Creaming Curves.

Conventional Discovery Curve



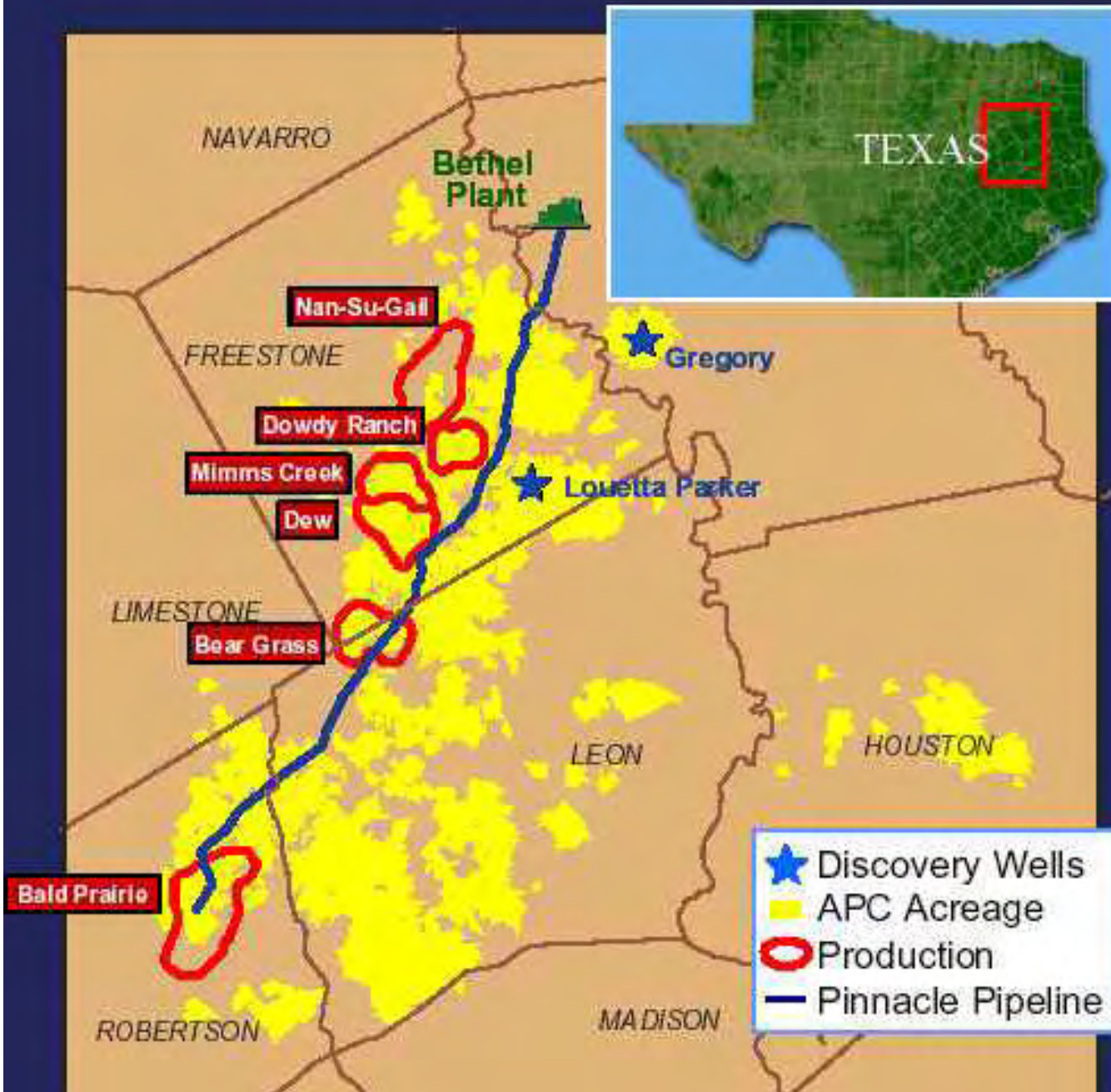
(From Snedden et al, 2002)

