

The Booch Gas Play

In Southeastern Oklahoma

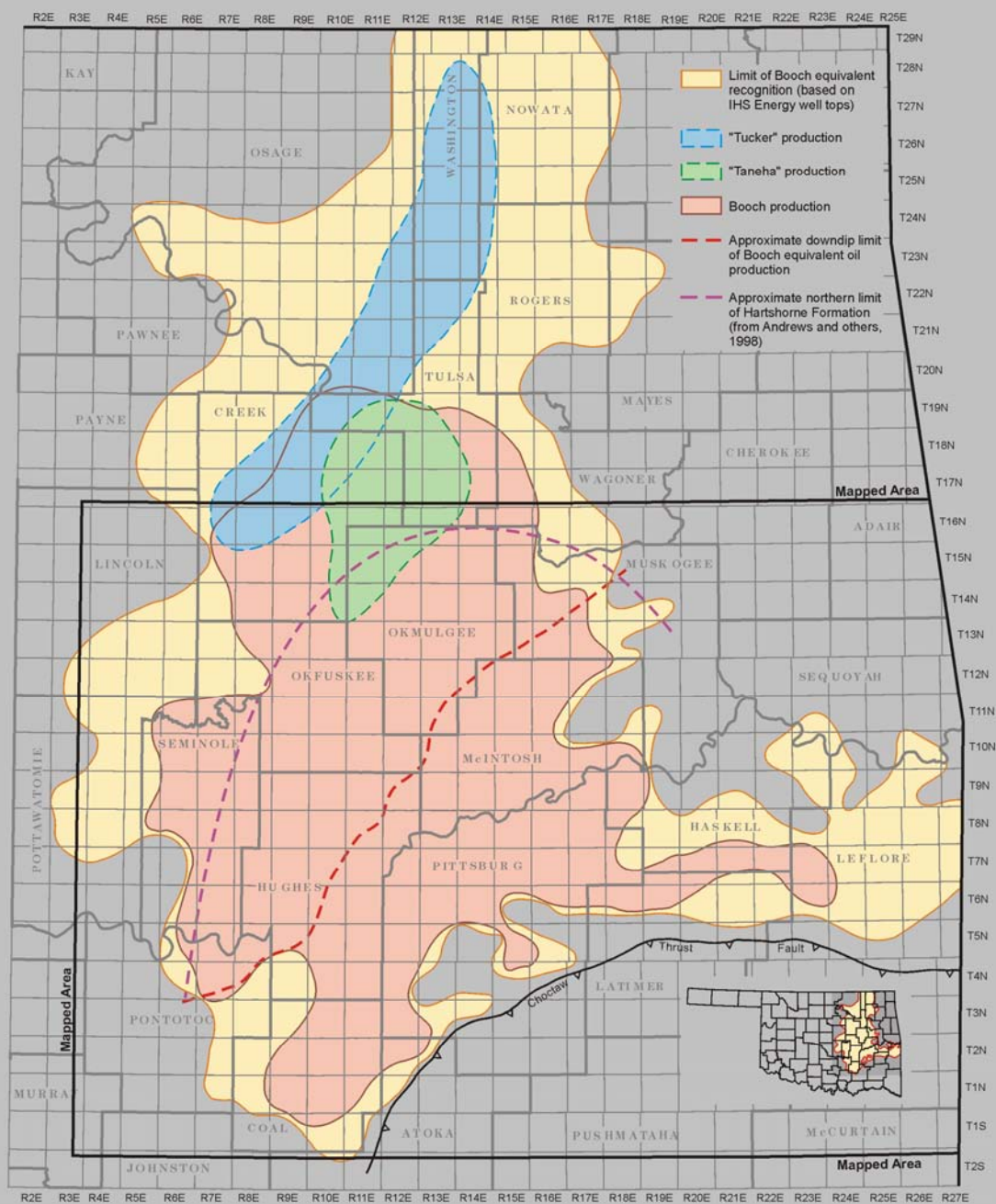
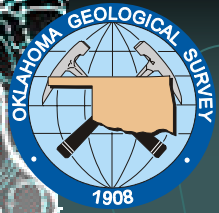
Dan T. Boyd

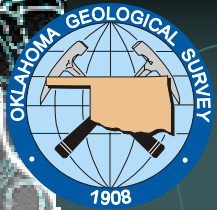
February 14, 2006



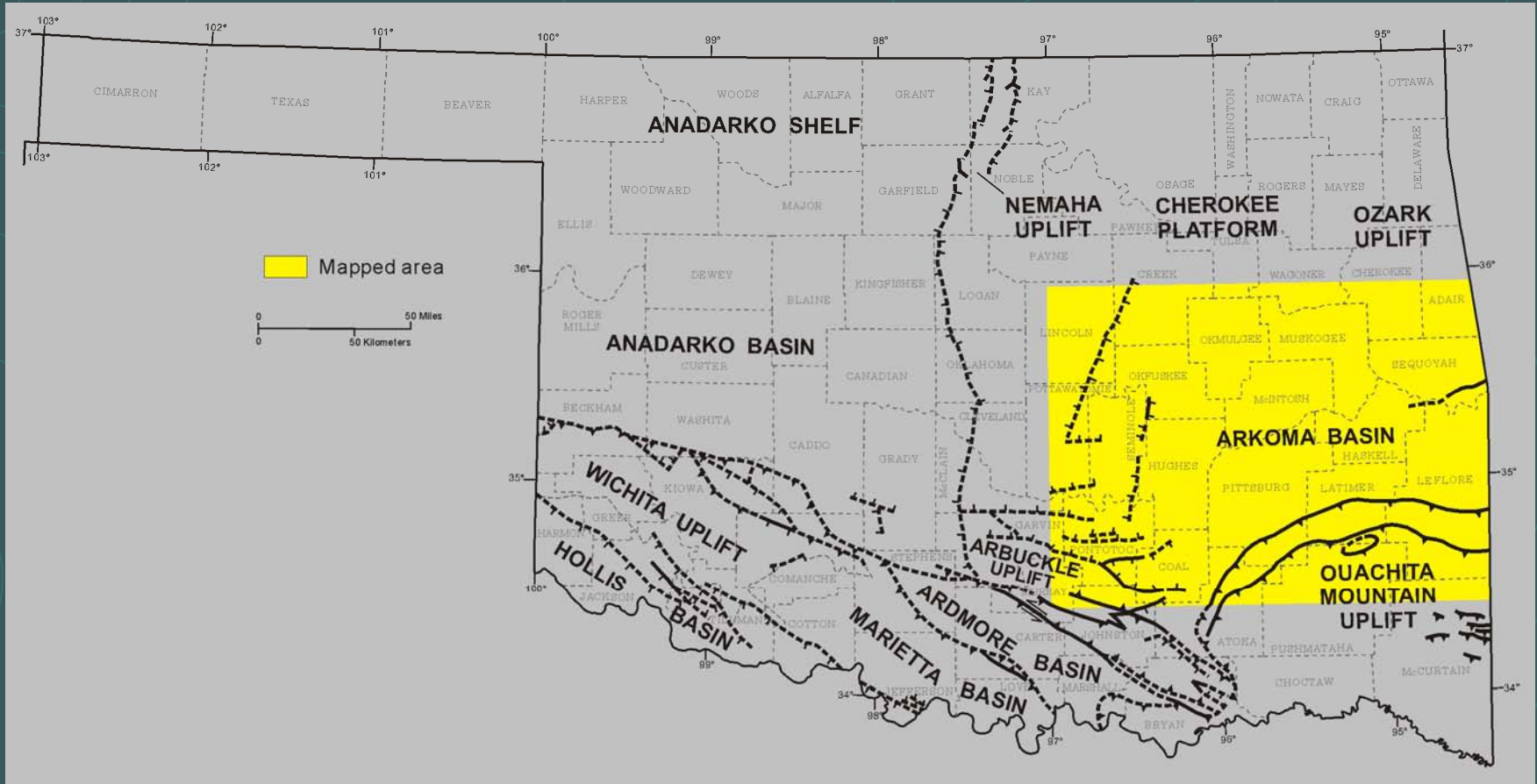
Overview - Methodology

Booch-Equivalent Production

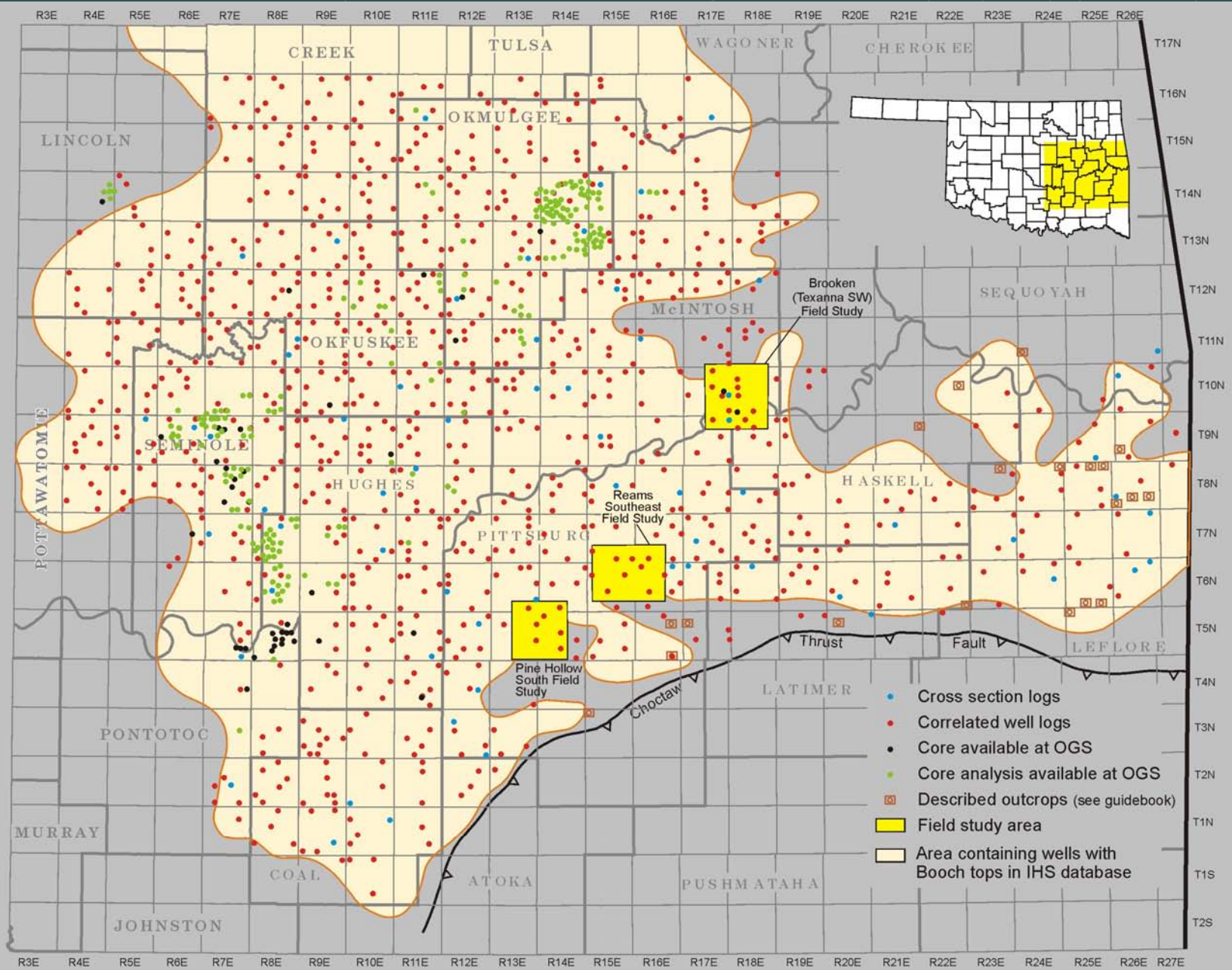
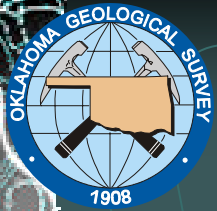




