



CONCORDE
ENERGY, INC



Paris Basin France

A Potential

Multi-billion barrel

Oil resource

SPEE Luncheon

April 10, 2013

Denver, Colorado



“Progress in prospecting....sometimes seems slow and the results all too meager in proportion to the money that has been spent, but wildcatting is likely to continue for many years because something is always turning up to sustain the interest.”

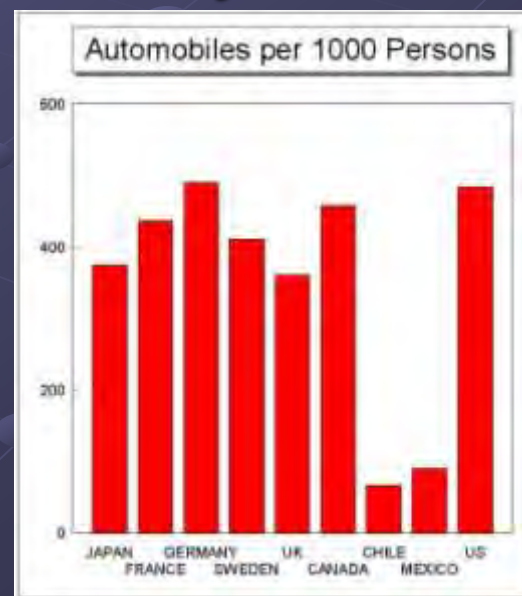
E. L. Estabrook, 1924

Paris Basin Oil Resource Play

- New oil resource play in Europe
- Rich type II source rock section – basin models suggest over 1,000 BBO generated in basin (high API gravity, low viscosity)
- Stratigraphy and lithology similar to successful analog plays (Bakken)
- Multiple objectives – conventional and unconventional
- Geology and geochemistry of objectives are well documented by regional studies
- Wells drilled for deeper objectives have ubiquitous oil indications in source rock intervals. Recent competitor activity reports positive result.
- Very attractive fiscal and political environment (historically)
- Premium market
- Large contiguous land blocks with excellent term.
- Rural environment – operations feasible

France Facts

- GDP \$2.77 Trillion (3rd largest EU)
- Oil Production 72 MBO/day (4.1%)
- Oil Imports 1,666 MBO/day (95.9%)
- Refining Capacity 1,800 MBO/day
- Unemployment 10.9%
- Population 63.1 Million
- 29.6 Million cars
- Over 5 Million trucks



Paris Basin Vision



Unconventional Oil Plays are not possible without application of *advanced technology*.

The recurring theme among the visionary companies active in these extraordinary plays is revisiting previously maligned areas and applying *new drilling and completion techniques*.

The key to reach *repeatability and economic productivity* is when a certain technique fails, we gain new knowledge and try the next innovation.

Paris Basin Characterization

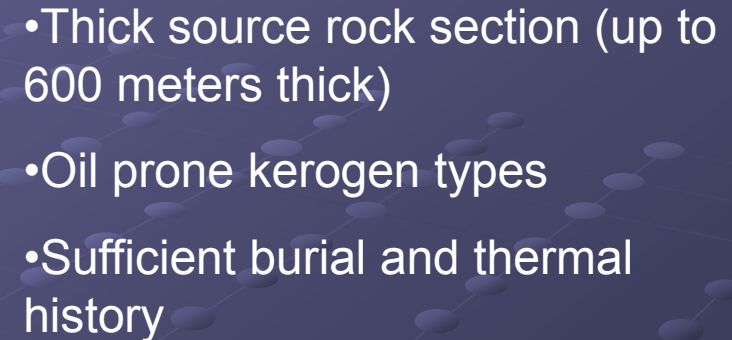
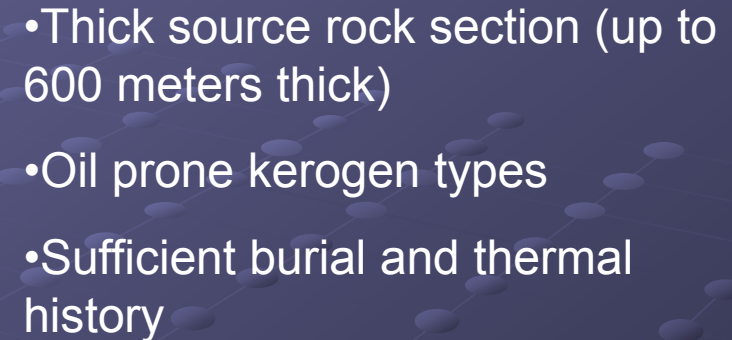
1 meter = 3.28 feet

1 metric ton = ~ 7.15 Barrels (oil)

- Simple structural setting
- Extensional tectonic regime
- Thick Jurassic source rock section
- Under-explored oily basin
- Unconventional plays unexploited



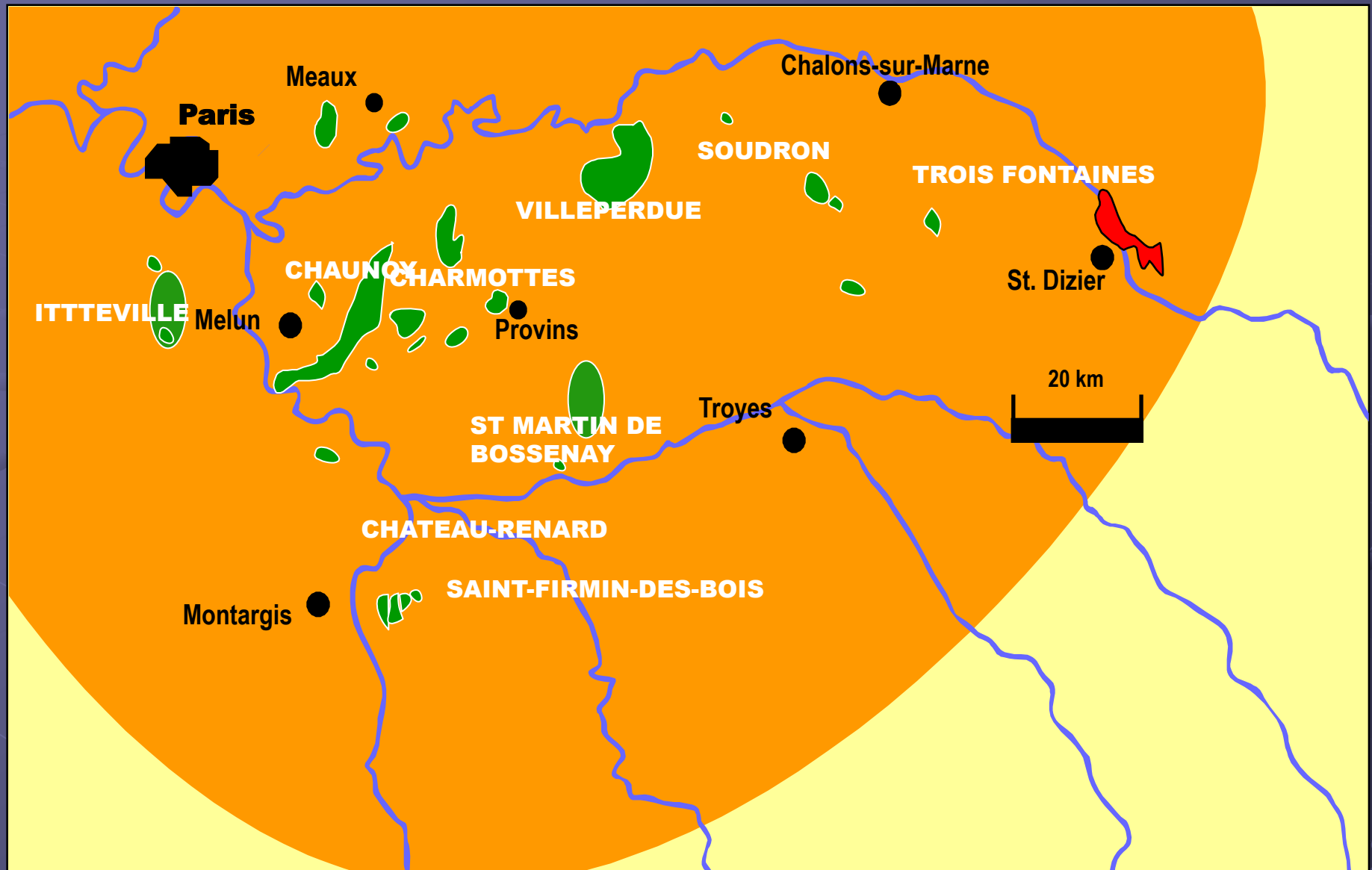
CLASSIC SOURCE ROCKS CHARACTERIZATION



Paris Basin Regional Geology

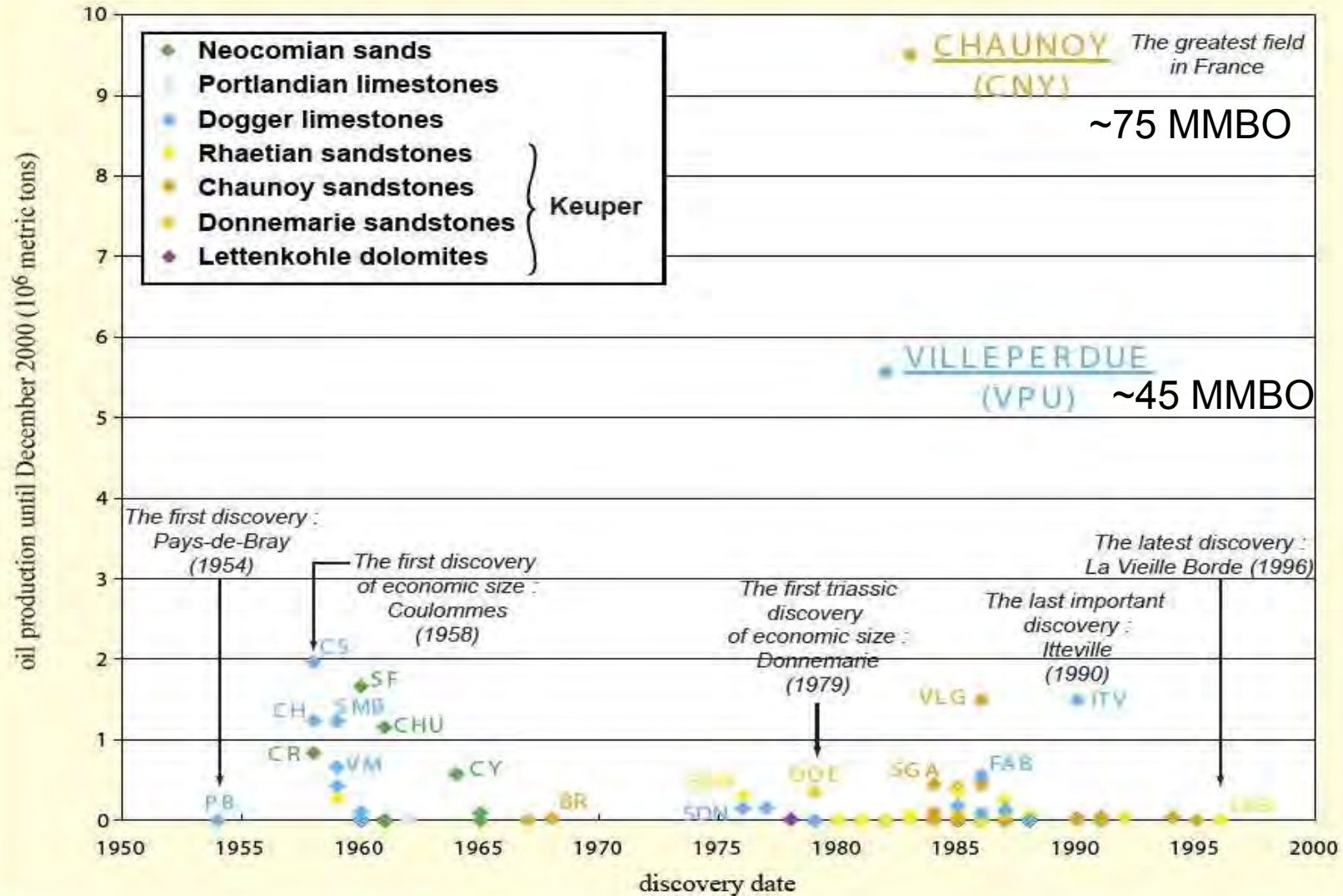
- Intracratonic basin formed due to down-warping associated with crustal cooling.
- The Basin was dominated by extensional forces from Permian through Jurassic time, compression shortening began in the Cretaceous and continued into the Tertiary.
- Marine sedimentation began in the Permian and continued into the Tertiary.
- More than 3000m of sediments have accumulated in the Basin center.
- Hydrocarbon exploration began in the mid-20th century.
- Significant oil reservoirs have been discovered in conventional traps, structural and stratigraphic, from the Triassic Keuper sands, Jurassic Bathonian carbonates and Cretaceous Neocomien sands.
- Lightly explored by world standards, there have been less than 1000 exploration wells drilled in the basin. Only 30% have actually penetrated the Liassic. (Paris Basin covers an area the size of Ohio)