Creaming Curve and Sequence Stratigraphy



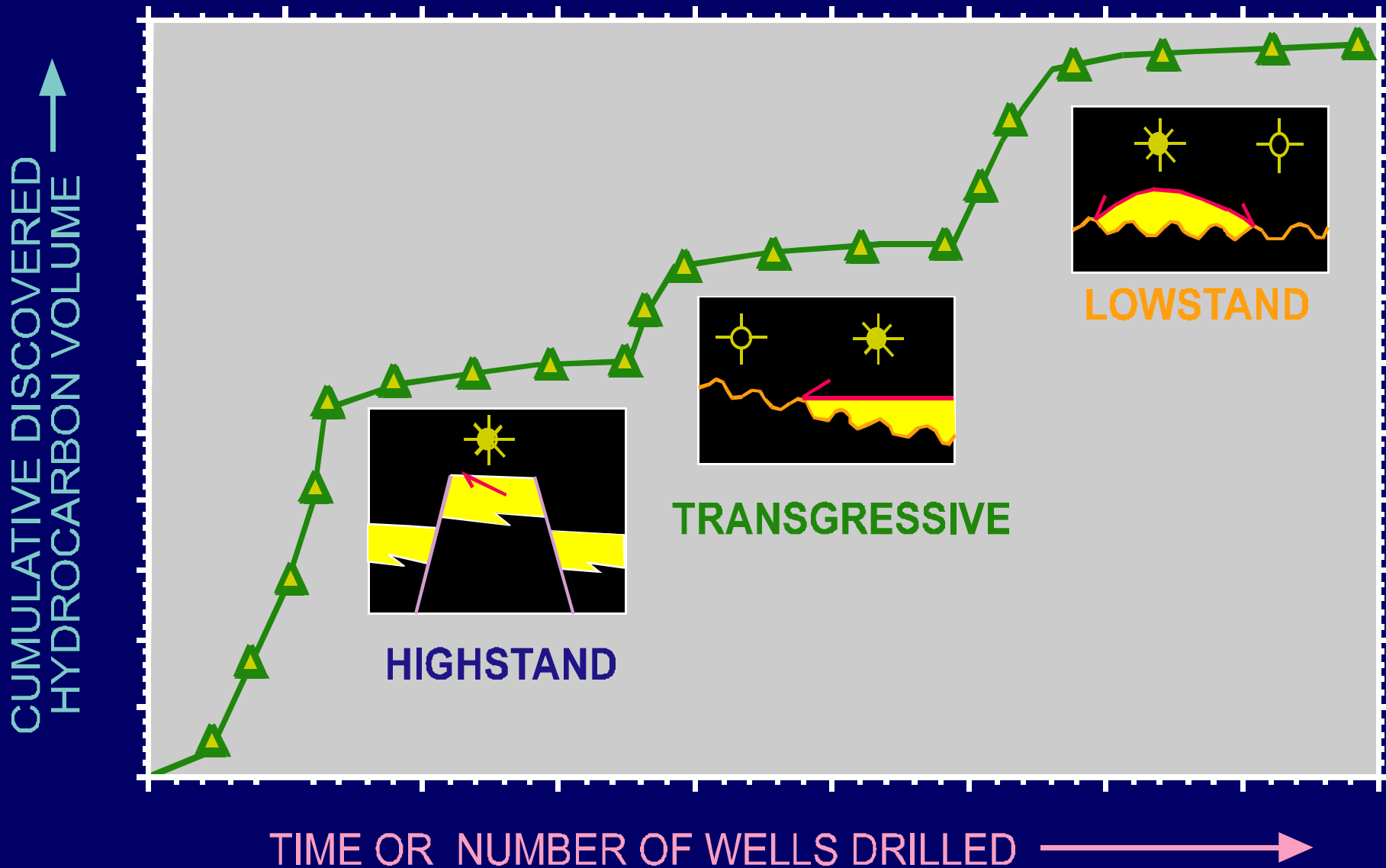
(From Snedden et al, 2002)

East Texas Bossier



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

Creaming Curve and Sequence Stratigraphy



(From Snedden et al, 2002)