Geologic Provinces of Oklahoma

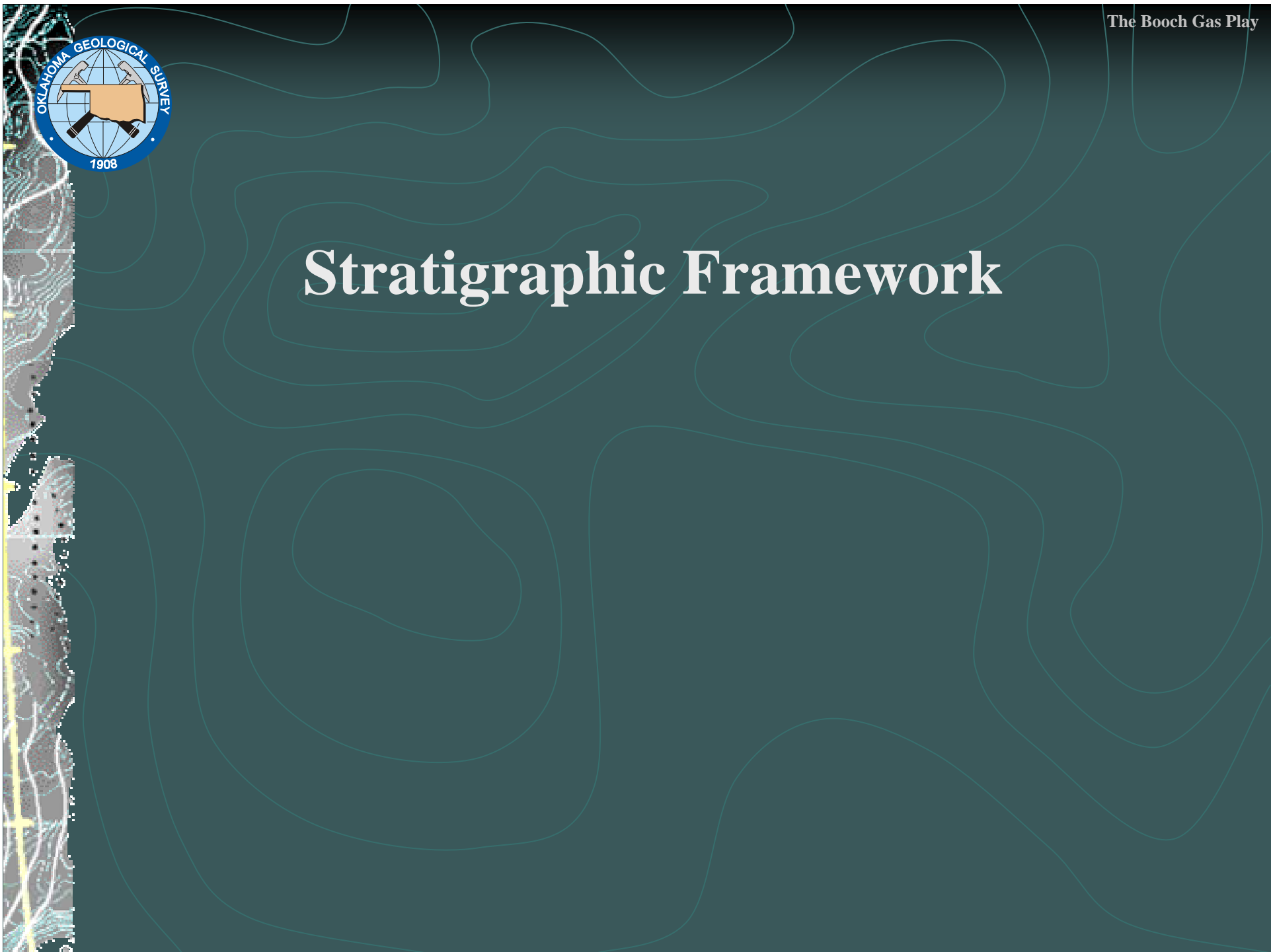


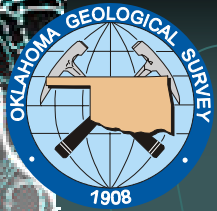
Regional Data Input





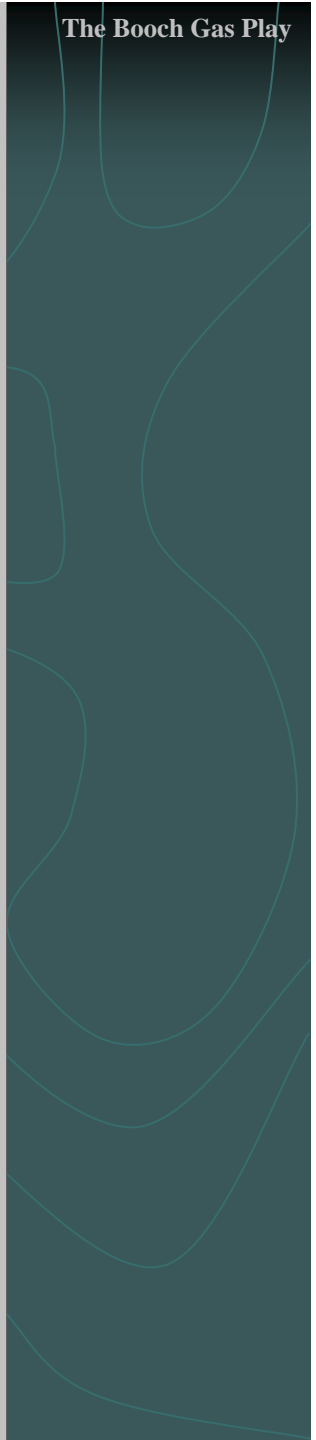
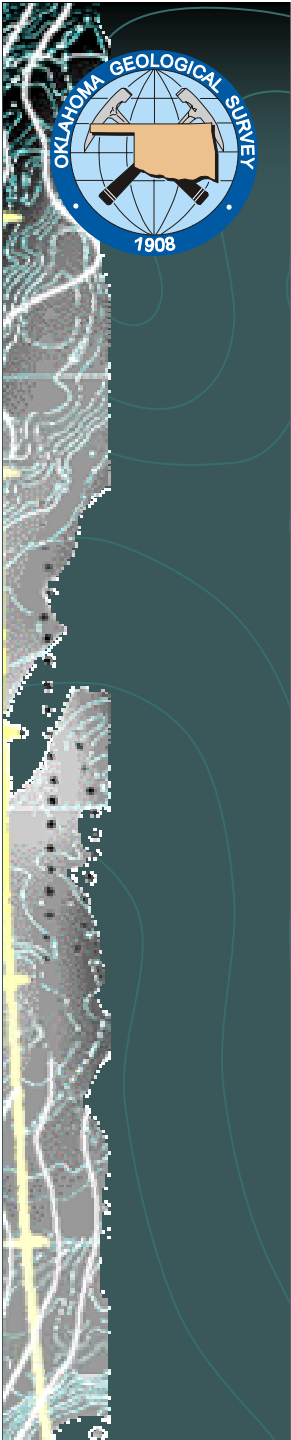
Stratigraphic Framework

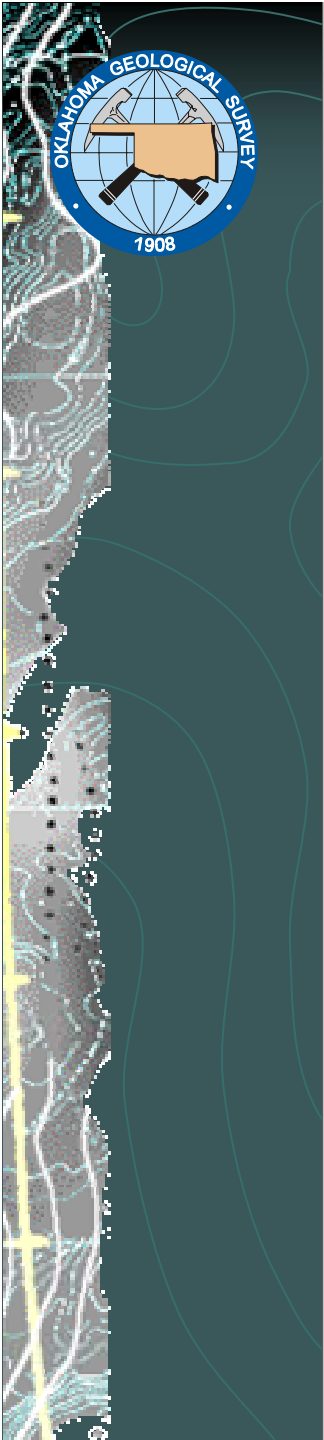




Booch Stratigraphic Nomenclature

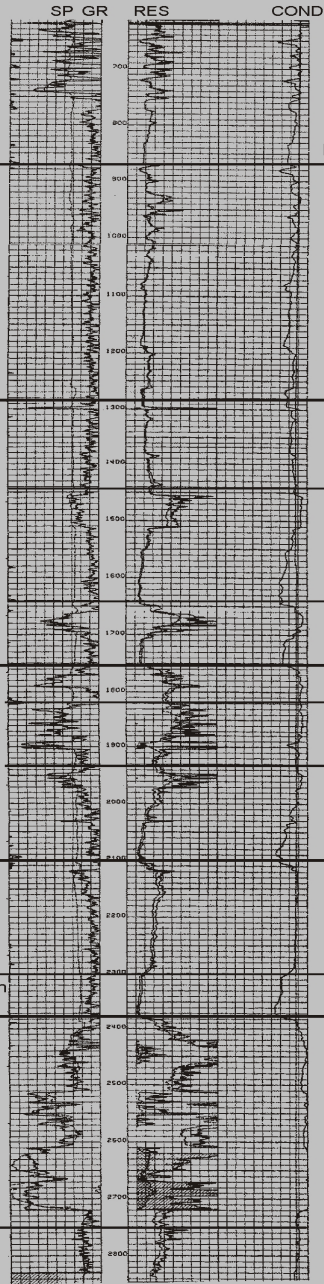
SYSTEM		SERIES		GROUP	FORMATION	
P E N N S Y L V A N I A N		D E S M O I N E S I A N		C A B A N I S S	T H U R M A N	
A T O K A N		A T O K A		B O G G Y		
A T O K A		A T O K A		S A V A N N A		
					<div style="display: flex; justify-content: space-around; border-bottom: 1px solid black; padding-bottom: 5px;"> FORMAL SURFACE INFORMAL SUBSURFACE THIS STUDY </div>	
				Spaniard Limestone	Brown Limestone	PS=Parasequence
				Keota Sandstone Keota Coal	Usually Identified as Savanna	
				Tamaha Coal Tamaha Sandstone		
				Upper McAlester Coal		
				McAlester(Lehigh, Stigler) Coal		McAlester Coal
				Cameron Sandstone		PS-0
				Lequire Sandstone		PS-1
						PS-2
				Upper Warner Sandstone		PS-3
				Lower Warner Sandstone	Taneha/Tucker Sandstone	PS-3A
				(Unnamed Sandstone)		PS-4
				Unnamed Sandstone		PS-5
				McCurtain Shale	McCurtain Shale	PS-6
				HARTSHORNE		
				A T O K A		





ATOKAN	PENNSYLVANIAN	SAVANNA	SAVANNA
ATOKA	DESMOINESIAN	UPPER McALESTER	UPPER McALESTER
	KREBS	BOOCH	BOOCH
		UPPER	UPPER
		MIDDLE	MIDDLE
		LOWER	LOWER
		McCurtain Shale	McCurtain Shale
		HARTSHORNE	HARTSHORNE

Oneok Exploration
 Burr #5
 NW SE Sec. 20-7N-17E
 KBE: 667
 Subsurface Terminology



Industry Brown Limestone Equivalent

T/McAlester Coal Marker

PS-0

PS-1

PS-2

PS-3

PS-3A

PS-4

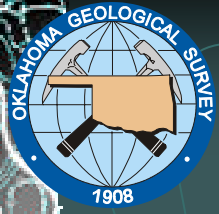
PS-5

PS-6

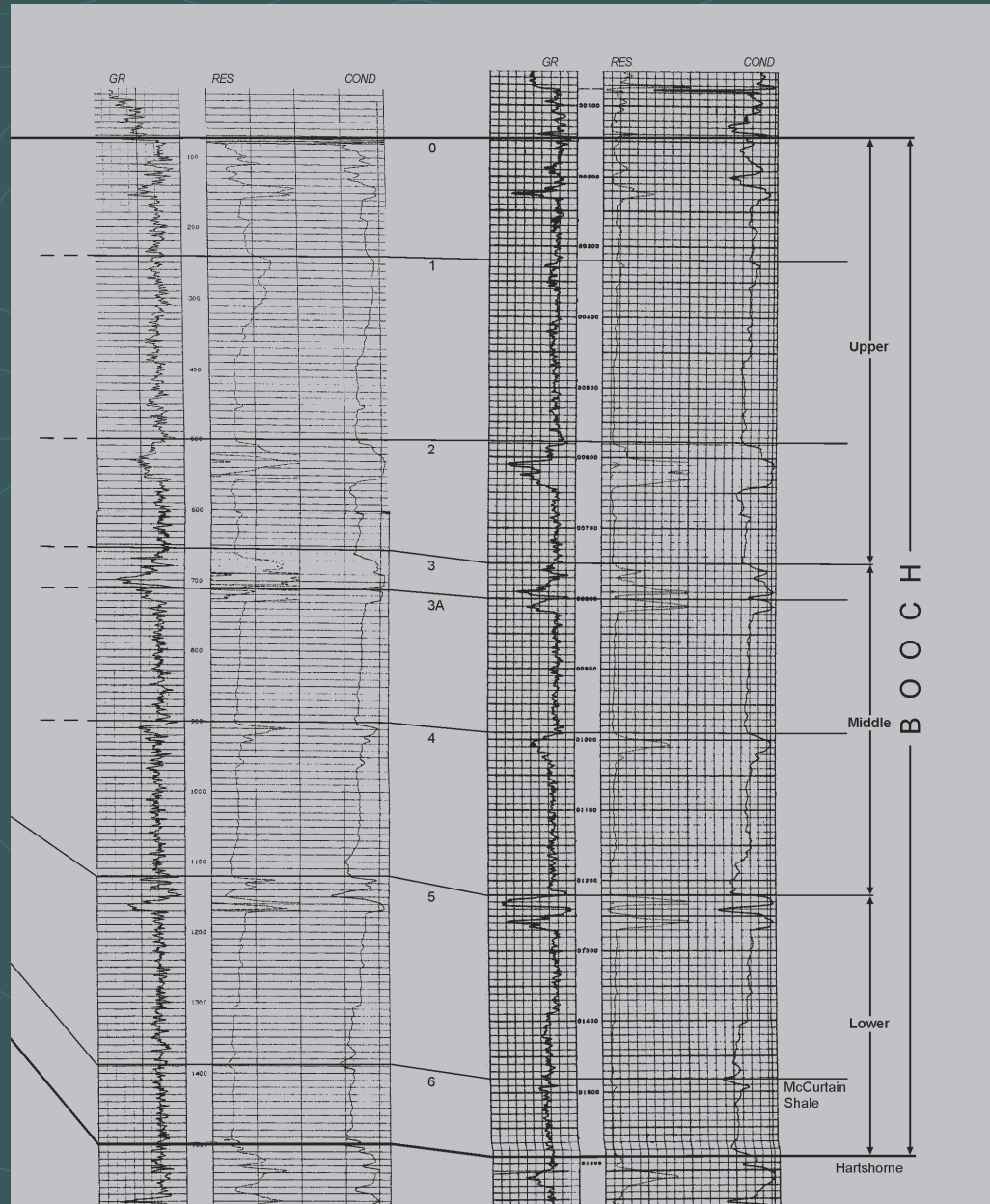
(PS-Parasequence)