Paris Basin Oil Fields

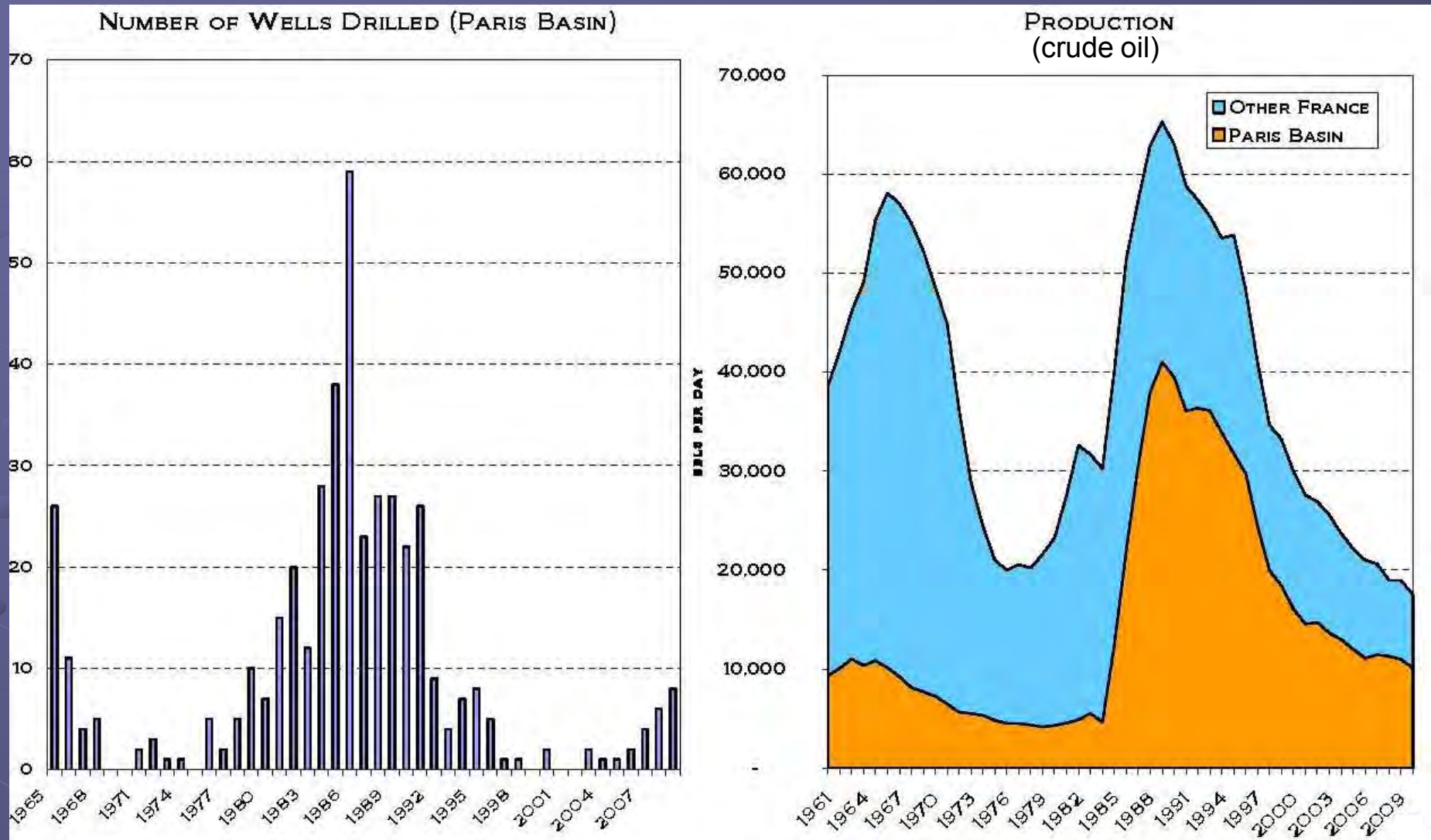


Paris Basin Petroleum Development History

1 - CUMULATIVE OIL PRODUCTION VERSUS DISCOVERY DATE

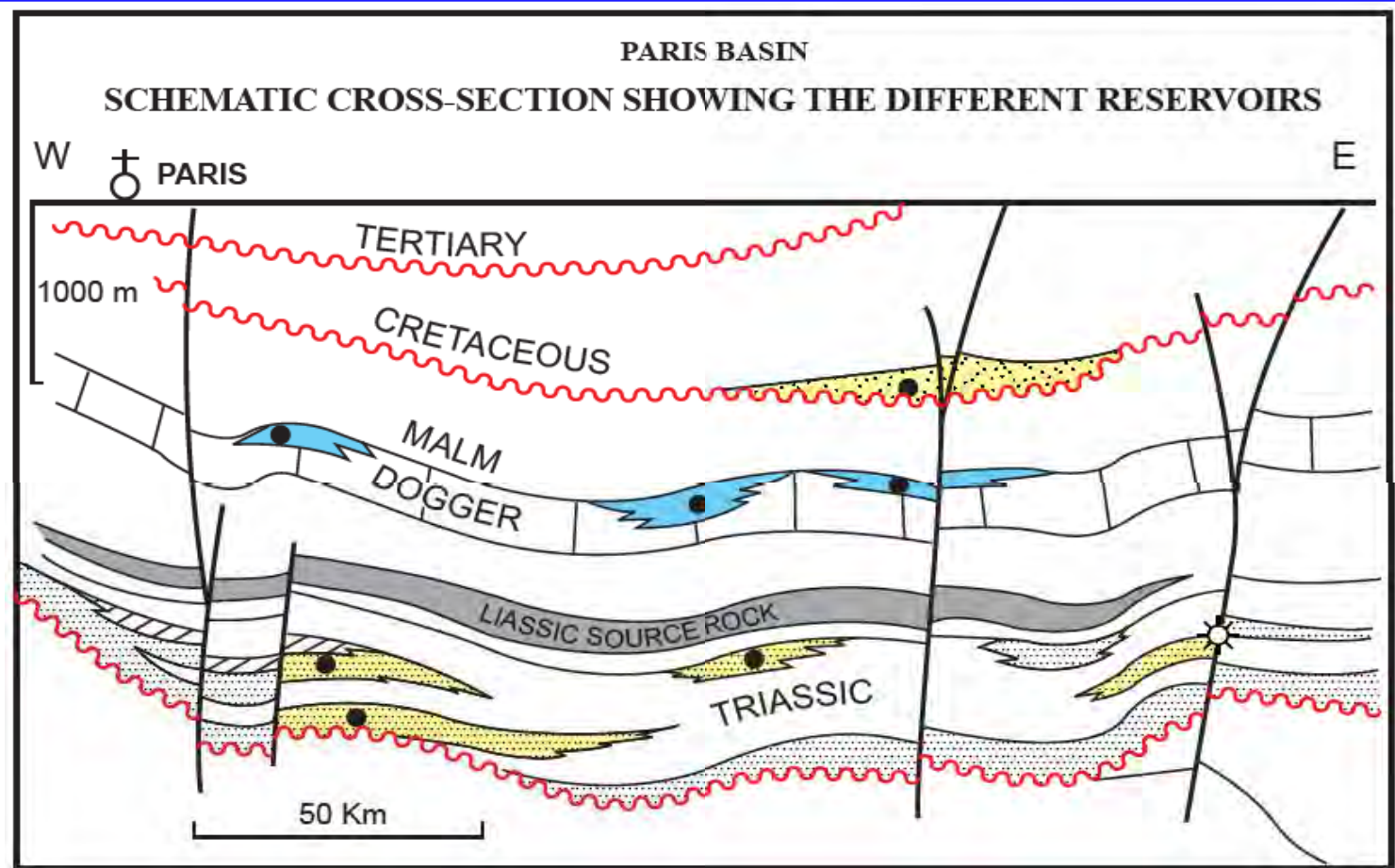


Paris Basin Petroleum Development History



Under-explored basin – Conventional and Unconventional Objectives

Paris Basin Hydrocarbon Habitat



(After Bacchiana et al., 1994)

Paris Basin Stratigraphic Column

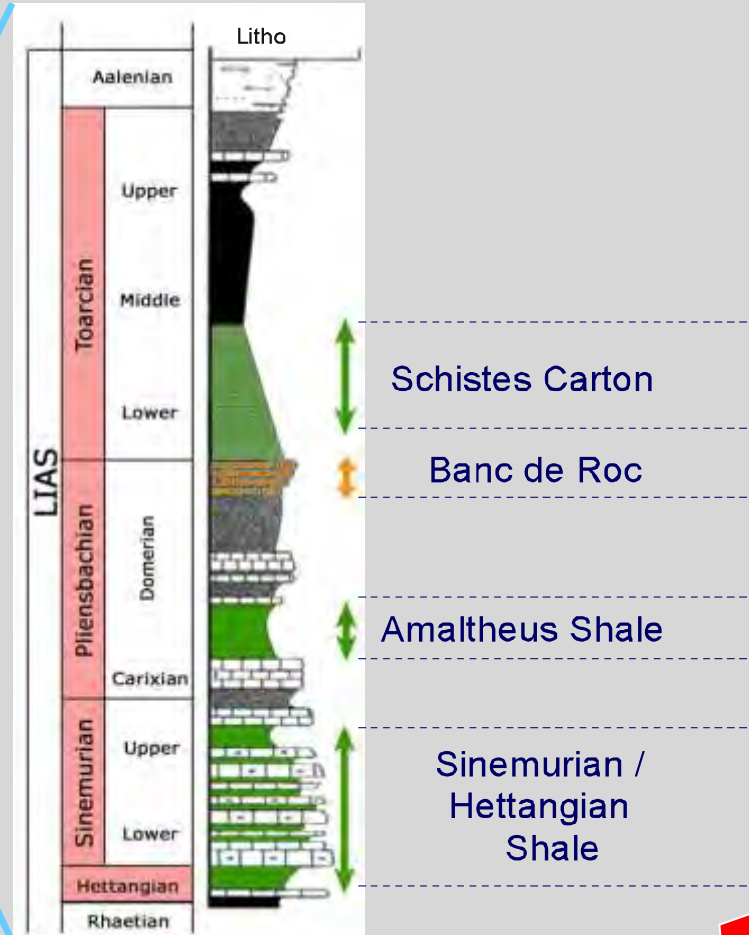
ERA	PERIOD	EPOCH	Reservoirs and source rocks	LITHOLOGY
CENOZOIC	EOCENE OLI-GOCENE			
MESOZOIC	CRETACEOUS	UPPER		
	LEMP		Neocomian Sandstones	
	MAU			
	DOGGER		Dogger Carbonates	
	LIAS		Liassic source rocks	
PALEOZOIC	TRIASSIC	TRIASSIC	Keuper silici-clastic	
	MUSCHEL			
	SAVO			
	STEFANIAN			
	WESTPHALIAN			