The Booch Gas Play

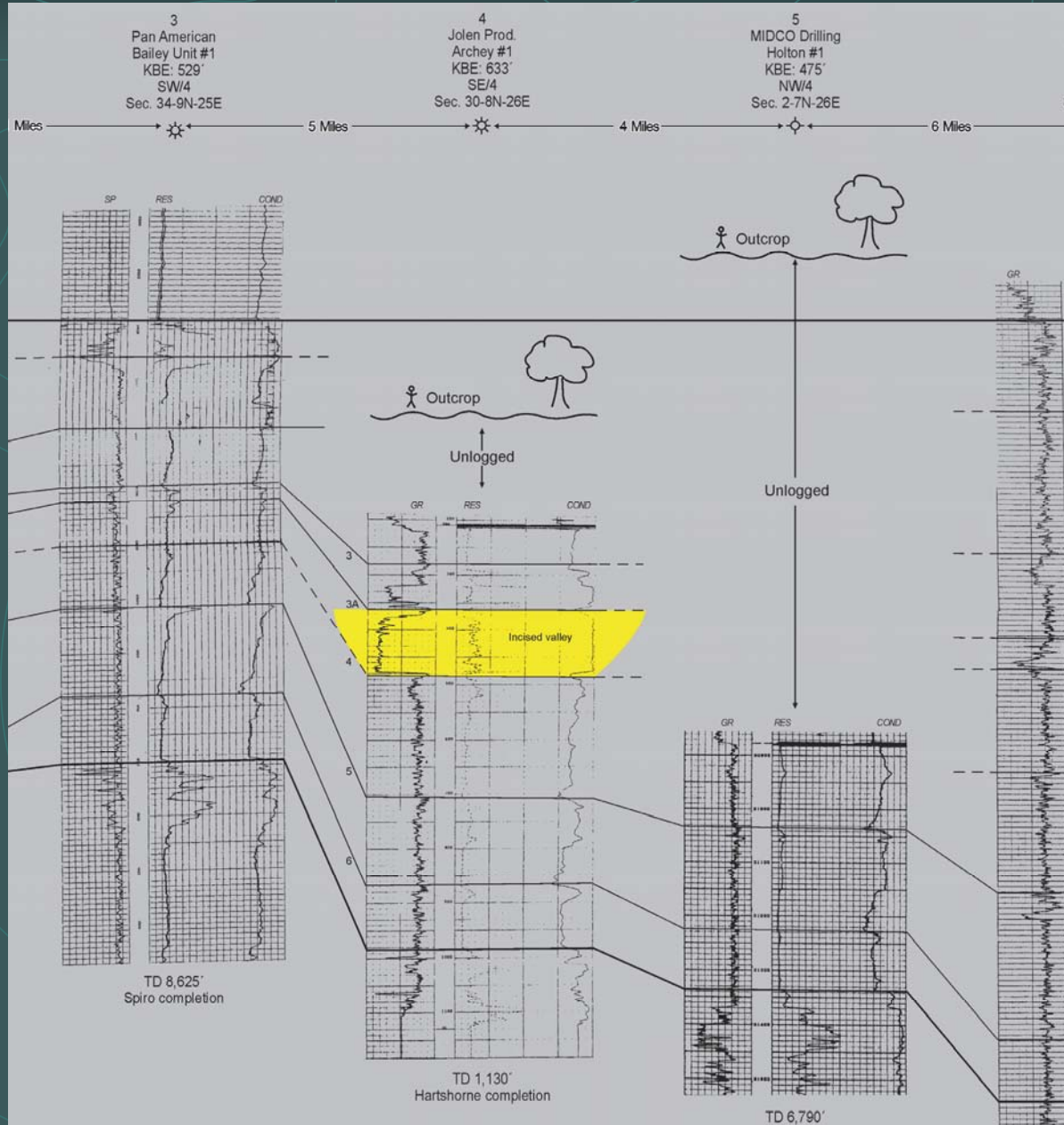
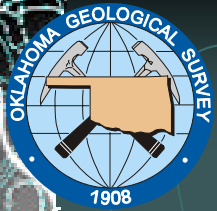
Booch Type Log

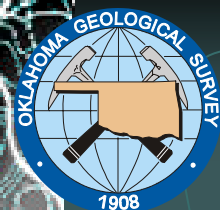


Booch Regional Cross-Section C-C'



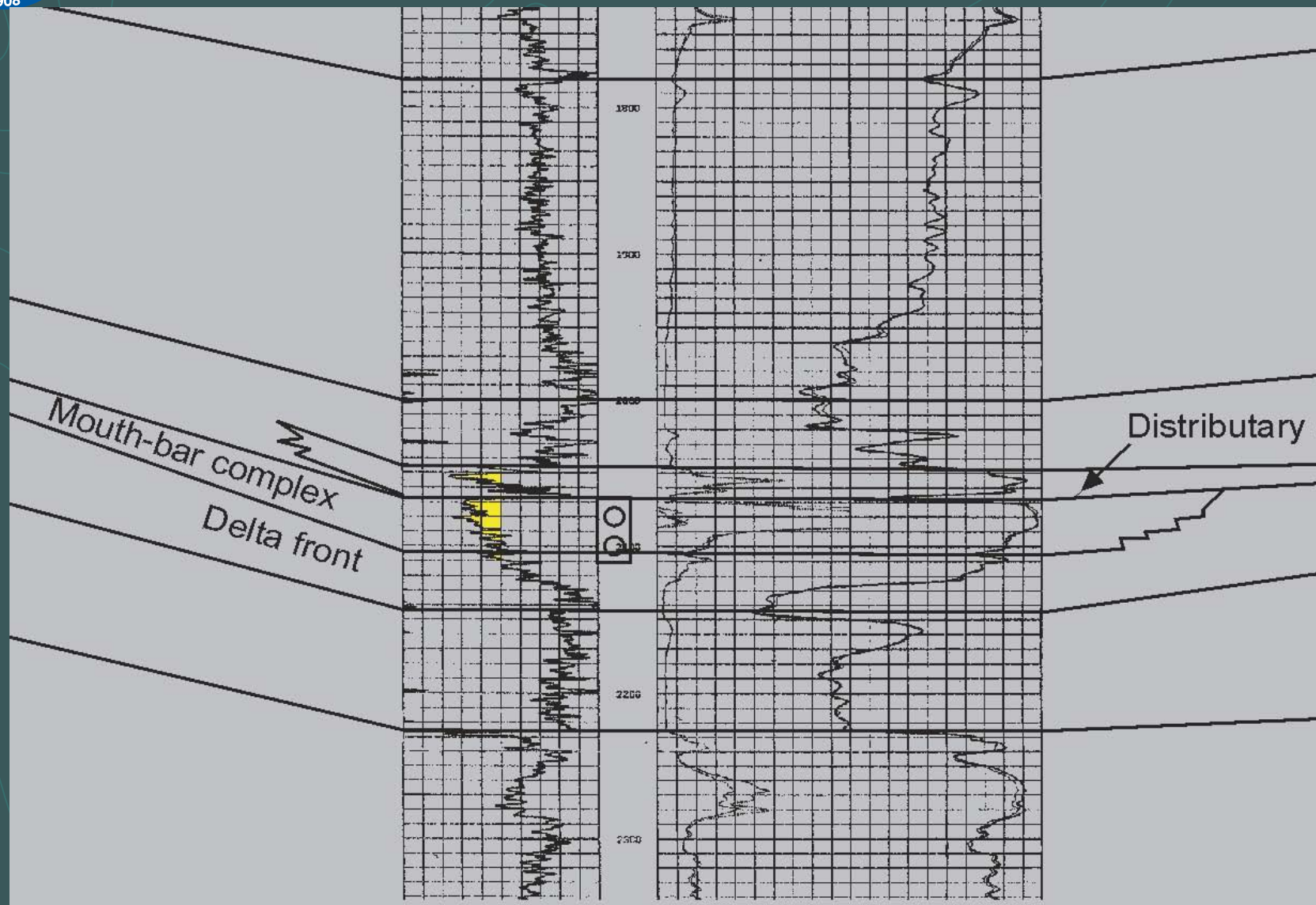
Booch Regional Cross-Section C-C'

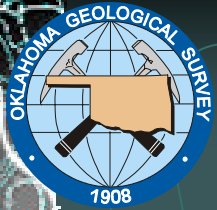




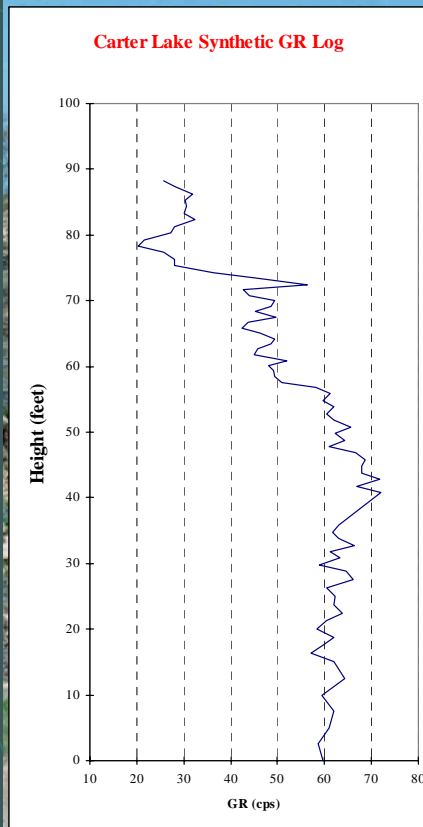
Typical Booch Parasequence Log Character

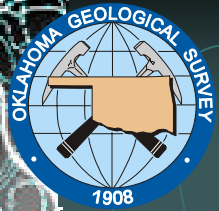
From Tag Team Resources Sandra #1-13
NE Sec 13-5N-13E (Pine Hollow South Field)





Carter Lake Outcrop PS-3 (Warner)





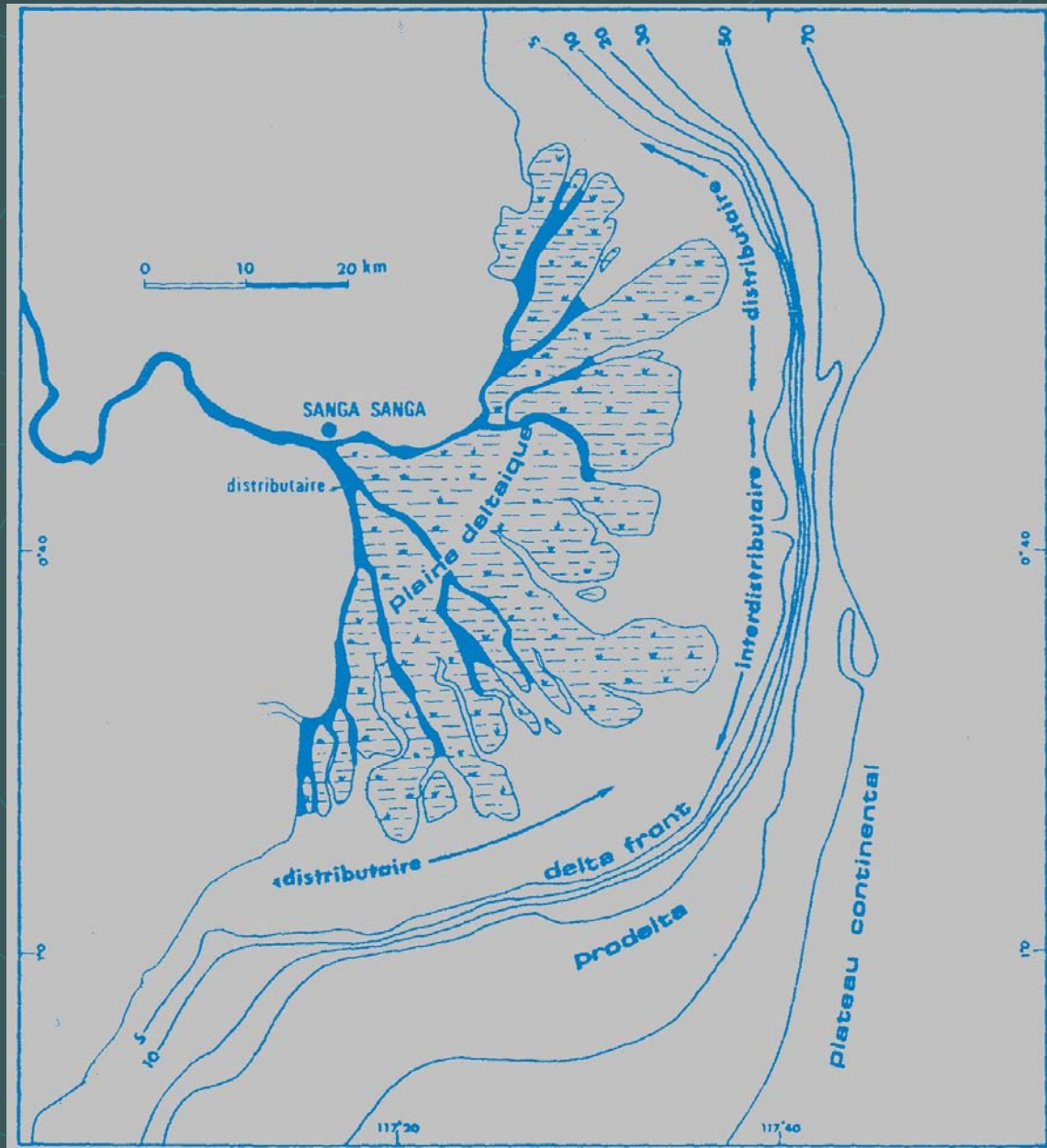
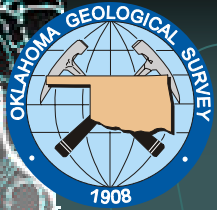
**Mahakam Delta
(Modern Analog)**