Neocomian Sandy reservoir

Dogger carbonate reservoir

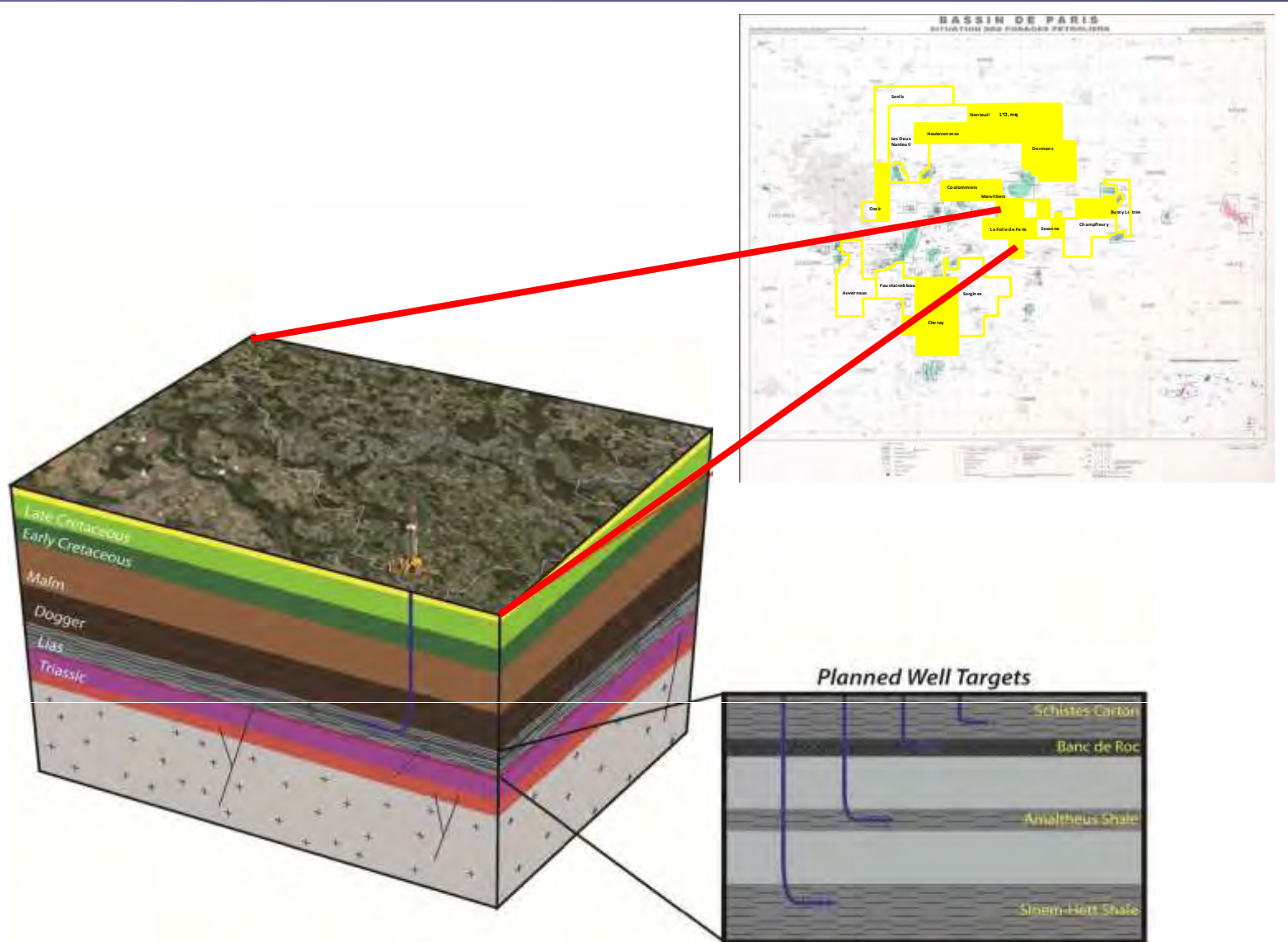
Liassic source rock

Keuper silici-clastic reservoir

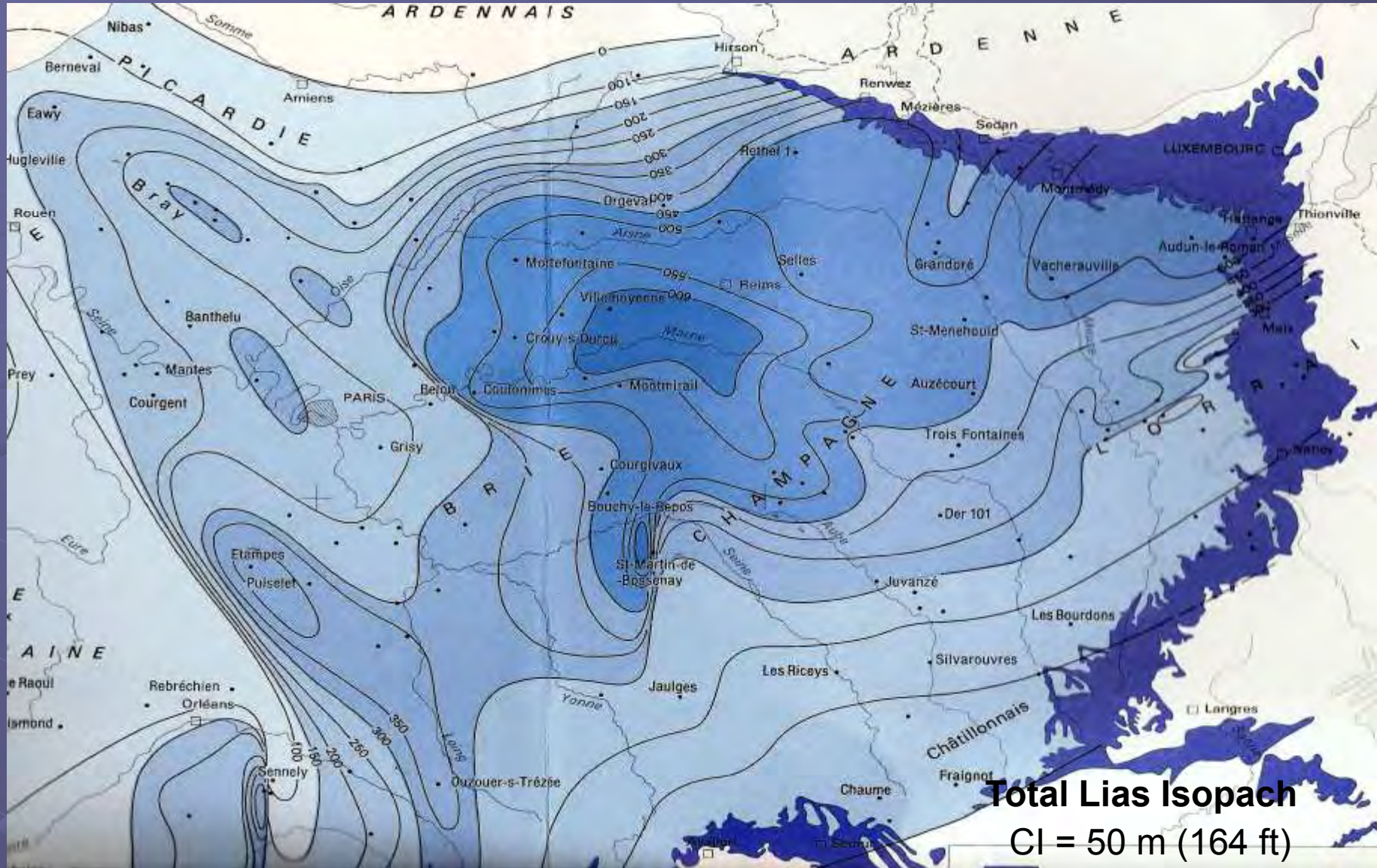


Multiple source rock intervals interbedded with carbonates !!!

Notional Evaluation Targets

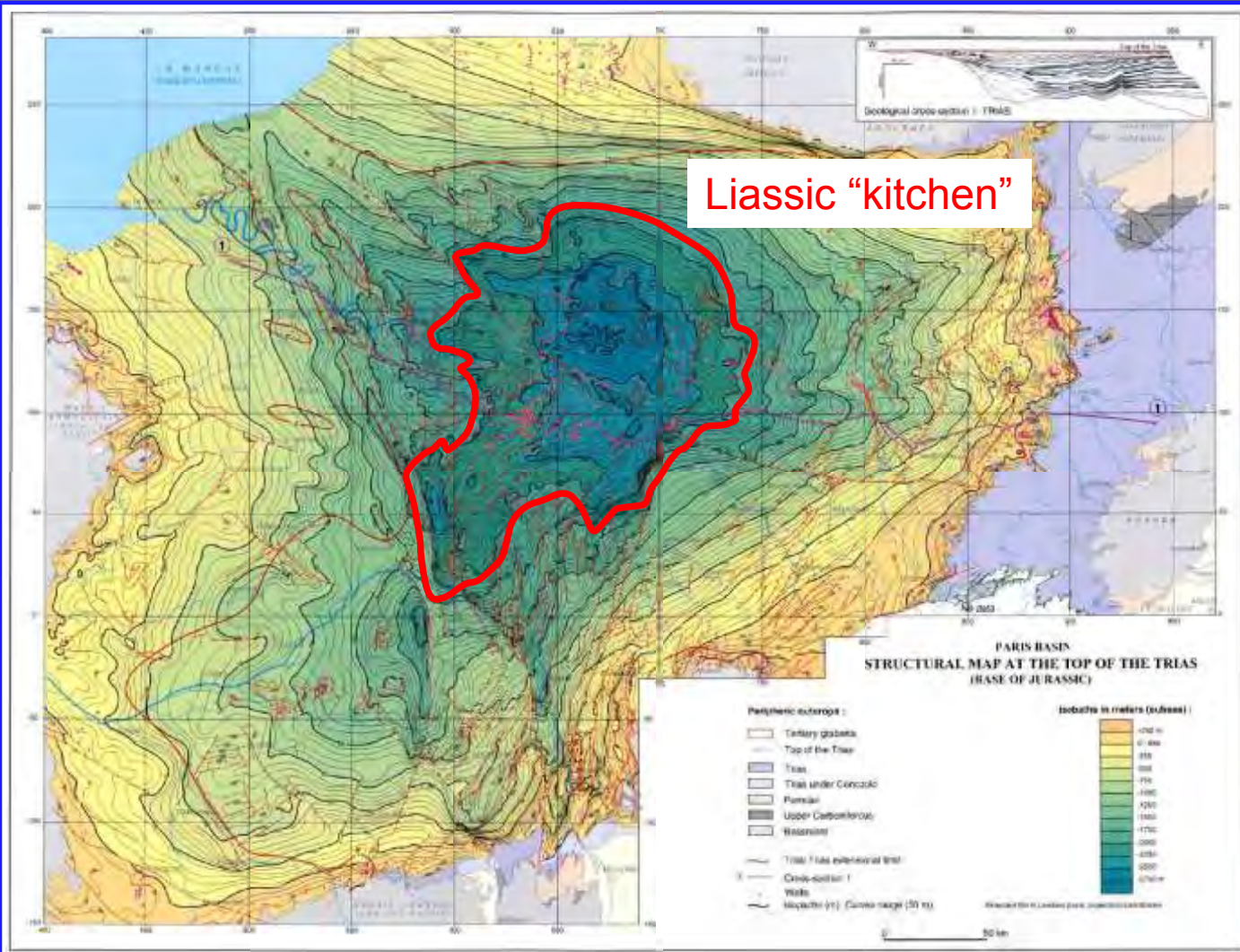


Paris Basin Liassic Isopach



Thick (up to 2,000') source rock interval

Paris Basin Base Jurassic Structure Map



Structure
provides proxy
for source rock
oil maturity
window

**PARIS BASIN
LOWER TOARCIAN SOURCE ROCK
(Schistes cartons, T3, Serpentinum zone)
ORGANIC MATTER Tmax MAP**

Periphratic outcrops :

- Tertiary grabens
- Top of Lower Dogger (Malmian)
- Lower Dogger-Upper Lias
- Lower-Middle Lias
- Top of Tria
- Tria
- Permian
- Upper Carboniferous
- Eocene

Iso-Tmax values :

- ≤ 430°C
- 430-435°C
- 435-440°C
- 440-445°C
- 445-450°C
- > 450°C

Legend:

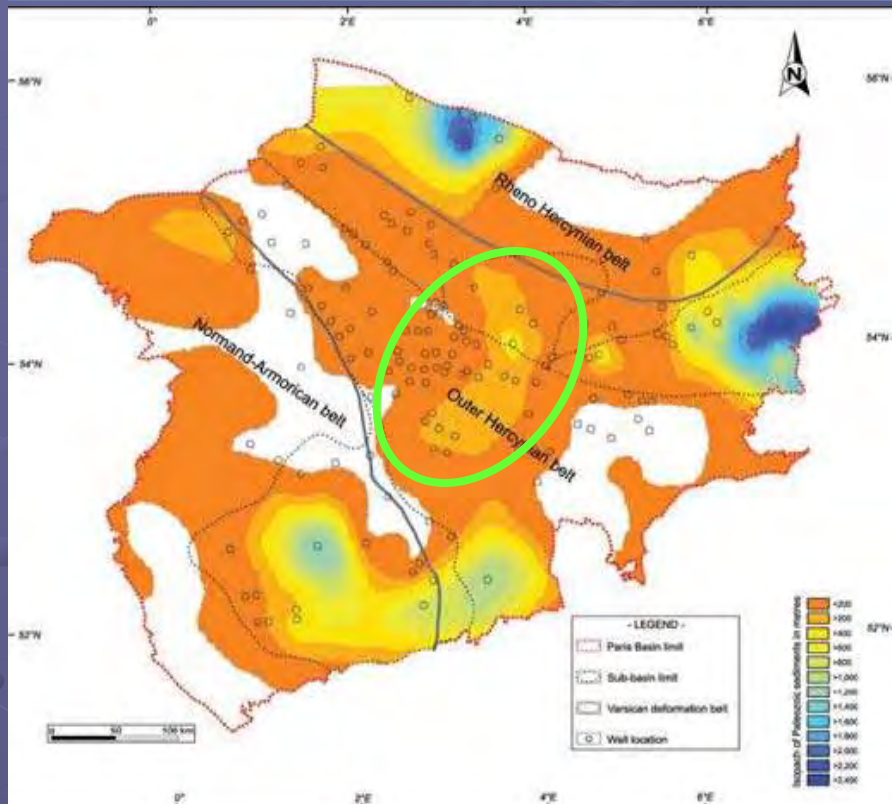
- Lutetian source rock extensional limit
- Wells
- Iso-Tmax (T3) values range (T3)

Scale: 0 to 50 km

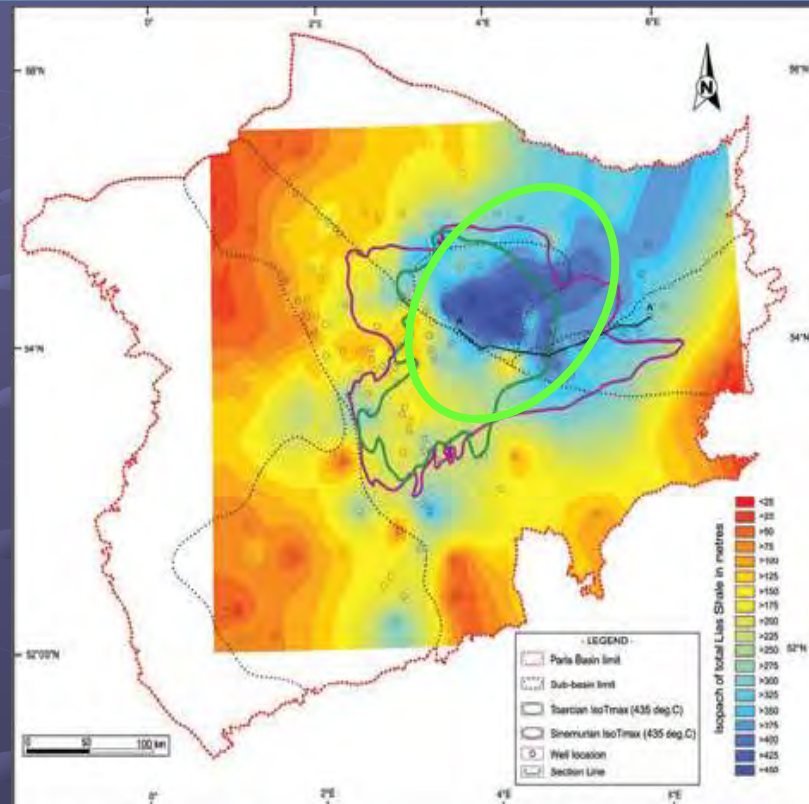
Geochemical data confirms oil generation model and play fairway

Paris Basin Lias Isopach and Thermal Maturity

Isopach map of Lias shale



Thermal maturity appears optimum across Concorde acreage



Exploration Focus

- Thick Lias deposition
- Optimum thermal maturity
- Rich TOC

Paris Basin – Areal Extent of “Kitchen”

SOURCE ROCKS / AREAS (Km2) Oil Prod / AREAS (Km2) Oil Expulsion

Late Toarcian	9500	Immature
Early Toarcian “Schistes Cartons”	11000	1700
Lotharingian	19000	6000
Sinemurian Hettangian	22000	9000

-Source: Poulet, M & Espitalie, J
“Hydrocarbon Migration in the Paris Basin”
Editions Technip 1987, Paris pg 145.