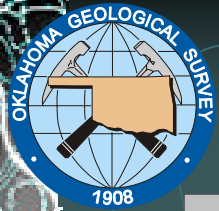
Oklahoma



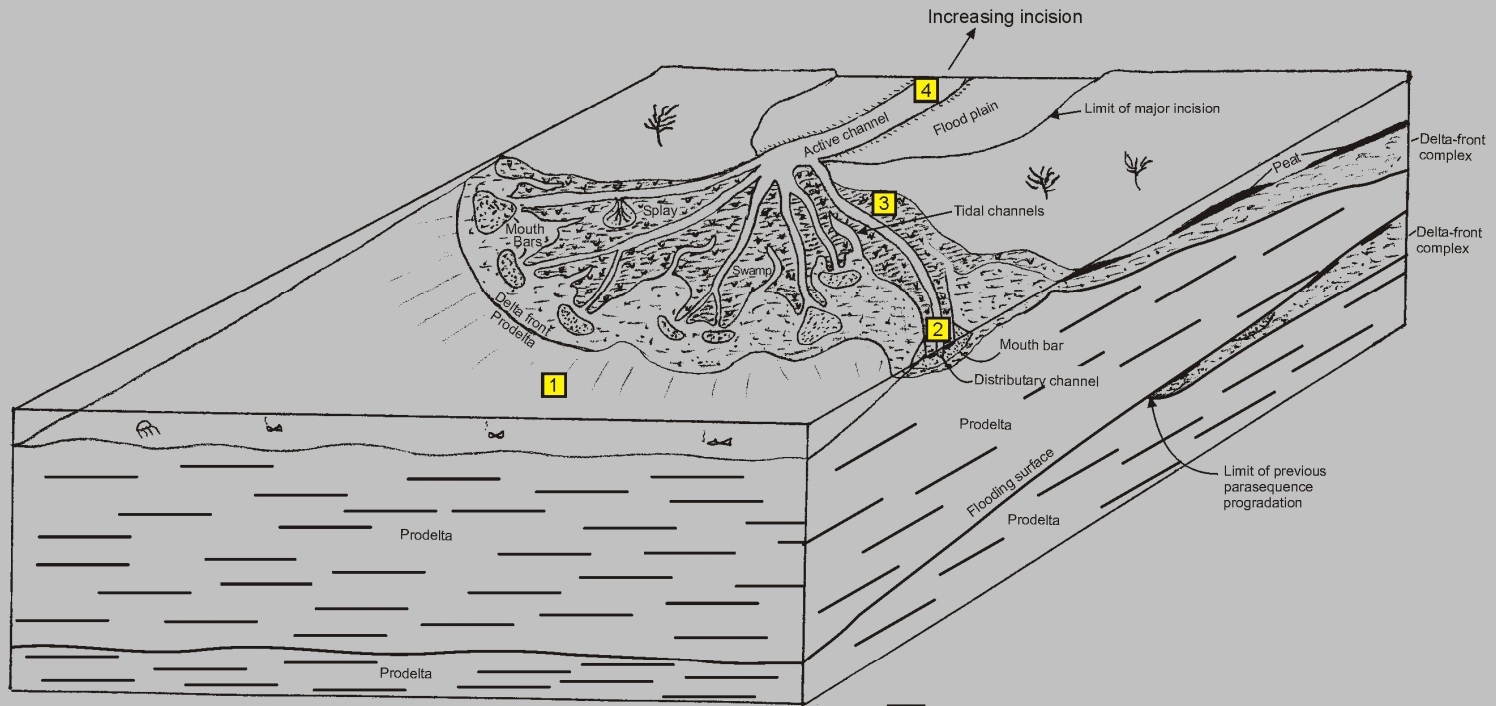
**Pennsylvanian
Paleogeography**

Mahakam Delta





Idealized Booch Tidal Delta



1

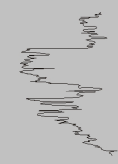
2

3

4



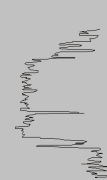
Predelta shale
PS-4



Distributary channel
on mouth bar
PS-3/3A



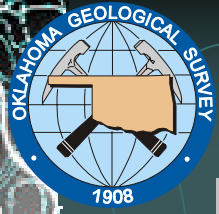
Interdistributary bay-fill/swamp
upper PS-0



Stacked channel fill
PS-2

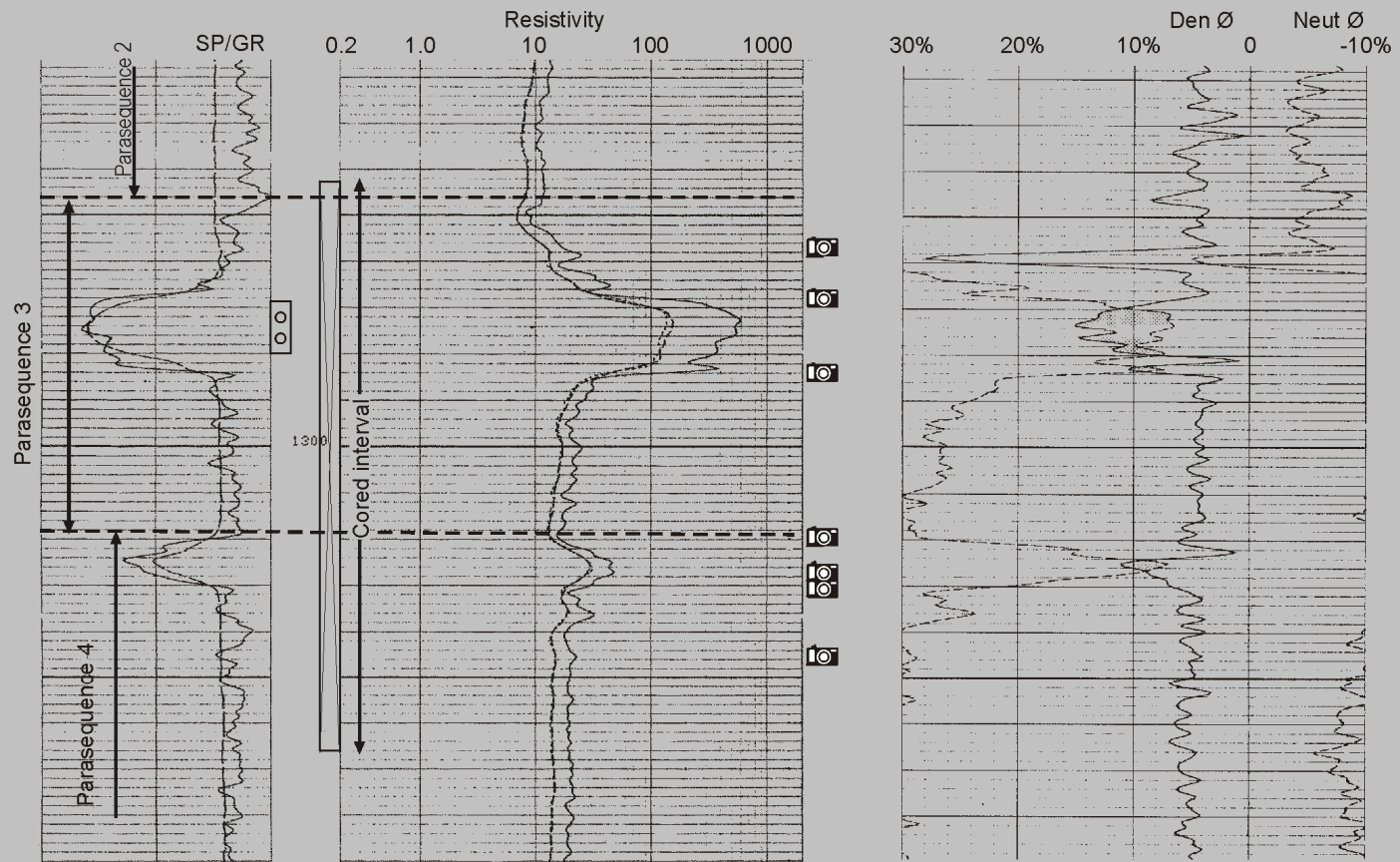
All Log shapes are from Plate 14, well #5

Eberly & Meade
Lake #3-5
NW NW Sec 5-6N-16E
KBE:614'

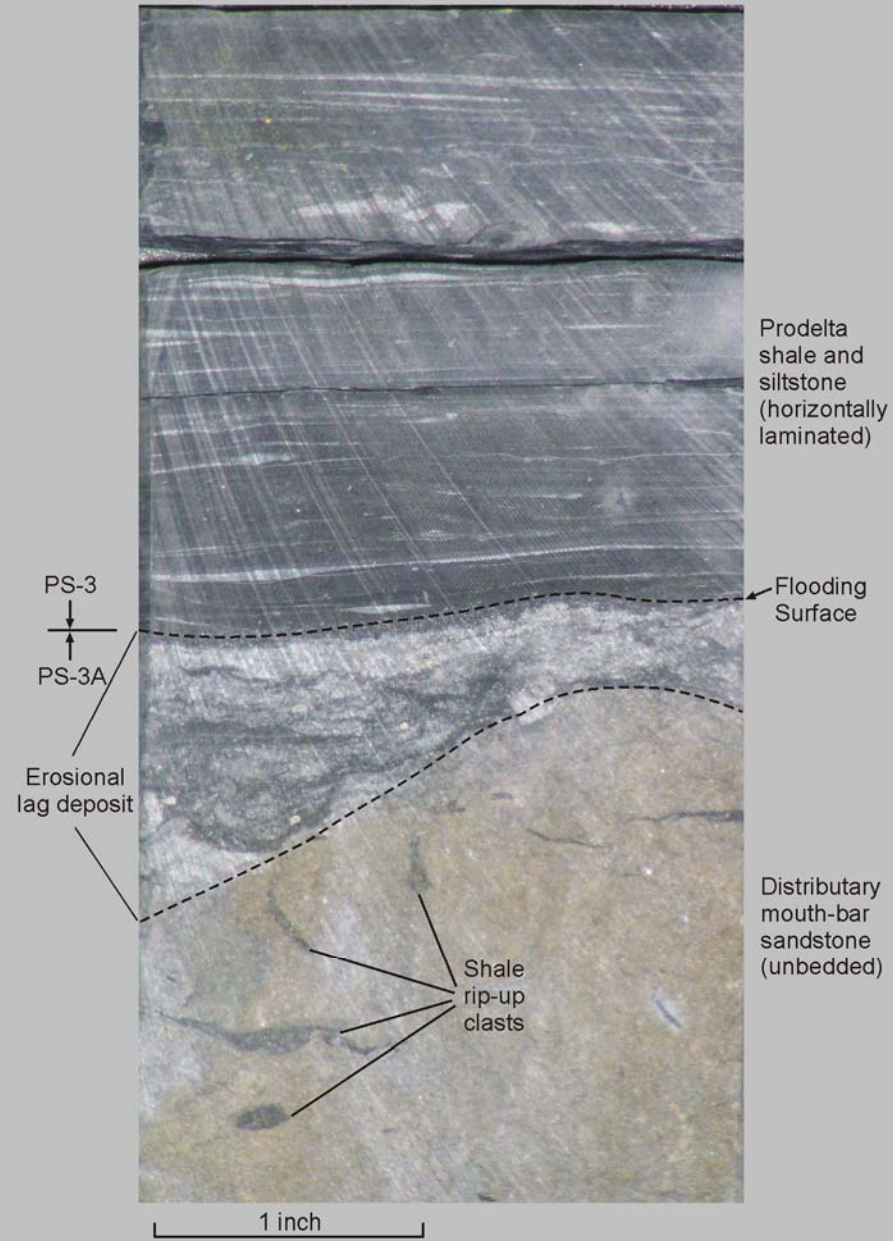
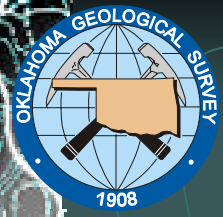


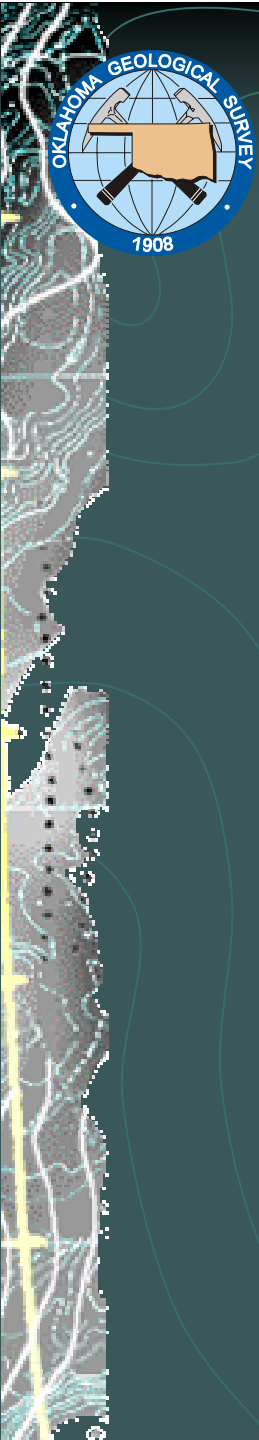
APPENDIX 4
McKee B-1
TD 1745'
Comp. Date 3/82

Photos-



McKee #B-1
1,319'





McKee #B-1
1,284'



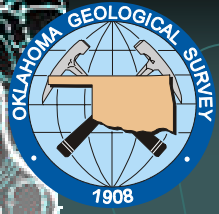
1 inch

← Current directions

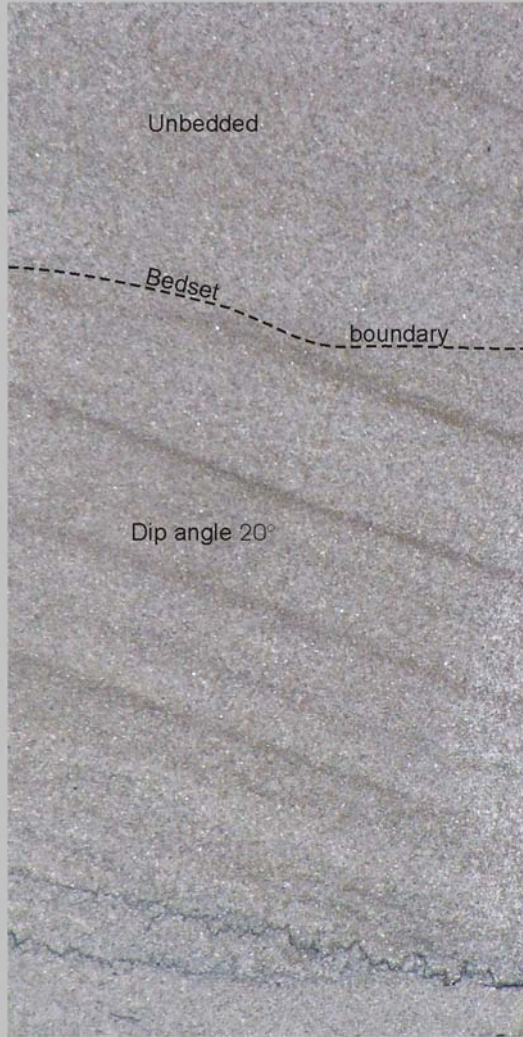


Wildhorse Mountain Outcrop (PS-3/3A ? Warner)

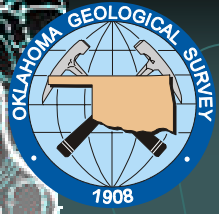




McKee #B-1
1,268'



1 inch



McKee #B-1
1,257'

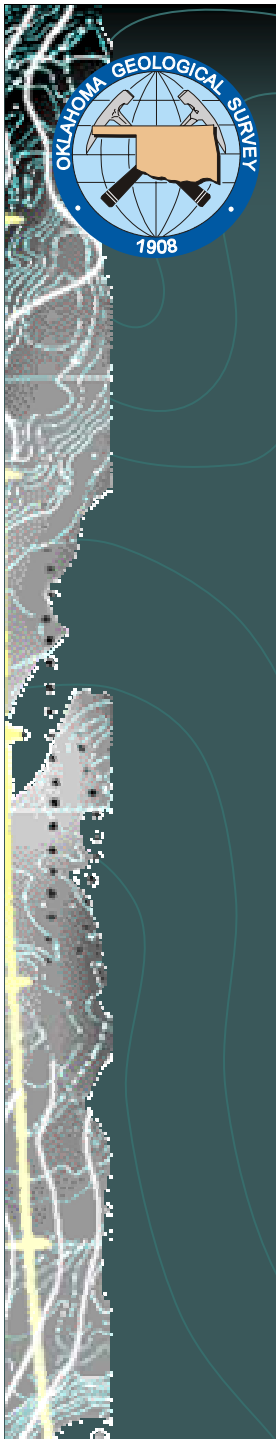


Coal

Coal

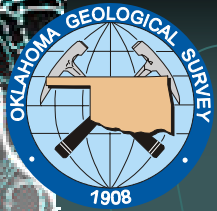
Coal

1 inch

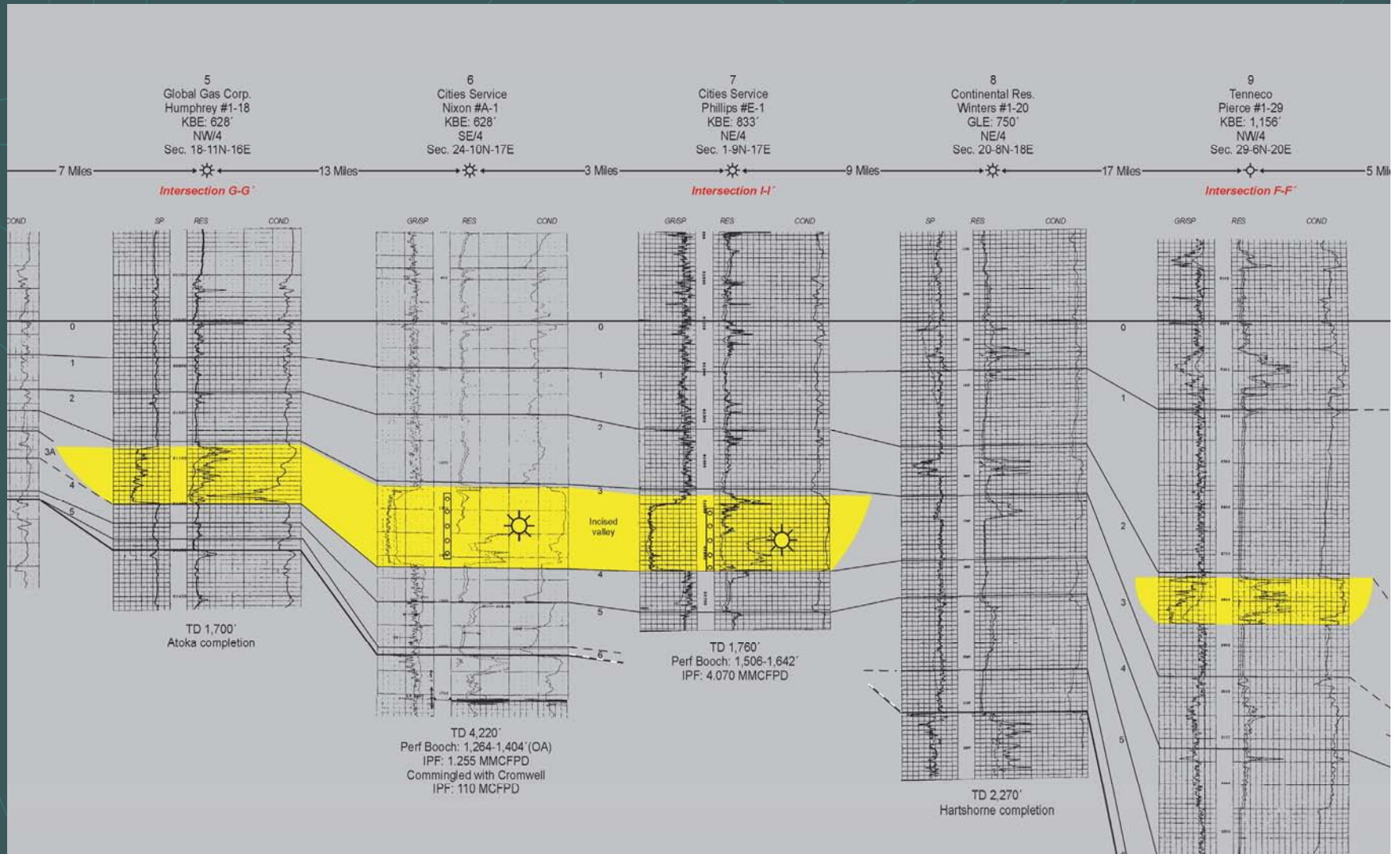


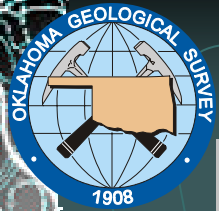
The Booch Gas Play

Haileyville Railroad Outcrop PS-3 (Warner)

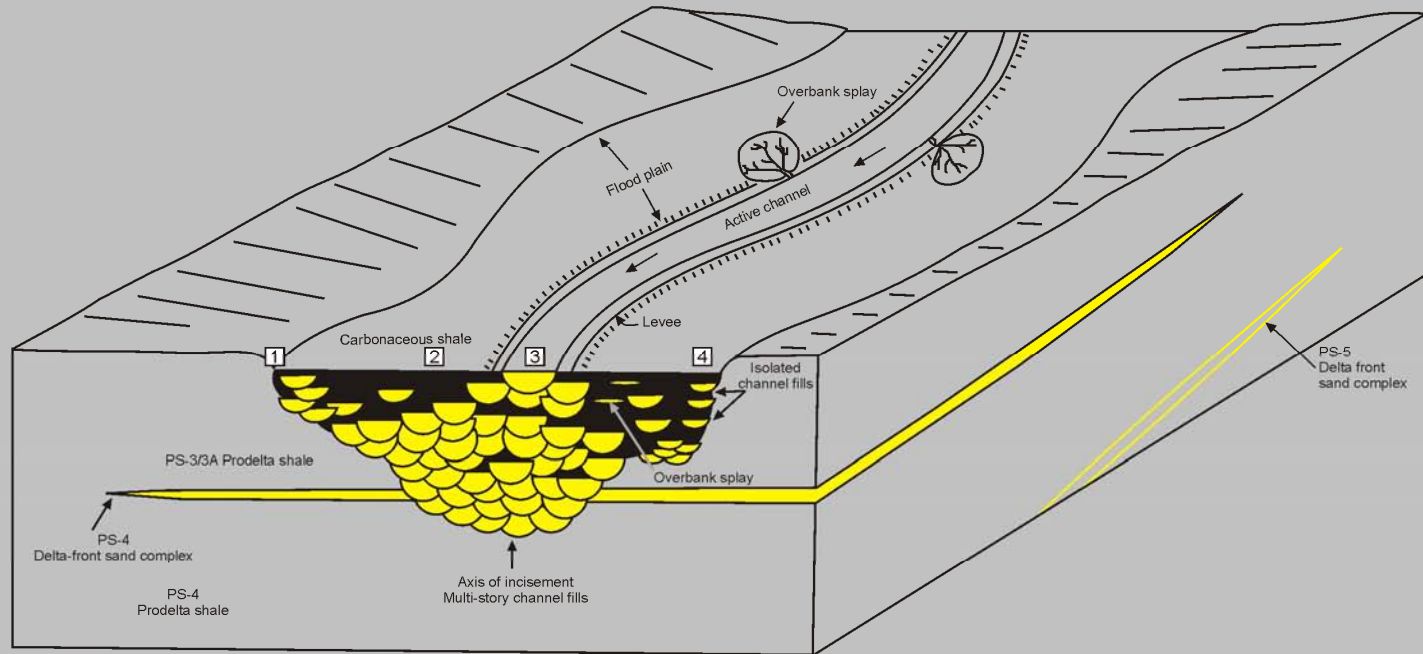


Booch Regional Cross-Section B-B'