Paris Basin Oil Expulsion Model

<u>SOURCE ROCKS / Petrol. Pot. (MM T/Km2) /</u>		<u>Petrol Generated /</u>	<u>Petrol Expelled</u>
		Billions Barrels	Billions Barrels
Late Toarcian	3-5	209.0 - 342.0	---
Early Toarcian "Schistes Cartons"	3-5	242.0 – 396.0	37.4 – 61.2
Lotharingian	2-3	277.4 – 418.0	96.0 – 132.0
Sinemurian Hettangian	2-3	321.2 – 484.0	131.4 – 198.0
TOTALS		1,049.6 – 1,640.0	264.8 – 391.2

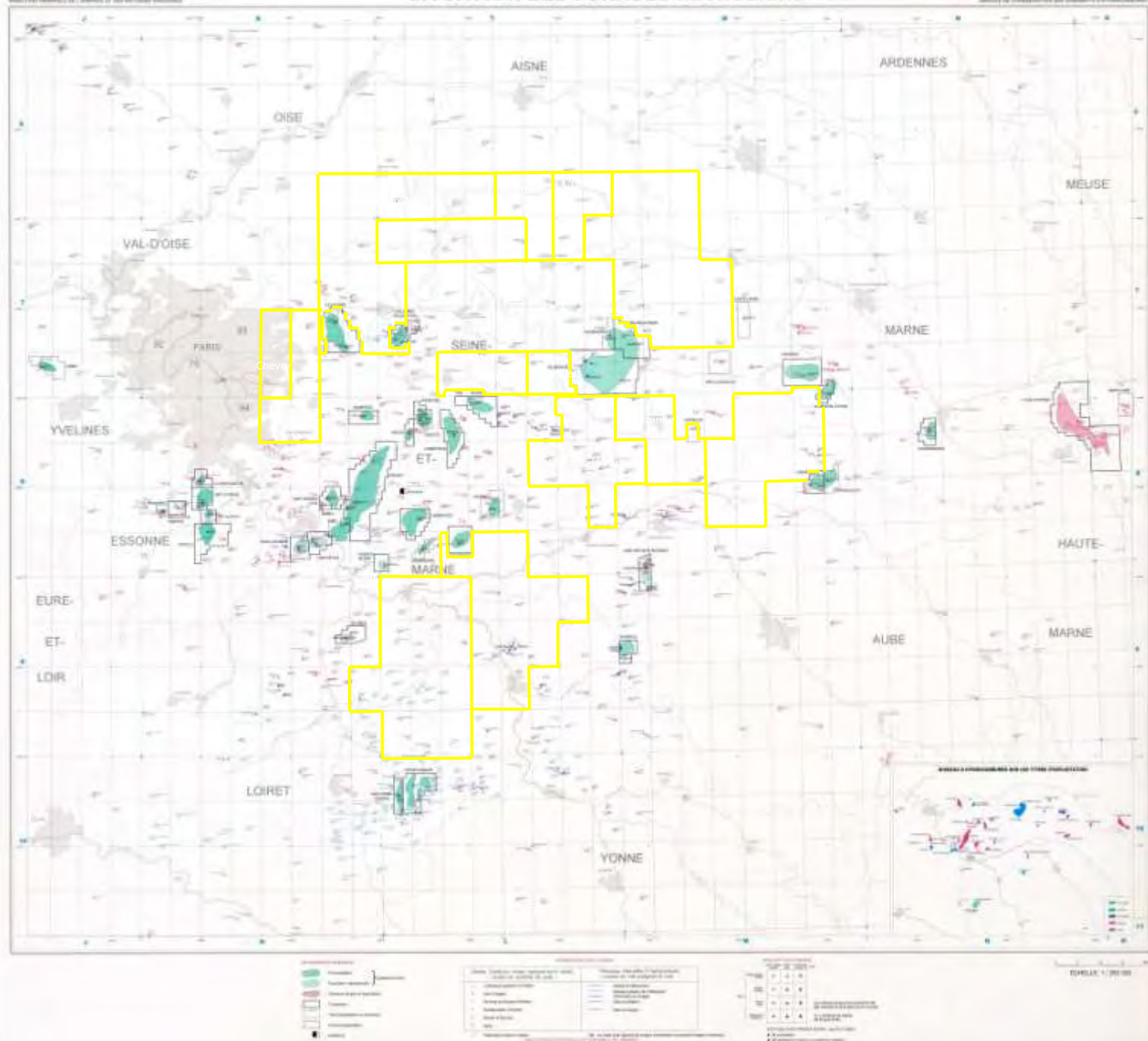
-Source: Poulet, M & Espitalie, J
 "Hydrocarbon Migration in the Paris Basin"
Editions Technip 1987, Paris pg 131 - 171.

Paris Basin Liassic Shows & Flows

WELL	DATE	TOARCIAN - DOMERIAN	PLIENSCHACHEN	HETTANGIAN	OIL, GAS SHOWS, FRACT	OIL KICK/FLOW
R A P - MONTMIRAIL - 1	1958			●	● ●	
PETROREP - CROIX-SUR OUDOU - 1	1958			●	●	
MOBIL - LATILLY - 1	1958			●	●	
MOBIL - VILLEMOYENNE - 1	1958			●	● ●	
RAP - NANGIS - 1	1959		●			●
PETROREP - MONTLEVÉE - 1	1959	●			●	
PETROREP - COULOMMES BELOU - 1	1959	●			●	
RAP - ESSISES - 1	1960			●		●
PETROREP - COULOMMES CS42	1969	●		●	●	
SNEA (P) - CONNANTRE - 1	1981			●		● ●
Esso REP - LEUDON - 1	1981		●			●
Esso REP - MELARCHEZ-1	1983	●	●			●
SNEA (P) - HERME - 1	1985	●	●		●	●
Esso REP - CHAMPOTRAN - 1	1985		●		● ●	
Esso REP - MALNOUE - 1	1985	●	●	●	● ●	
TOTAL - CERNEUX 102 (S17)	1986	●				●
SNEA (P) - SOMMESOUS - 1	1987			●	●	
Esso REP - SAINT LAZARE - 1	1987	●	●		●	
Esso REP - MALNOUE - 7D	1988		●			●
PETROREP - LAILLY - 1	1989		●	●		● ●
Esso REP - GLAIRET - 1	1990	●	●		●	
LUNDIN - CENSE ORMAT - 1	2003		●			● ●

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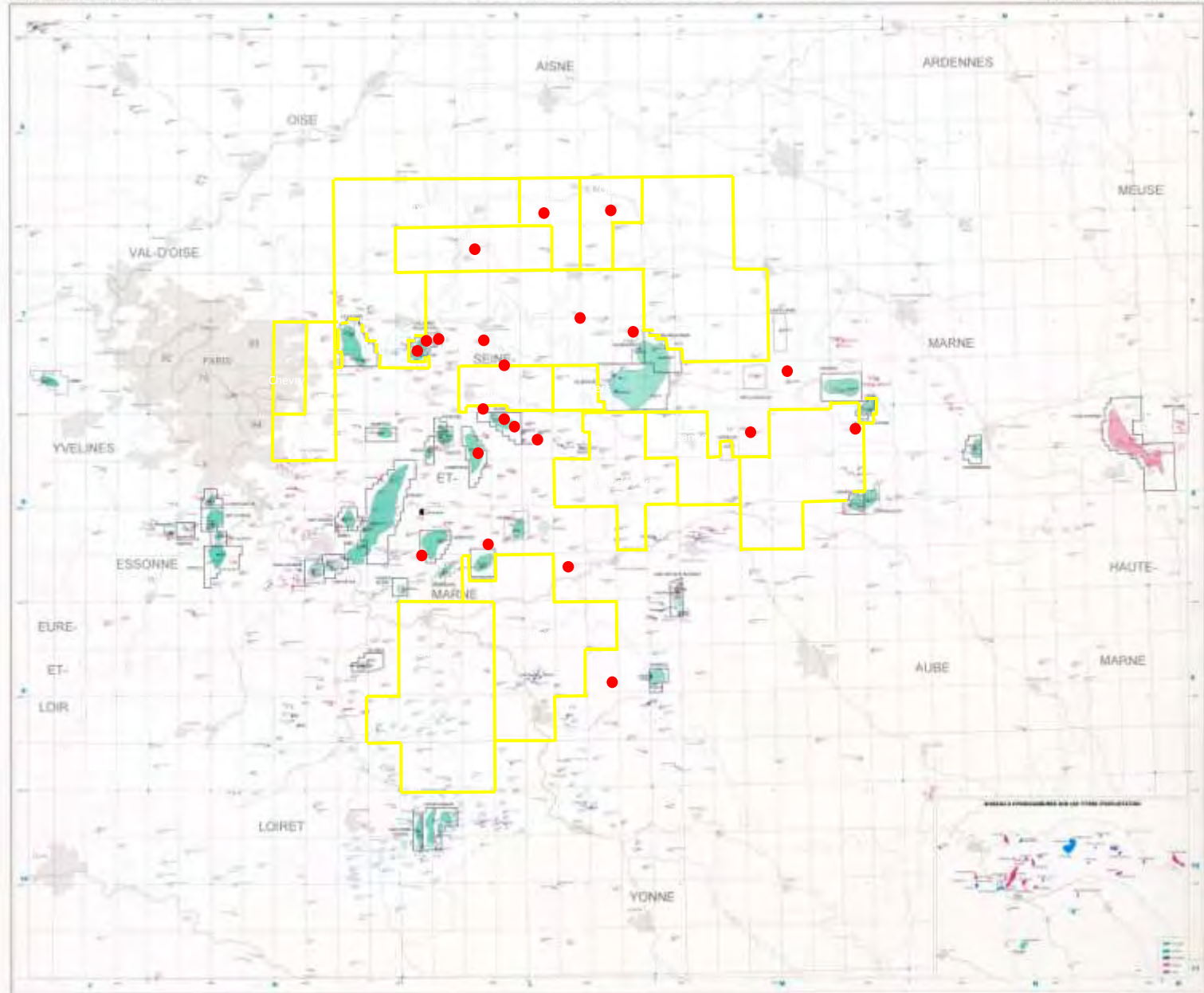


BASSIN DE PARIS

SITUATION DES FORAGES PÉTROLIERS

Ministère de l'Énergie, des Pétroles et de l'Industrie, Direction Générale de l'Énergie
Ministère de l'Énergie et des Pétroles, Direction Générale de l'Énergie

Ministère de l'Énergie, des Pétroles et de l'Industrie, Direction Générale de l'Énergie
Ministère de l'Énergie et des Pétroles, Direction Générale de l'Énergie



Symbole	Description
[Red dot]	Forage pétrolier
[Green line]	Faille
[Blue line]	Faille normale
[Red line]	Faille inverse
[Black line]	Faille transformante
[Green area]	Zone d'accumulation de pétrole
[Blue area]	Zone d'accumulation de gaz
[Red area]	Zone d'accumulation de sel
[Black area]	Zone d'accumulation de sable
[Green area]	Zone d'accumulation de lignite
[Blue area]	Zone d'accumulation de charbon
[Red area]	Zone d'accumulation de tourbe
[Black area]	Zone d'accumulation de schiste



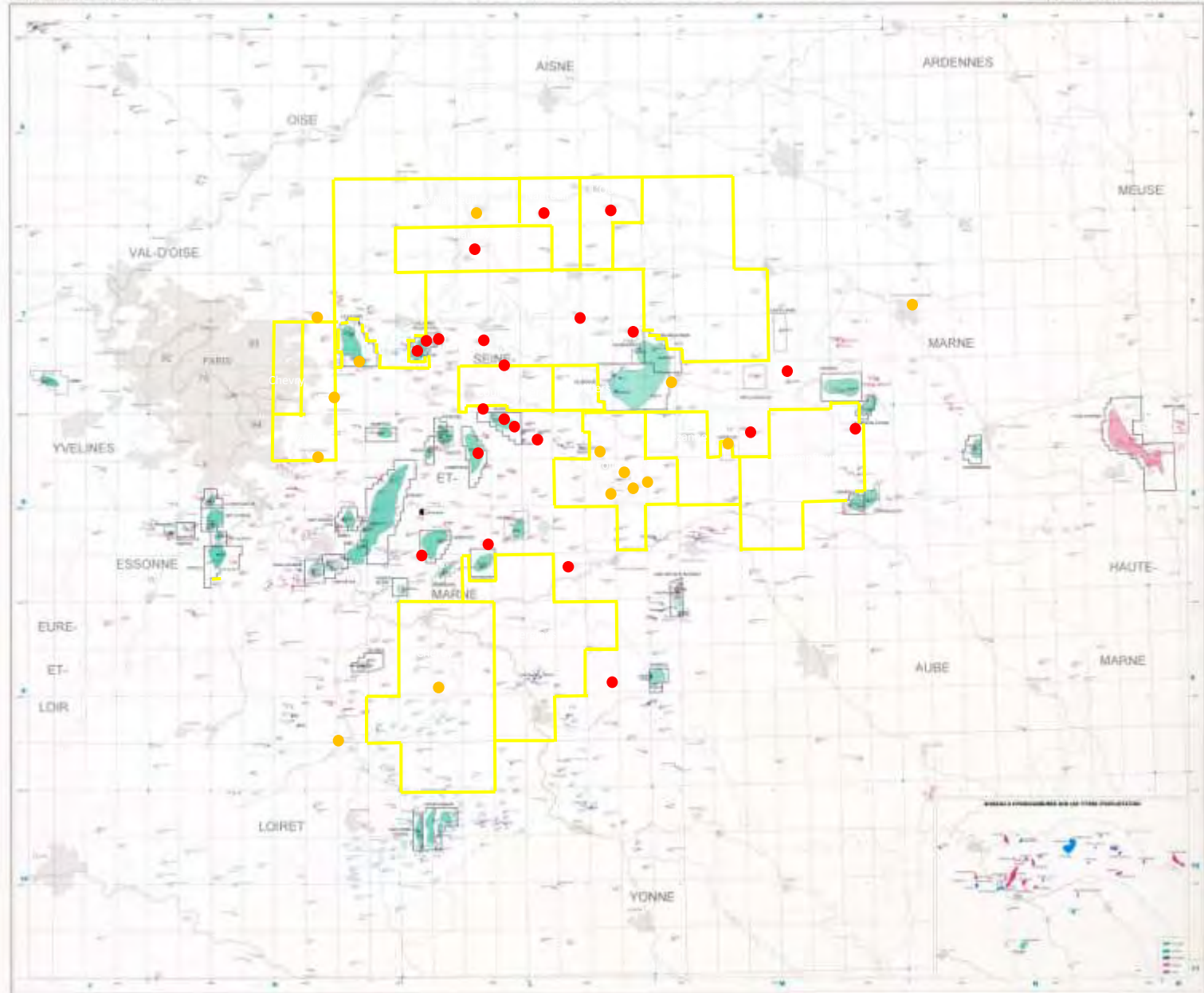
Échelle: 1:250 000

BASSIN DE PARIS

SITUATION DES FORAGES PÉTROLIERS

Document de la Direction des Ressources et de la Production de la Direction Générale de l'Énergie et du Climat
Document de la Direction des Ressources et de la Production de la Direction Générale de l'Énergie et du Climat