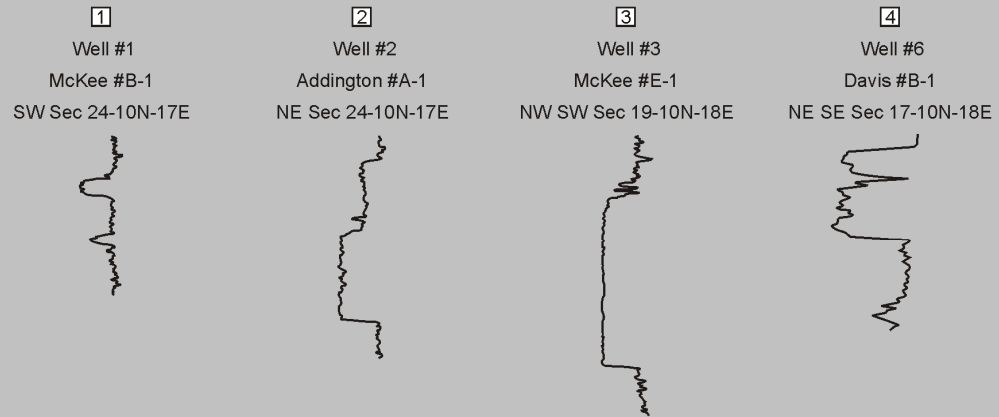




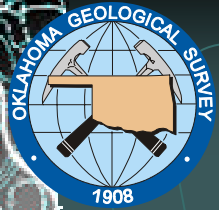
Incised Valley Block Diagram



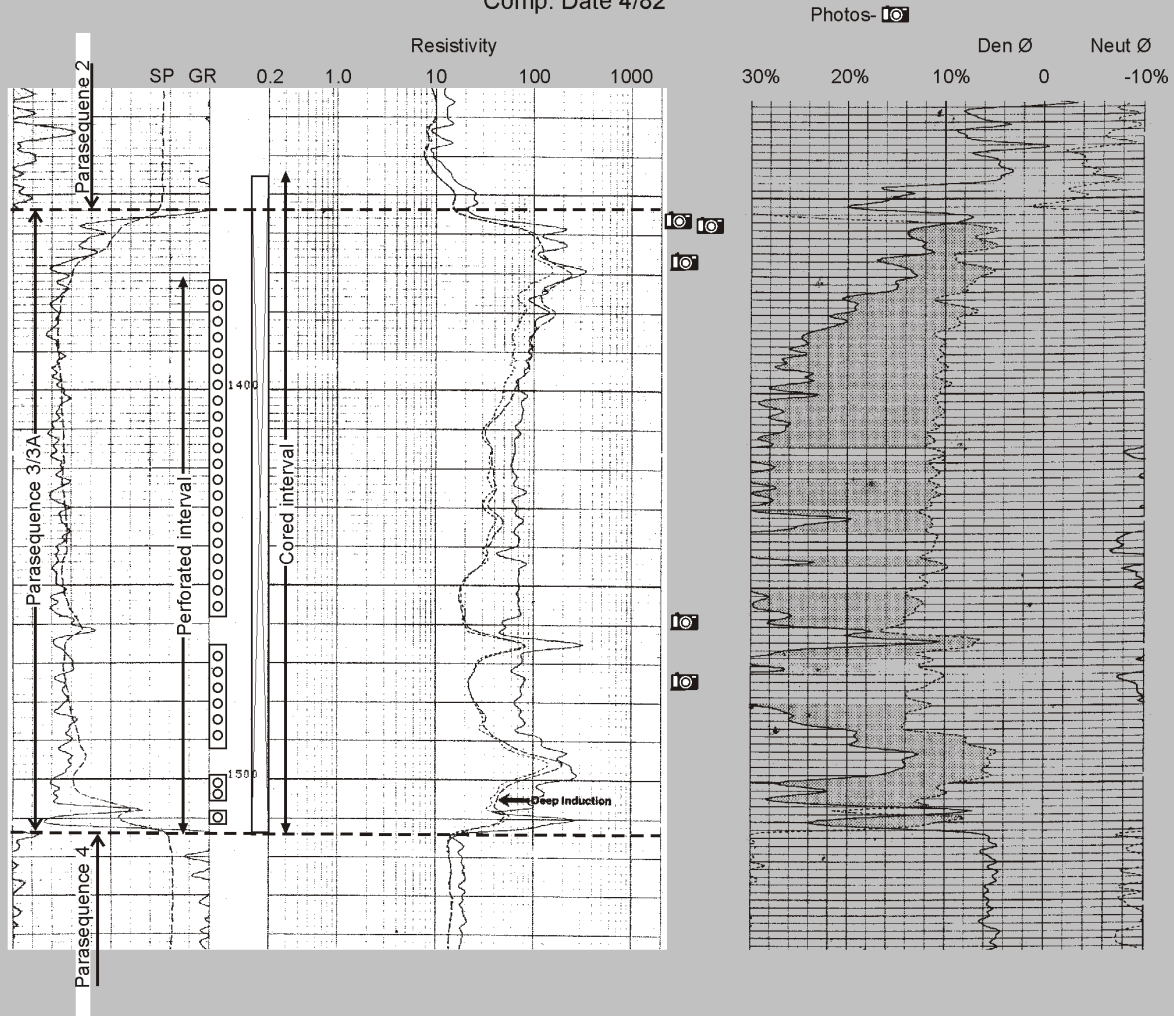
Log signatures from cross section A-A' (Plate 10)

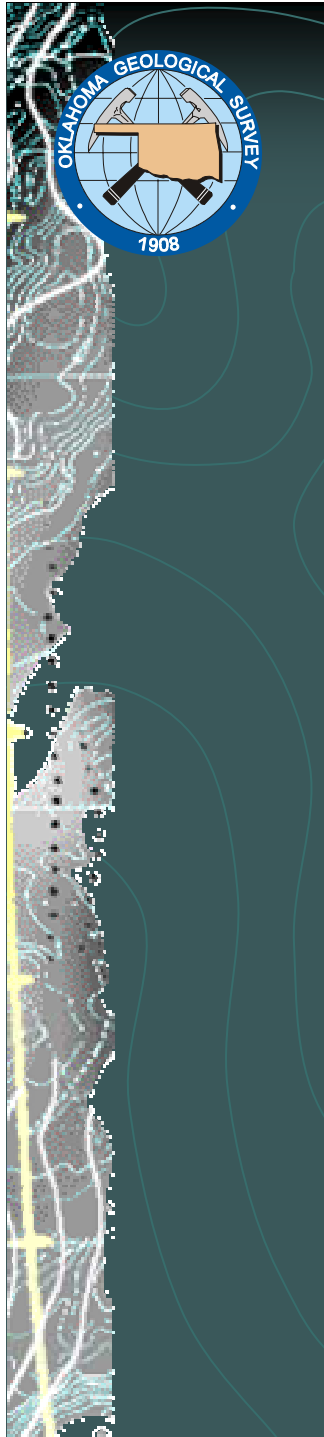


Brooken Field Booch Core



APPENDIX 4
Mason A-1
TD 1609'
Comp. Date 4/82





Mason #A-1
1,355'



PS-2
↓
—
↑
PS-3/3A

← PS-2 flooding surface

Sandstone (horizontally laminated)

Channel-fill sandstone

Sandstone (unbedded)

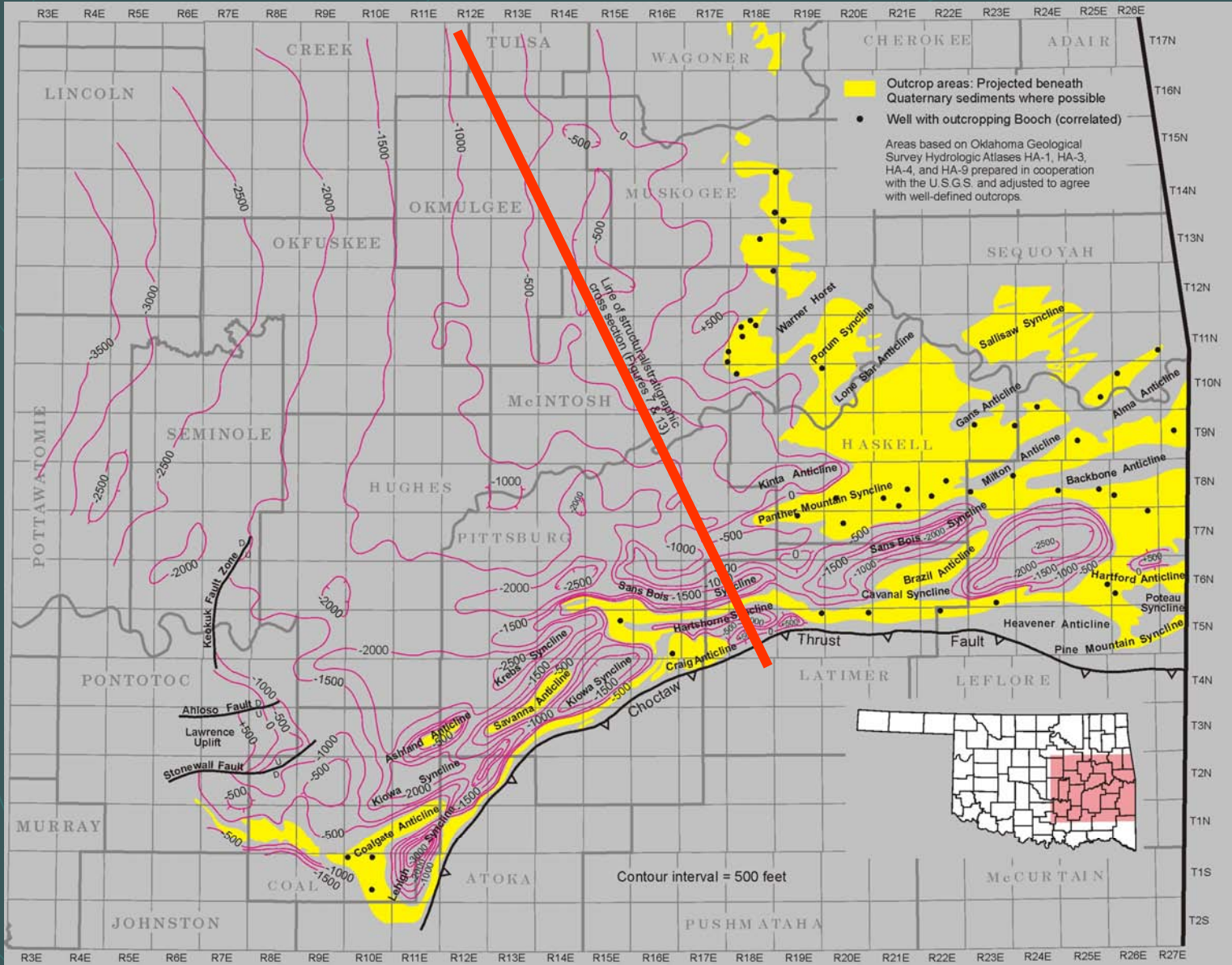
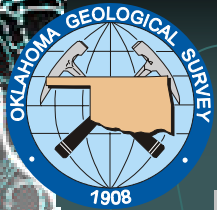
1 inch