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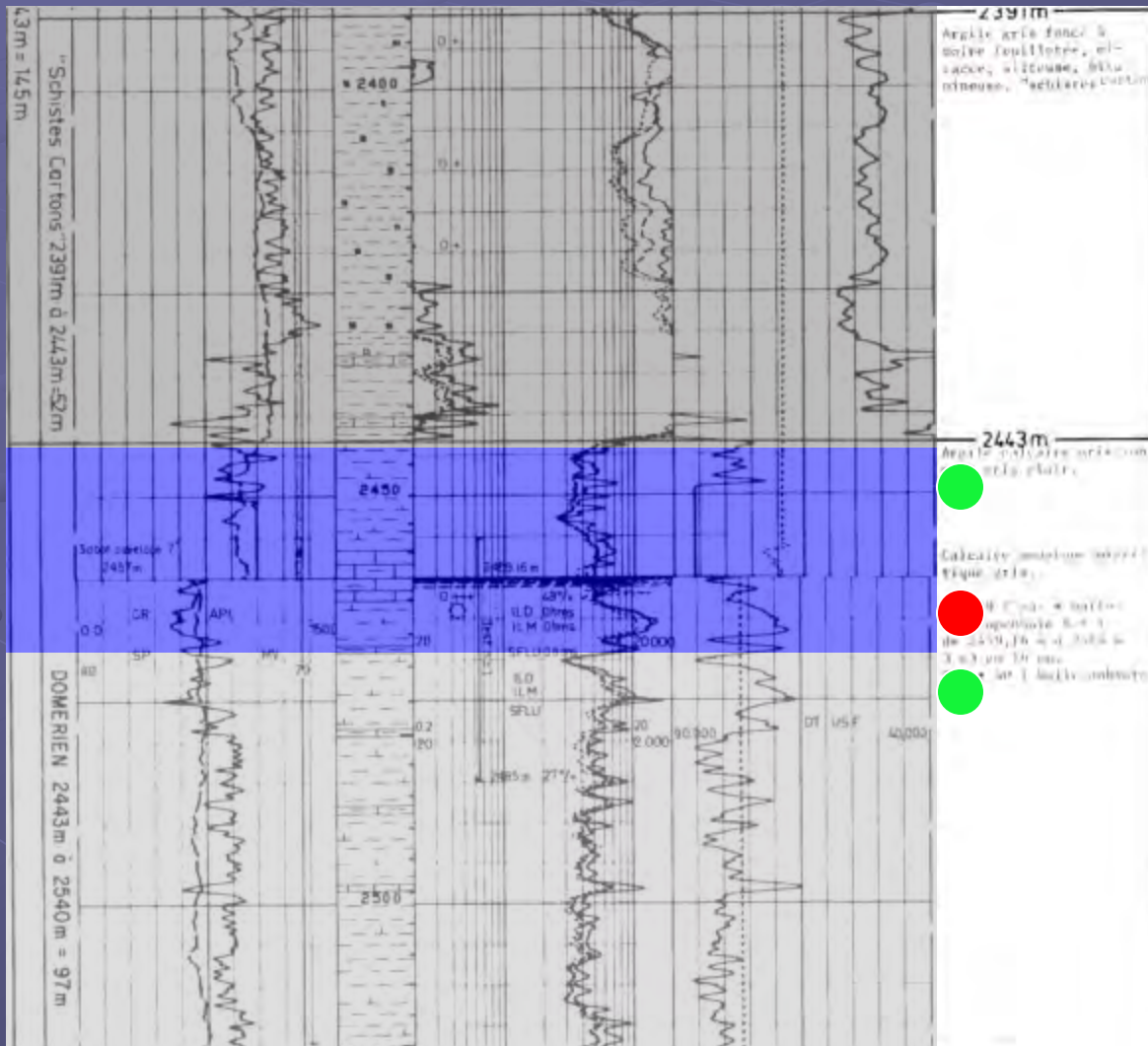
Code	Description	Code	Description
1	Forage pétrolier	10	Forage gaz
2	Forage pétrolier	11	Forage gaz
3	Forage pétrolier	12	Forage gaz
4	Forage pétrolier	13	Forage gaz
5	Forage pétrolier	14	Forage gaz
6	Forage pétrolier	15	Forage gaz
7	Forage pétrolier	16	Forage gaz
8	Forage pétrolier	17	Forage gaz
9	Forage pétrolier	18	Forage gaz



Échelle: 1:250 000

Paris Basin Melarchez Example

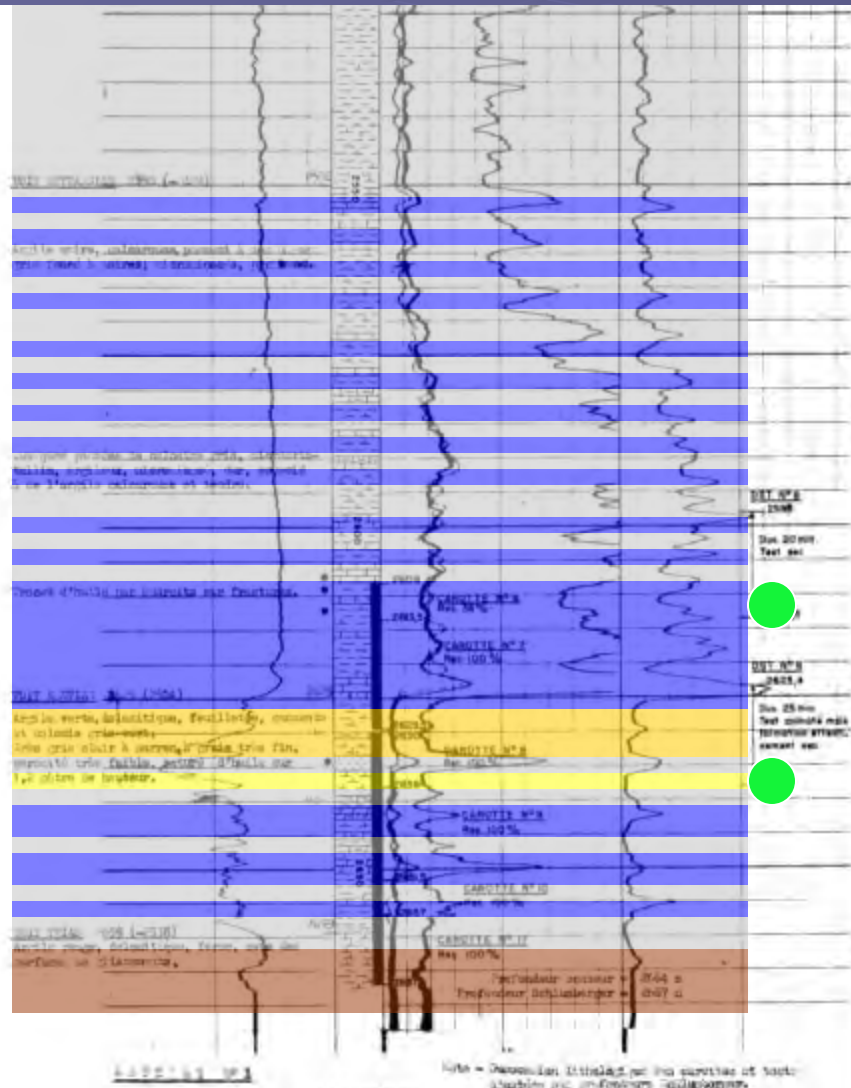
Melarchez #1Bis Banc du Roc



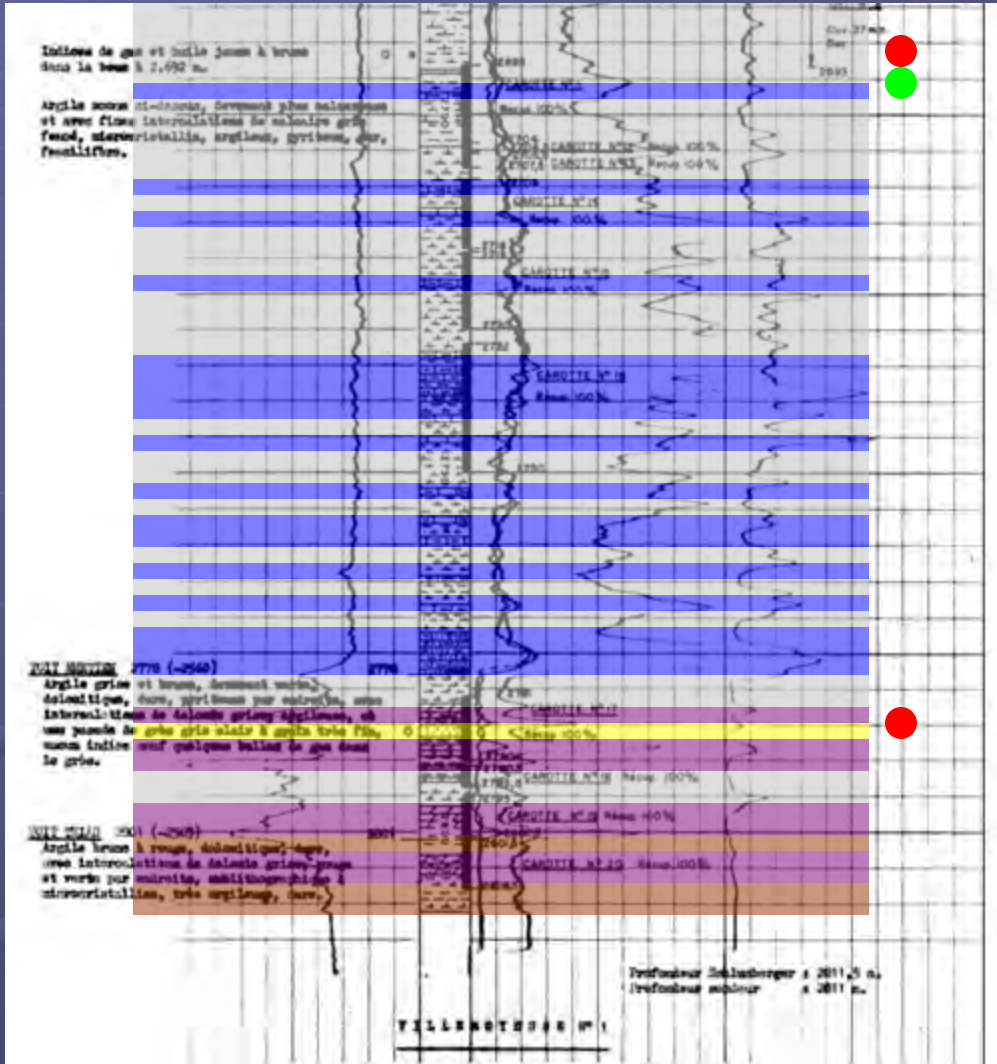
Paris Basin Latilly Example

Latilly #1

Hettangian “Shale”



Hettangian “Shale”



TOARCEN 1153 m

(125 m) 1153 m

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Paris Basin XRD and Petrography

b



High Quartz content:

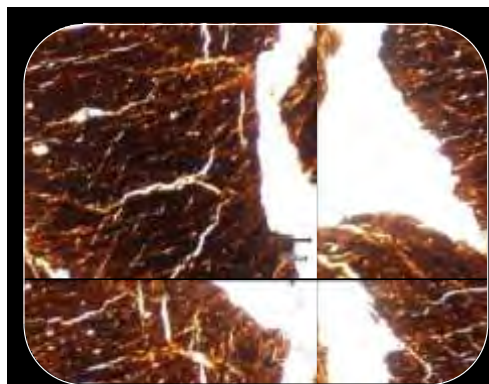
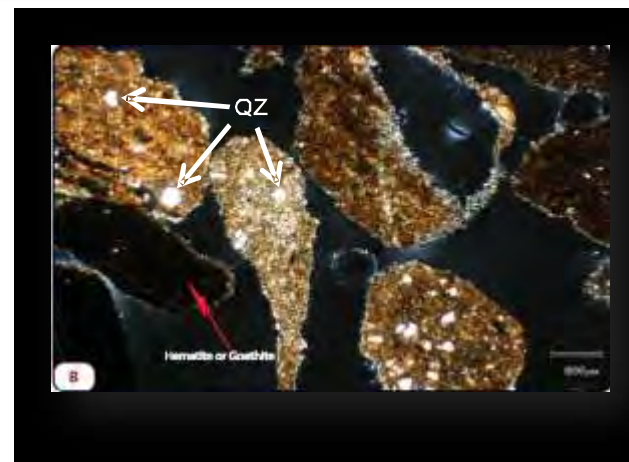
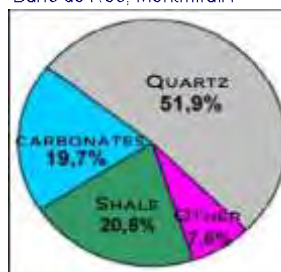
- XRD analysis
- Thin Sections



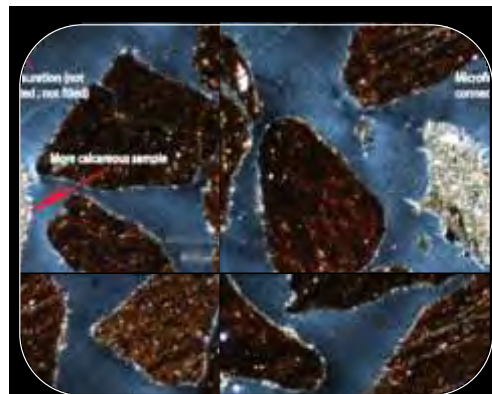
Microfracturation

:

Banc de Roc, Montmirail 1



Essises 1



Mélarchez 1

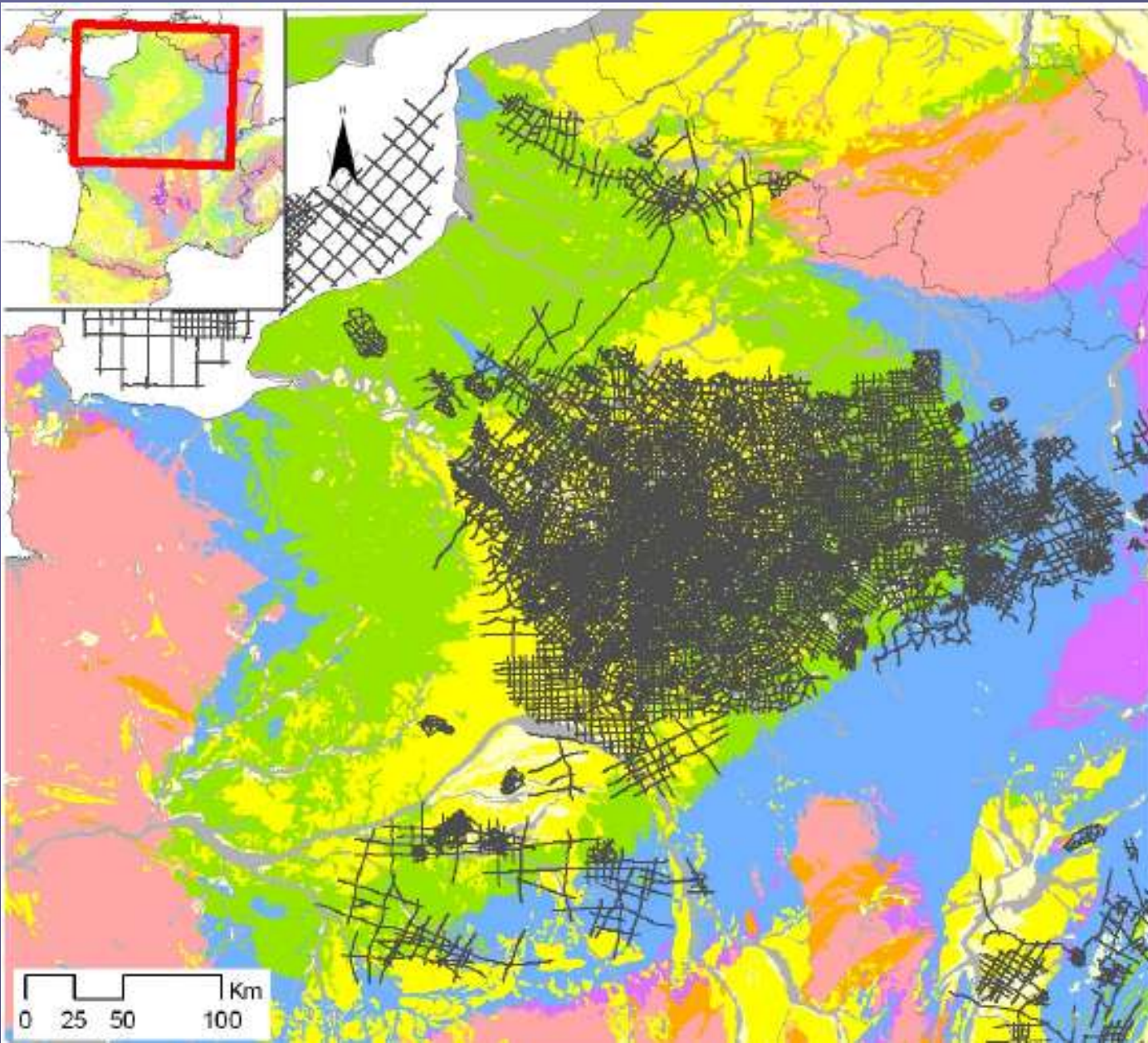


Pré Verson 1



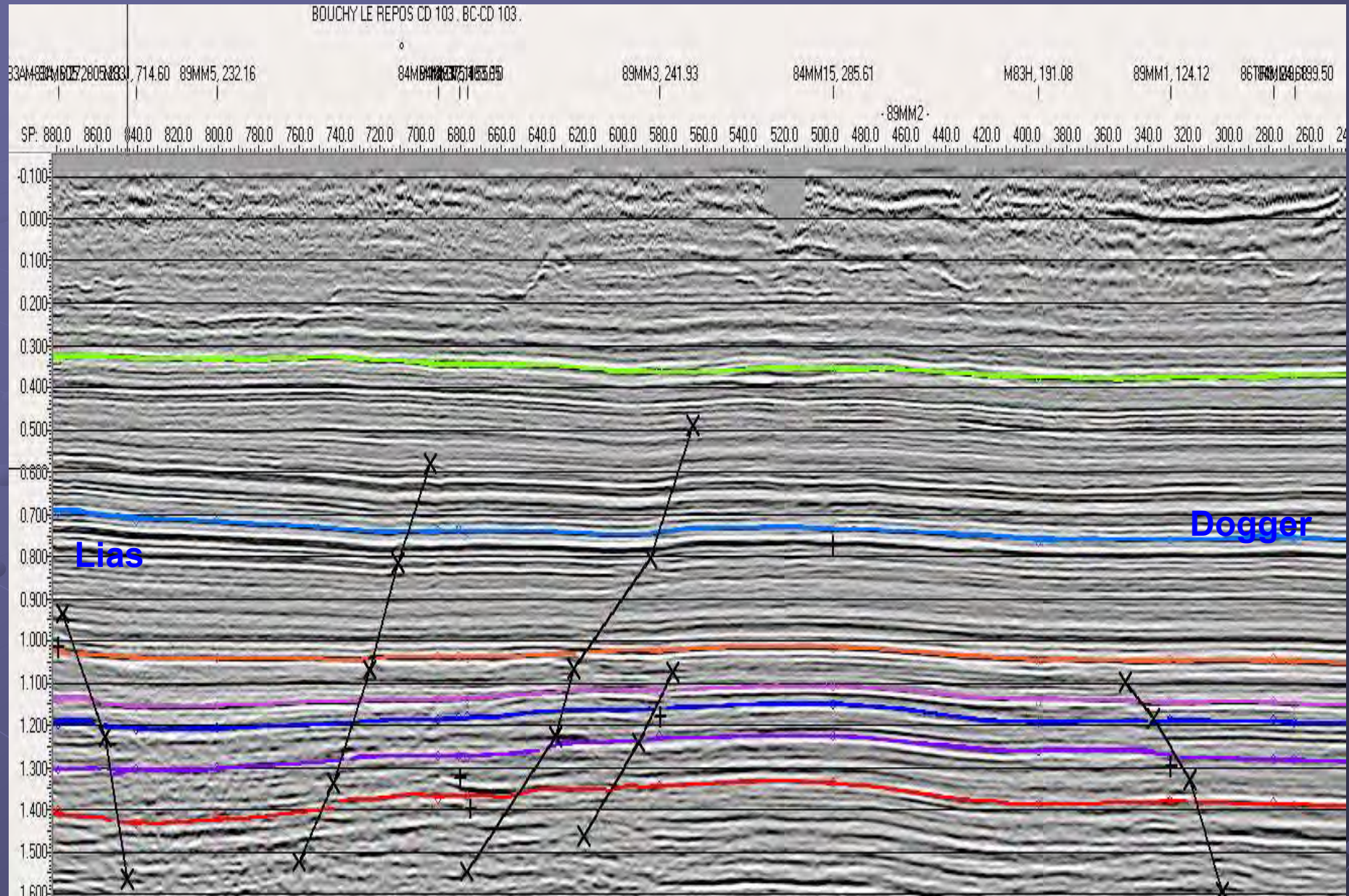
Overpressure indications: Oil & Gas Kicks, 1 Blow Out