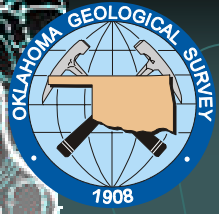
The Booch Gas Play



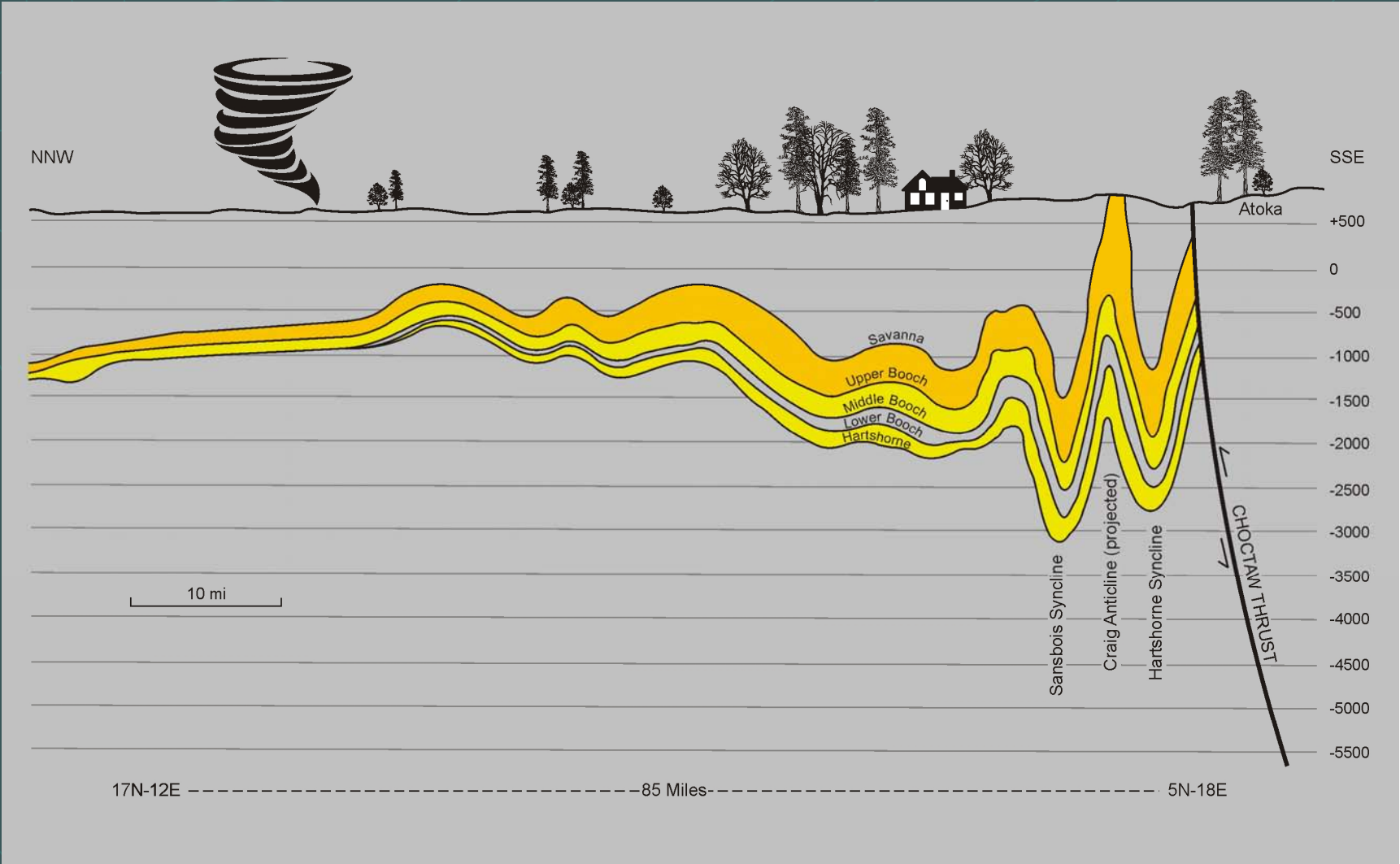
Regional Mapping

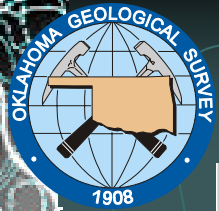
Structure: Top Booch



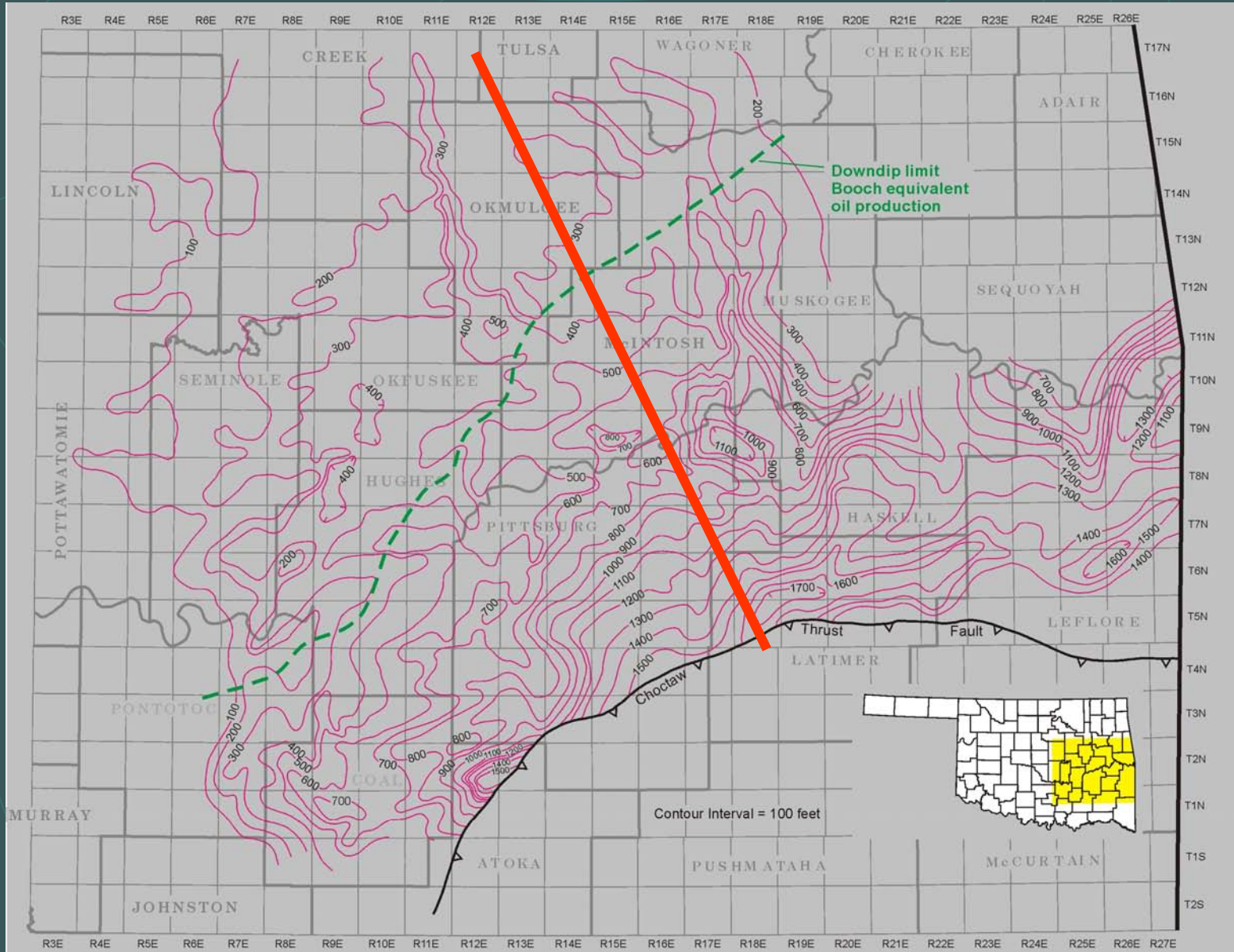


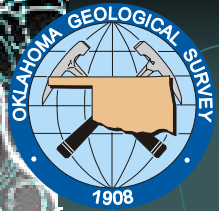
Regional Structural Cross-Section



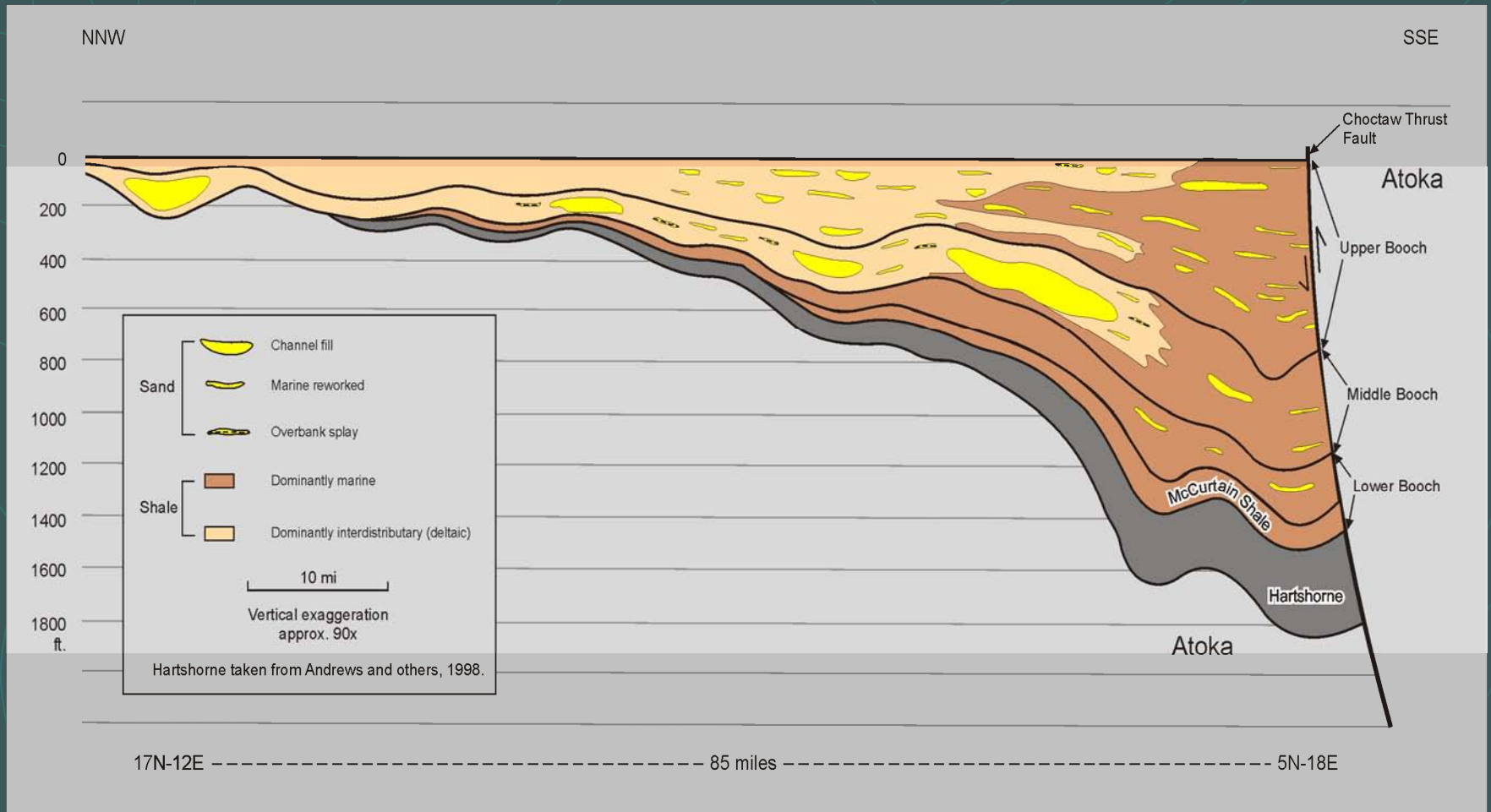


Booch Gross Interval Isopach

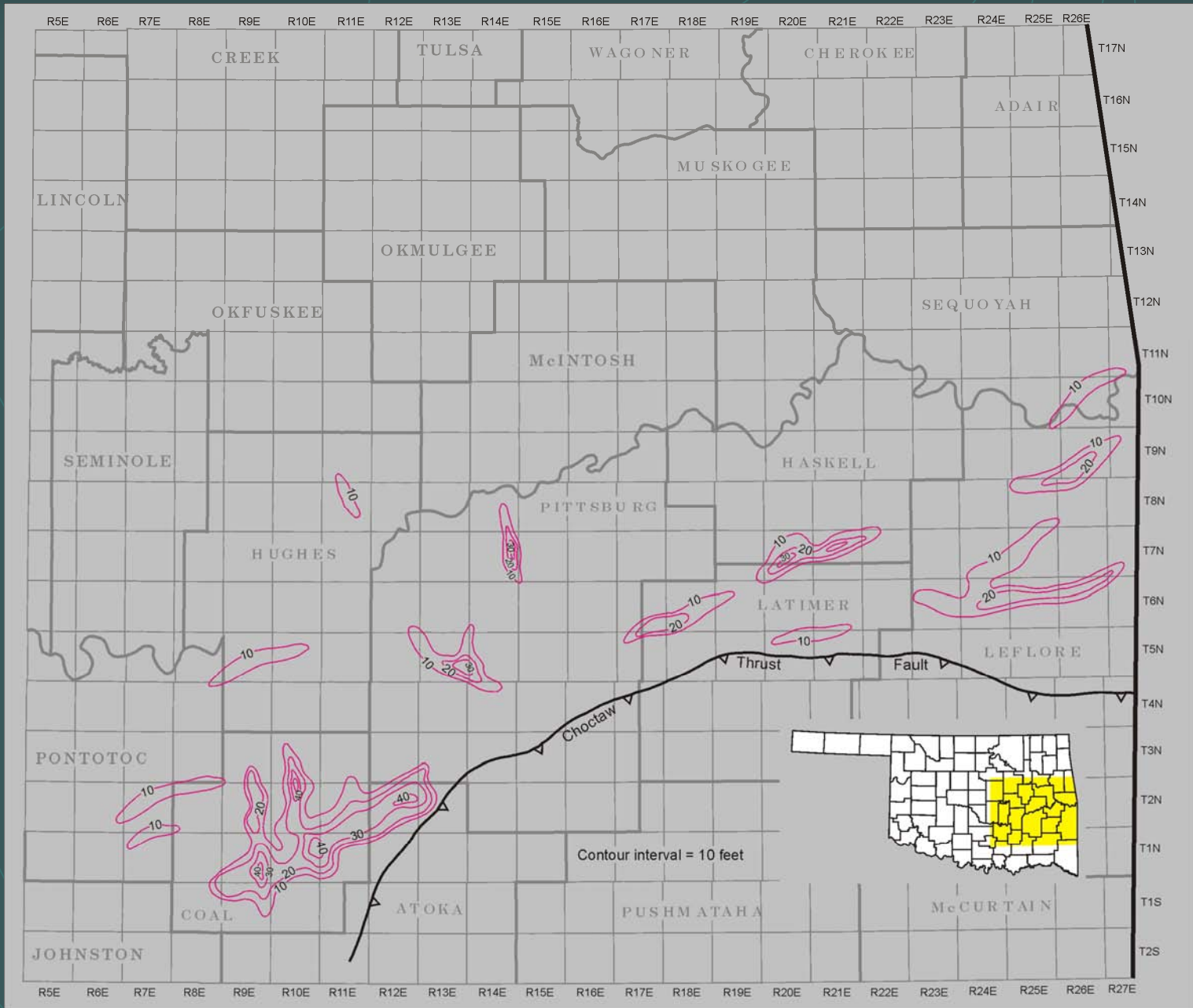
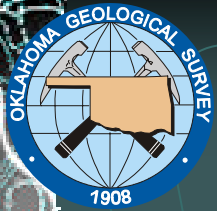




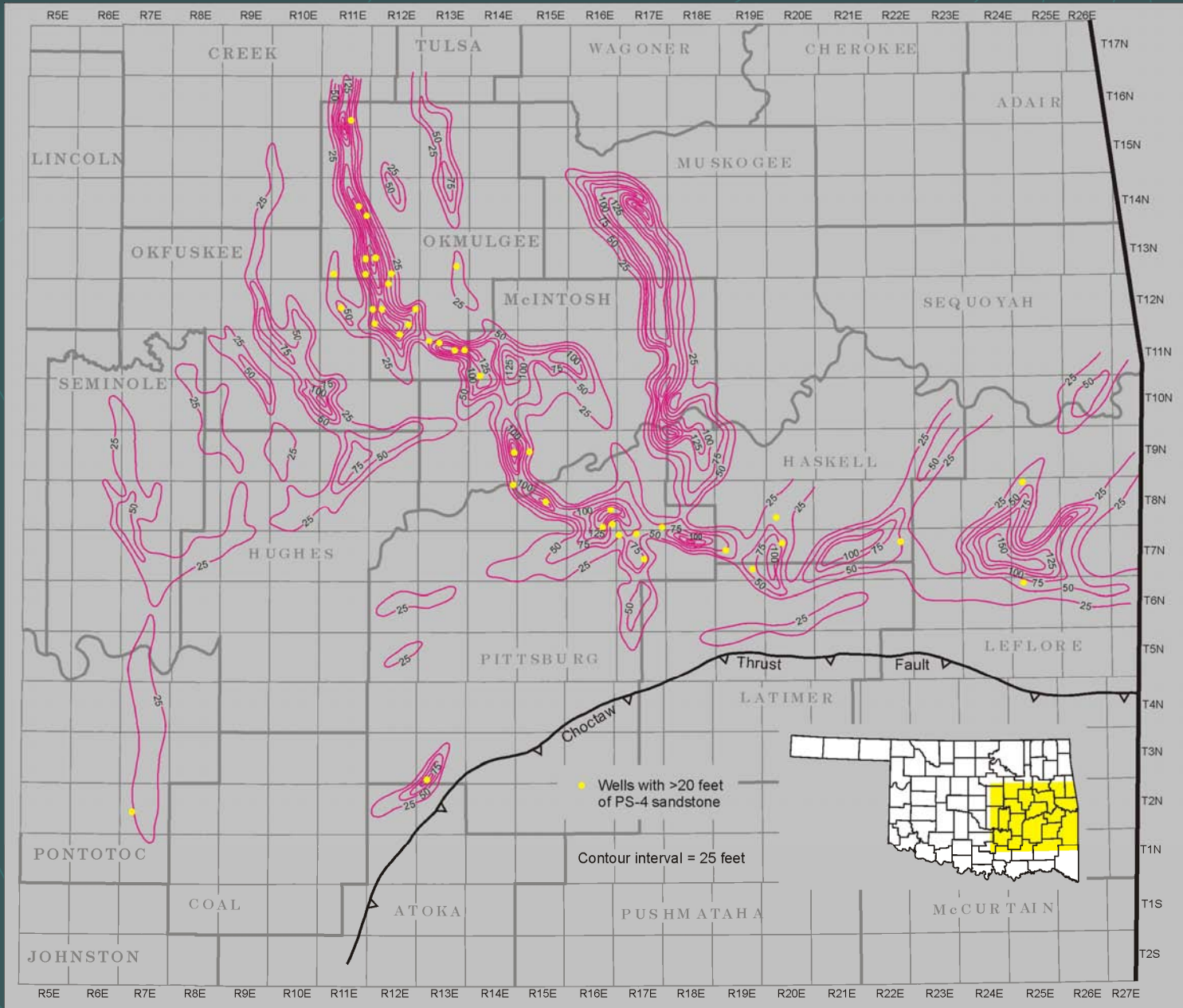
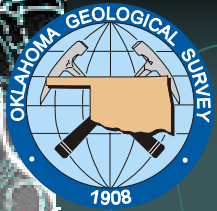
Regional Stratigraphic Cross-Section