Paris Basin Seismic Coverage

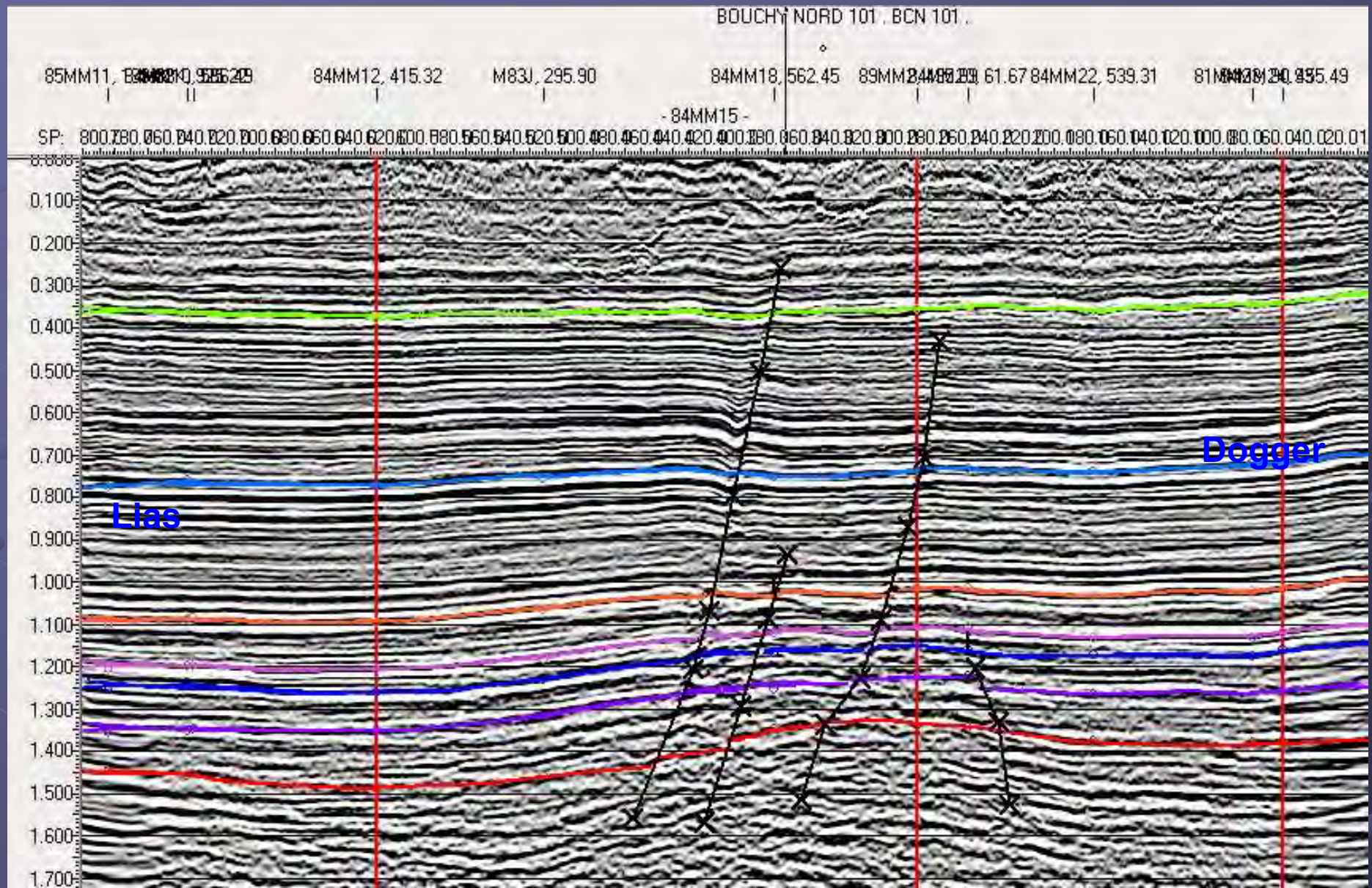


- Seismic profiles acquired in the Paris Basin since 1970

Paris Basin Seismic Example



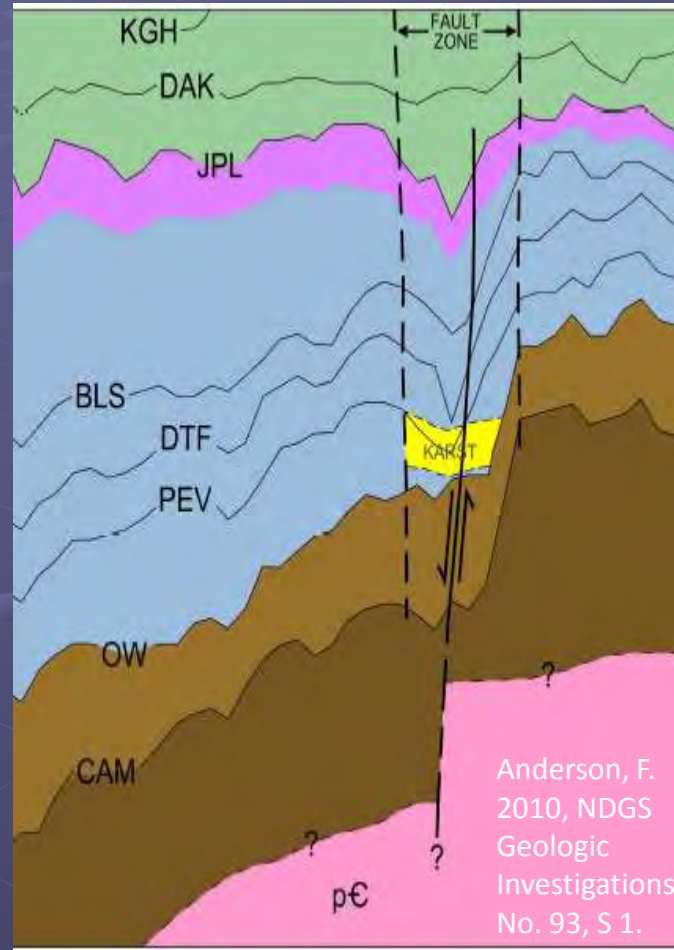
Paris Basin Seismic Example



Seismic Example Bakken Analog



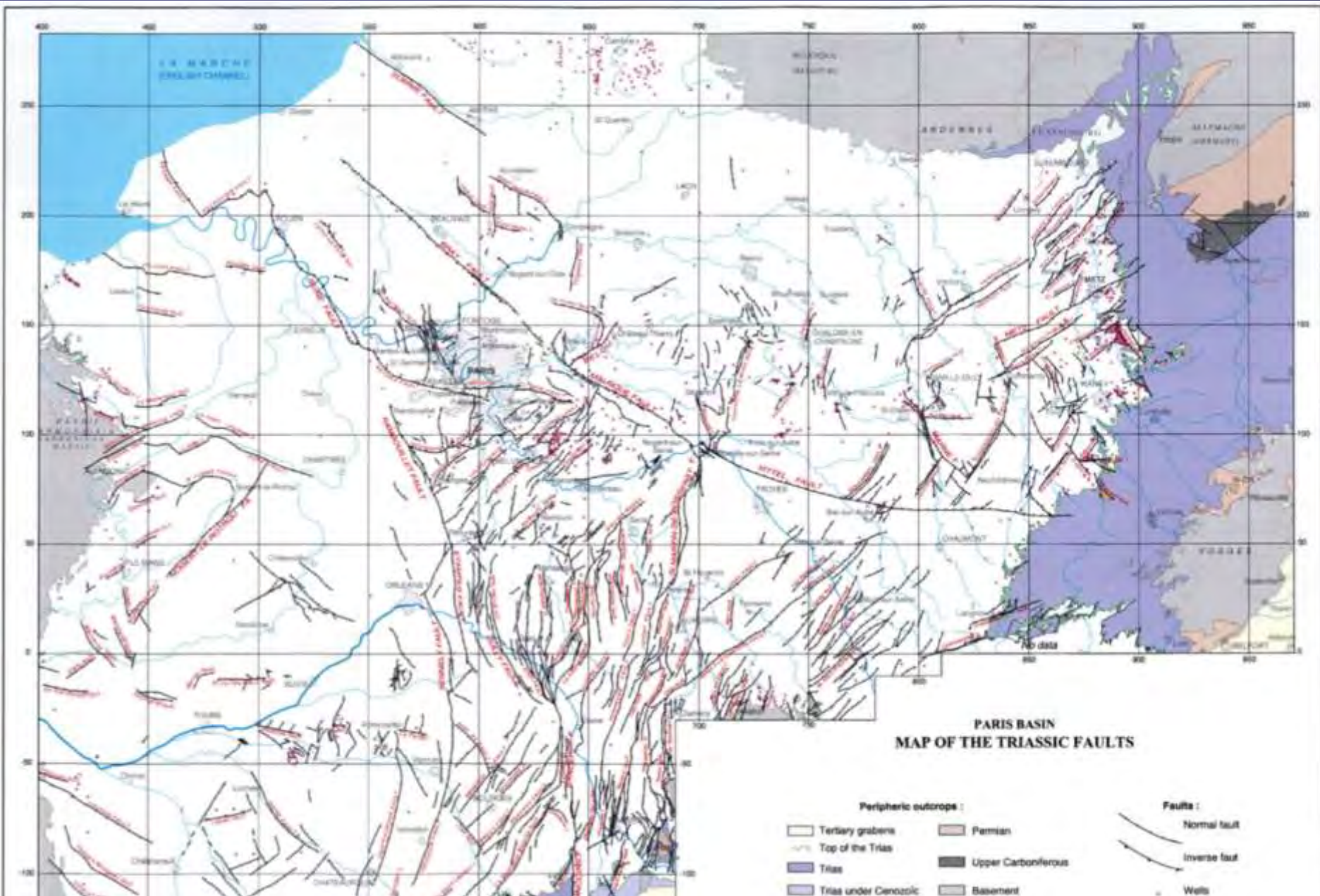
Bakken 2D Seismic Line showing subtle faulting



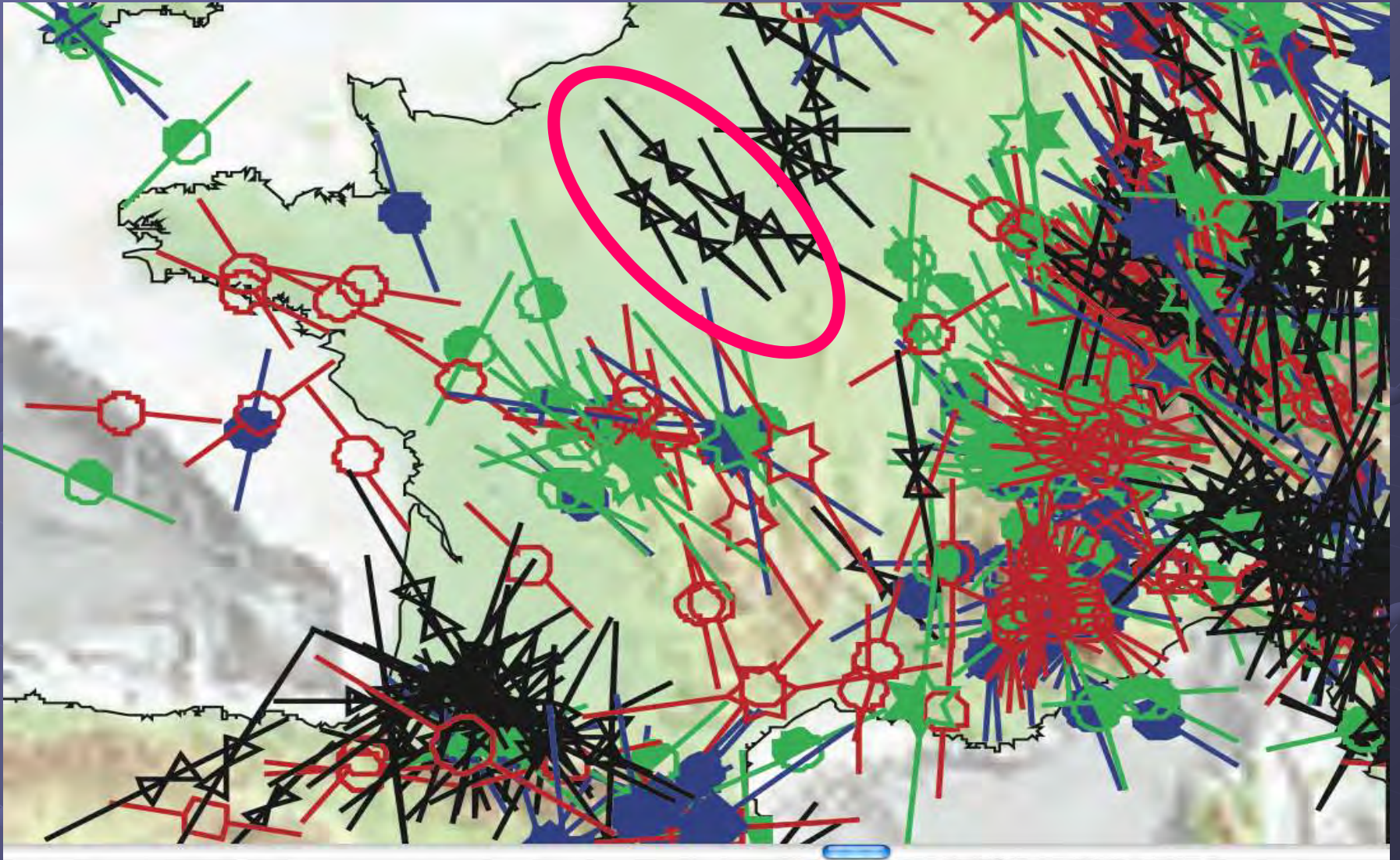
Bakken Interpretation

In the Bakken Play, basement block movements can migrate upward and be observed on the surface as lineaments. This character is also observed in the Paris Basin.

Paris Basin Fault Map at Triassic



Paris Basin – Sh max

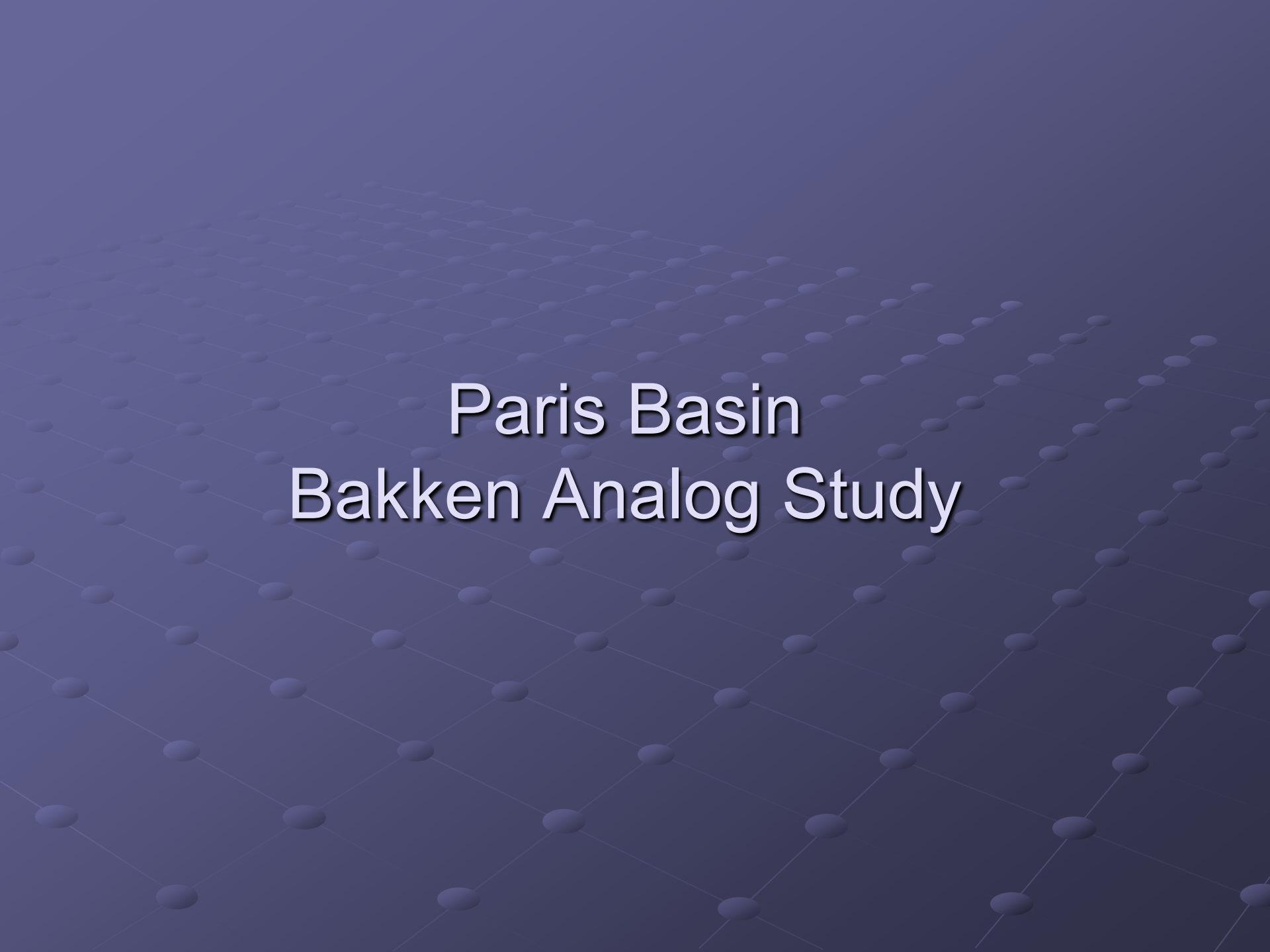


Borehole breakout analysis indicates stress anisotropy – Sh max NW-SE

Critical Success Factors

Oil Shale Plays

- ★ OOIP Need significant resource
- ★ Thickness Frac Containment- Zonal Sep & Resource
- ★ Natural Fractures Storage & Transport
- ★ Maturation Mature Kerogen - Active generation?
- ★ Catagenesis Kerogen maturation
- ★ Stress – Anisotropy Orientation(s) of frac vs wellbore
- ★ Brittleness High Young's and Low Poisson's ... please?
- ★ Mineralogy Clays, Type-Volume, Pyrite, Calcite fill?
- ★ Permeability Pore Throats vs Micro Fractures
- ★ Oil Gravity – Viscosity Fluid flow-recovery efficiency

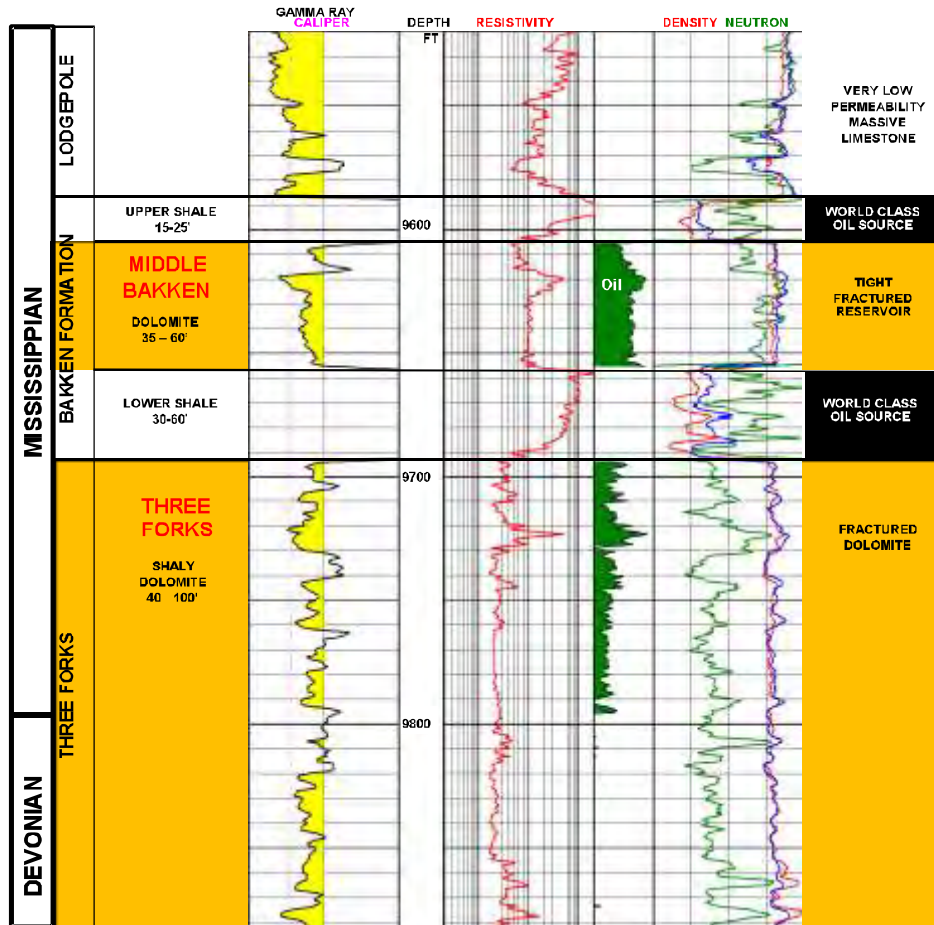
The background is a dark blue gradient with a subtle, repeating pattern of light blue dots connected by thin lines, creating a grid-like effect that recedes into the distance.