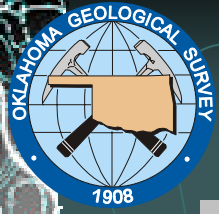


Lower Booch (PS-5) Gross Sand Isopach

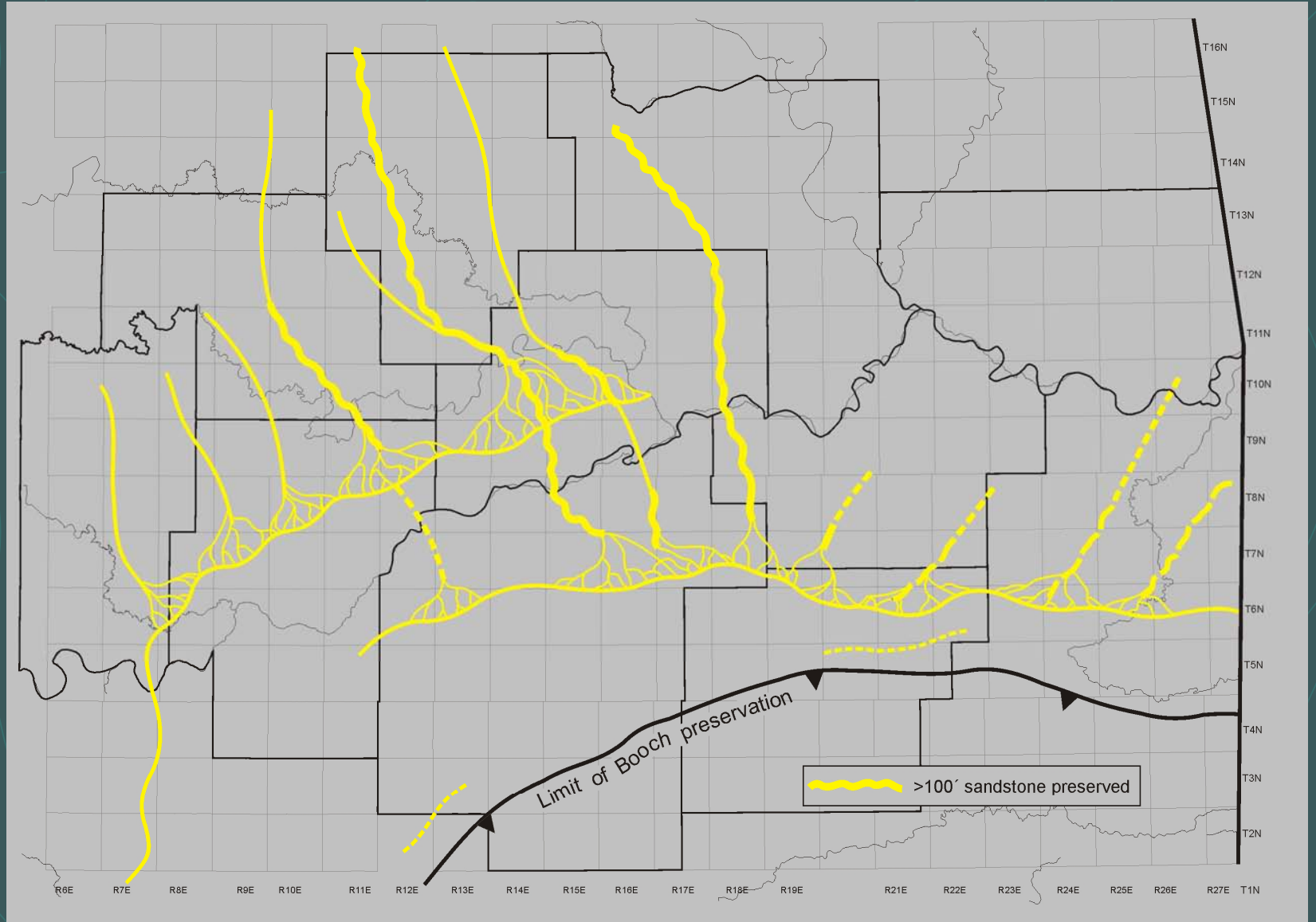


Middle Booch Gross Sand Isopach

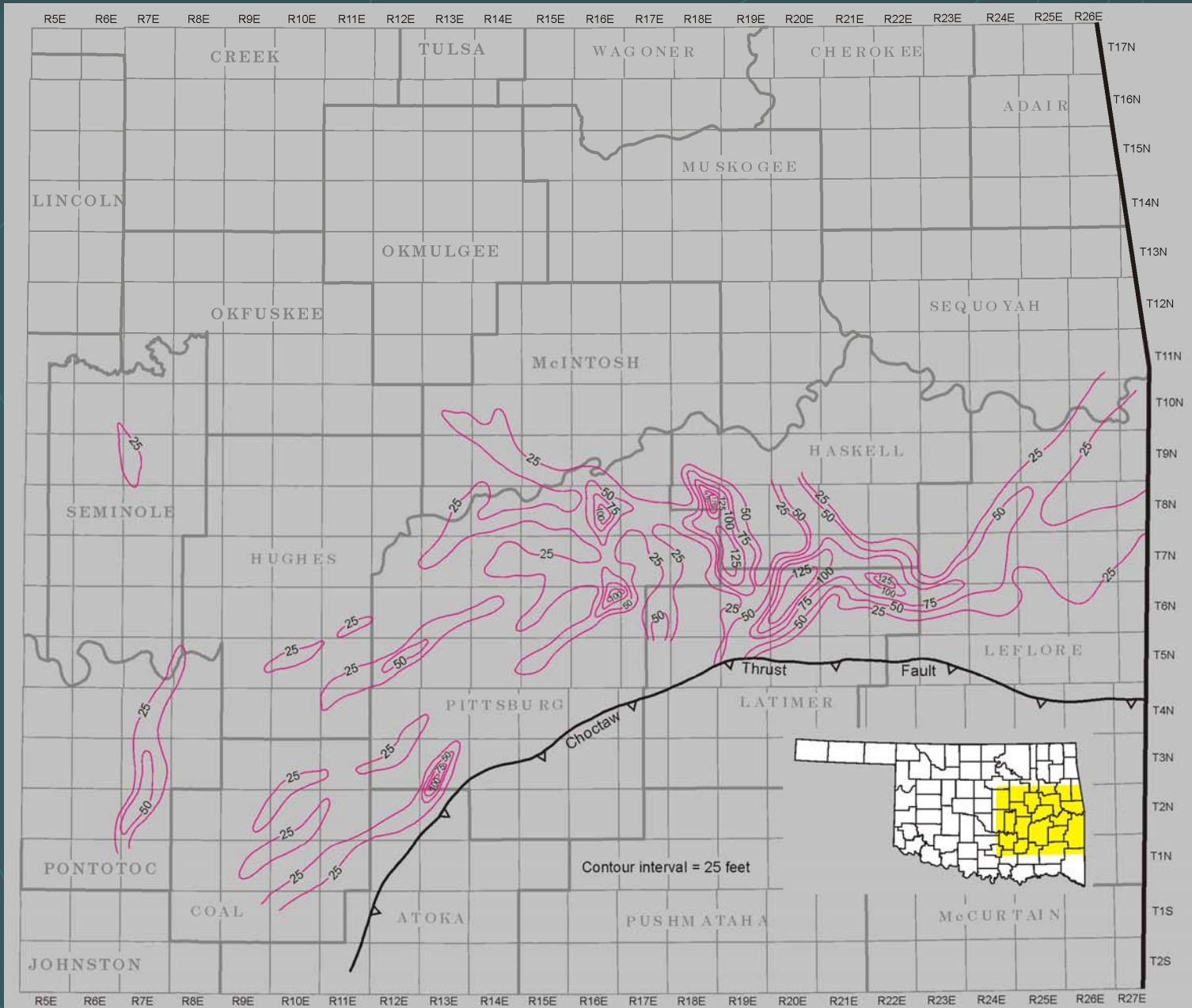
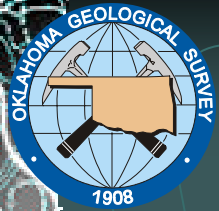


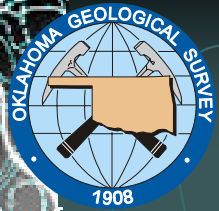


Schematic Middle Booch Depositional Systems

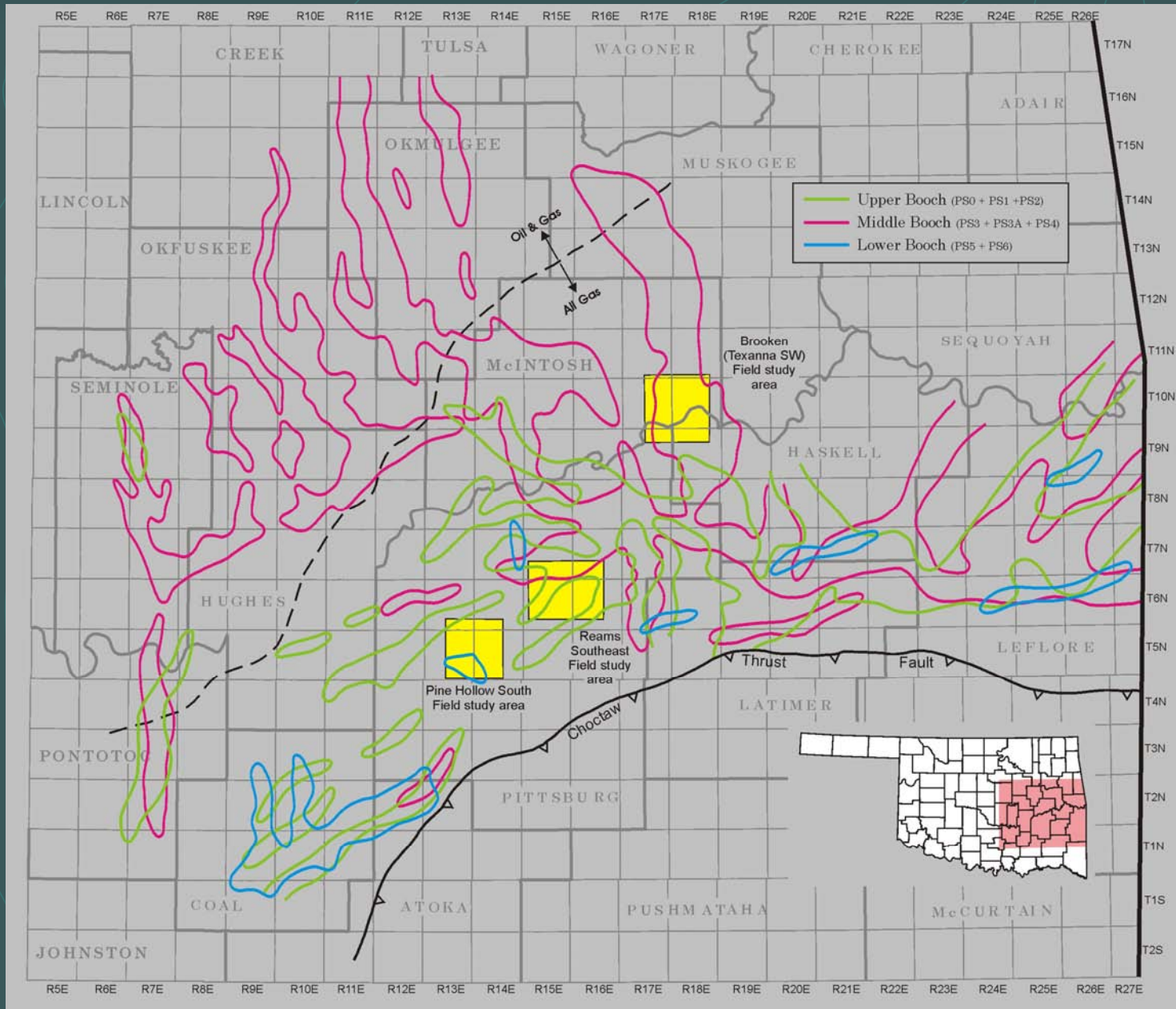


Upper Booch Gross Sand Isopach



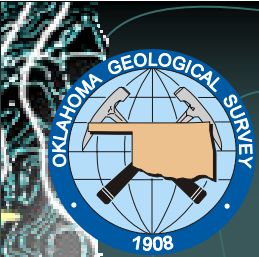


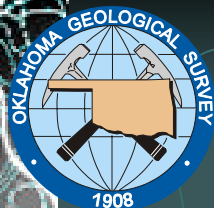
Booch Gross Sand Isopach



Conclusions

- Booch not equivalent to McAlester
- Records eight progradational cycles (all sourced from the north)
 - Lower Booch (2 cycles) most marine & poorest producer
 - Middle Booch (3 cycles) maximum progradation & best producer
 - Upper Booch (3 cycles) intermediate
- Reservoirs all sandstones (occurring near cycle tops)
- Booch marine shales and coals are the dominant source rocks
- Migration largely short-distance
- Stratigraphy the key to economic entrapment





New Spiro Lake Dam Spillway PS – 3/3A