Paris Basin Bakken Analog Study

Bakken Analog – Similar Stratigraphic Configuration

Horizontal Bakken/Three Forks

Type Log

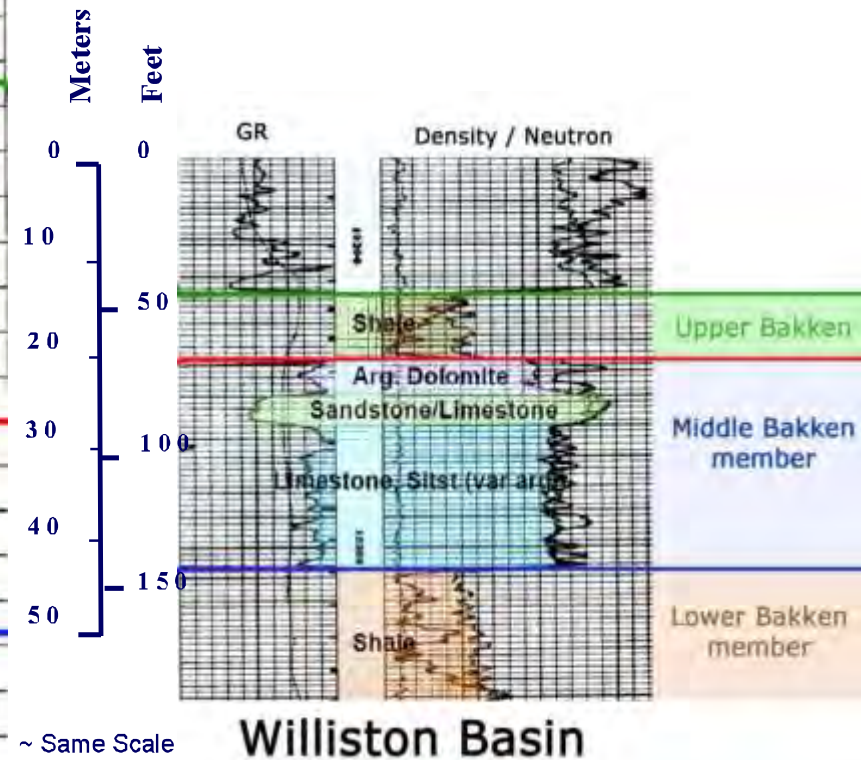
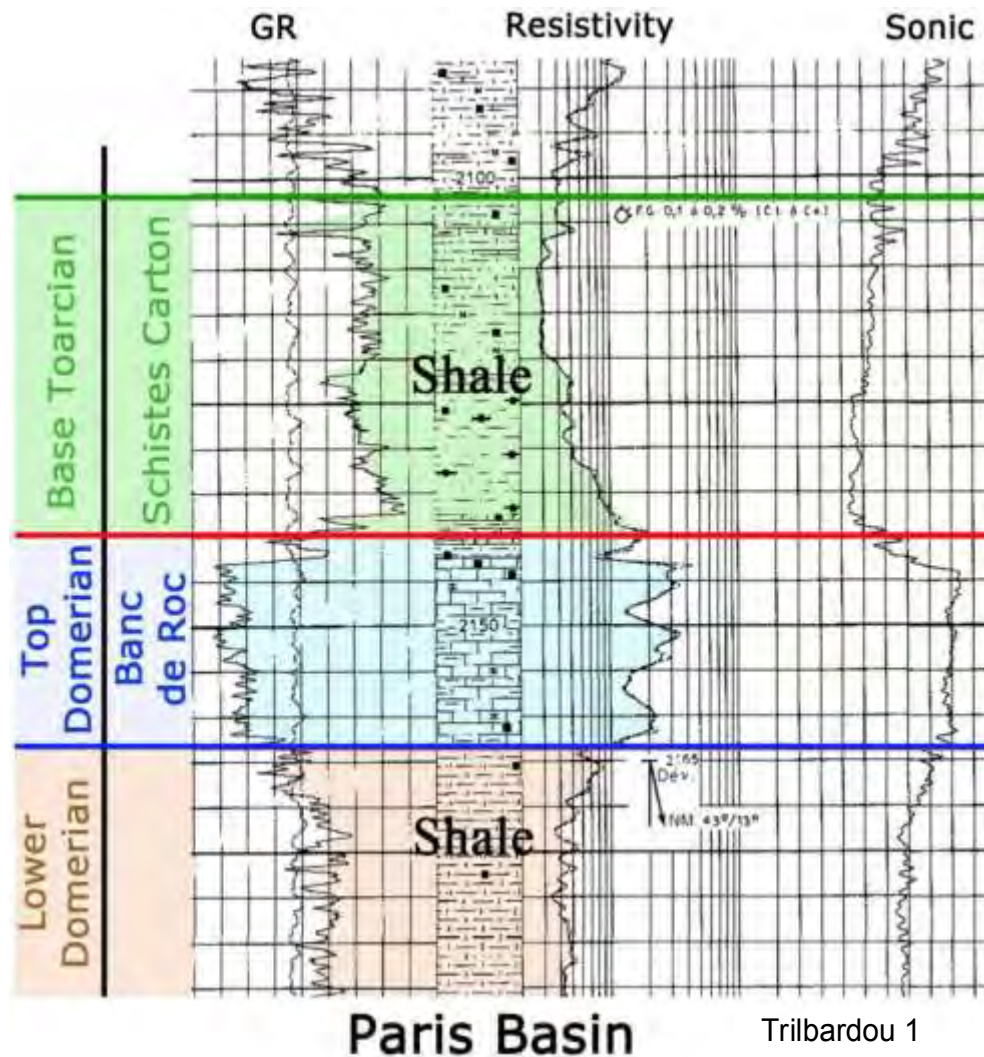


● World Class Oil Shales
Sourced Both Bakken and
Three Forks Formations

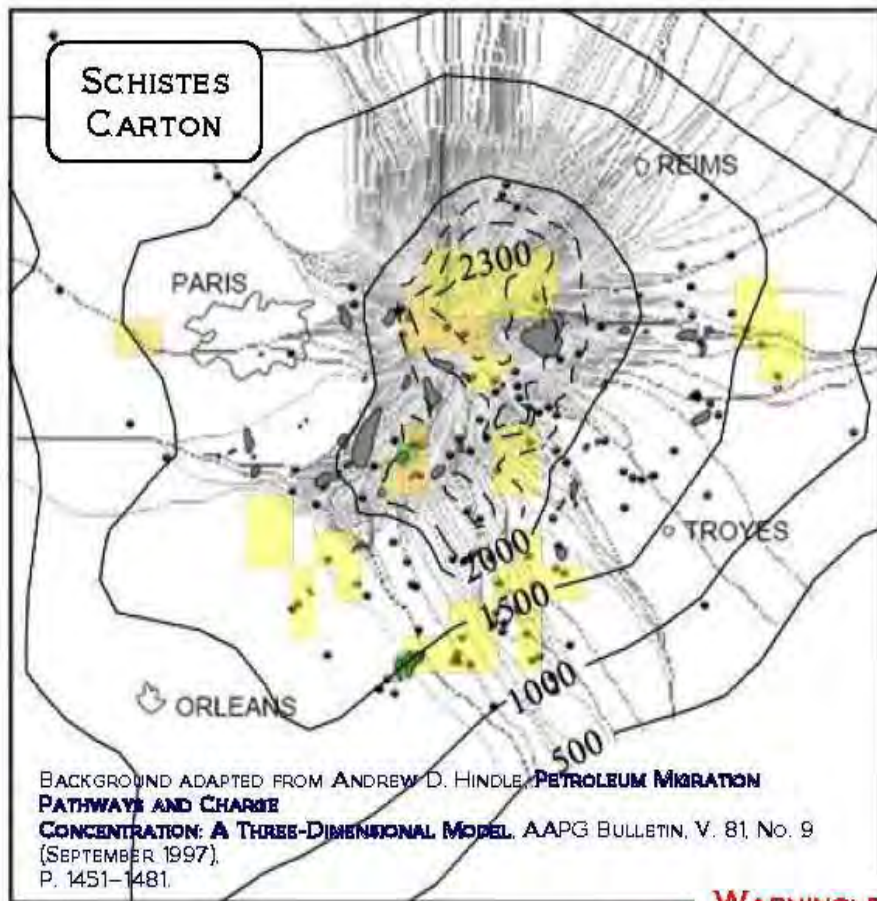
● Bakken Dolomite
Average Oil-in-Place
7.0MM Barrels/Section

● Three Forks Estimated
Average Oil-in-Place
6.5MM Barrels/Section

Paris Basin – Bakken Comparison



Paris Basin-Bakken Burial Depth Comparison



WARNING: DIFFERENT SCALE!

Oil Field

Oil Show

0 50 km

CONTOUR INTERVAL: 500 M

Oil Discovery

0 100 km

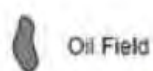
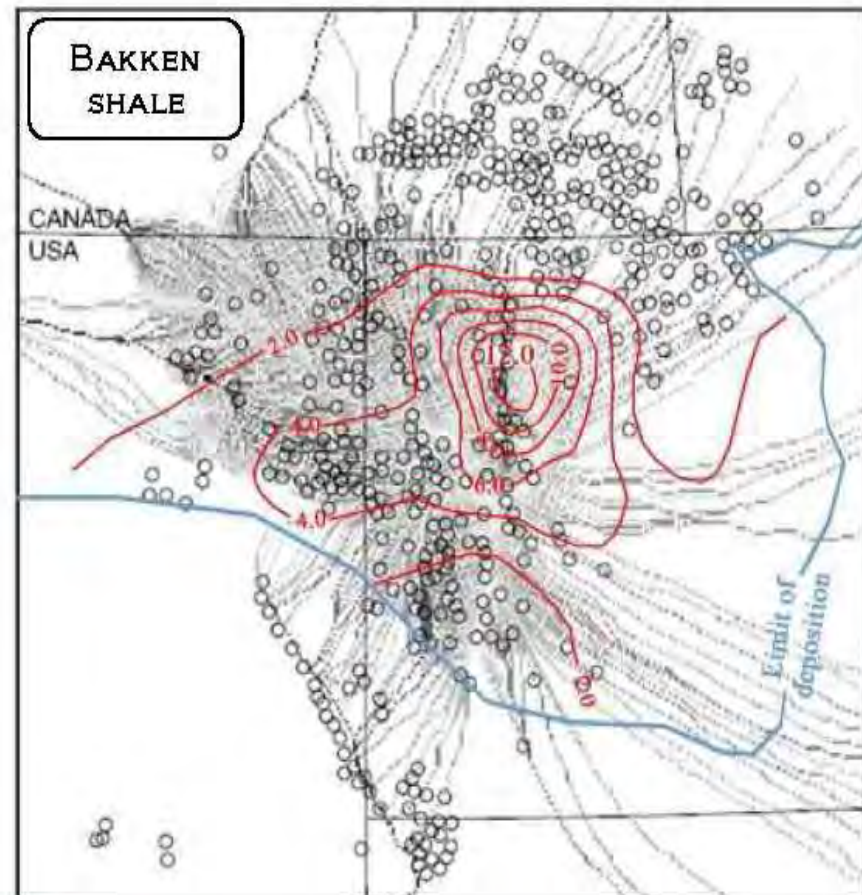
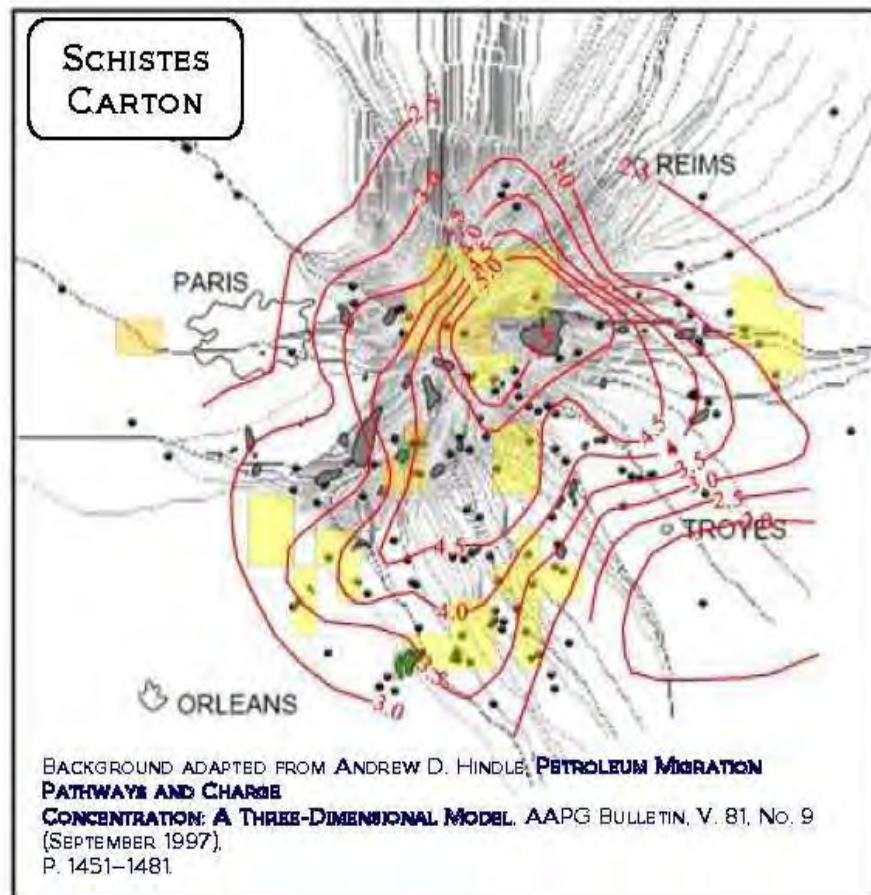
FROM G. BESSEREAU, **PARIS BASIN REGIONAL REPORT**, INSTITUT FRANÇAIS DU PÉTROLE, AUGUST 1996

FROM FRED F. MEISSNER AND RICHARD B. BANKS, **COMPUTER SIMULATION OF HYDROCARBON GENERATION, MIGRATION, AND ACCUMULATION UNDER HYDRODYNAMIC CONDITIONS**, ORAL PRESENTATION AT AAPG INTERNATIONAL CONFERENCE AND EXHIBITION, OCTOBER 15-18, 2000, BALI, INDONESIA

PARIS BASIN

WILLISTON BASIN

Paris Basin – Bakken TOC Comparison



Oil Field



Oil Show

0 50 km

TOC IN WEIGHT %

○ Oil Discovery

0 100 km

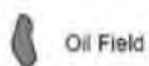
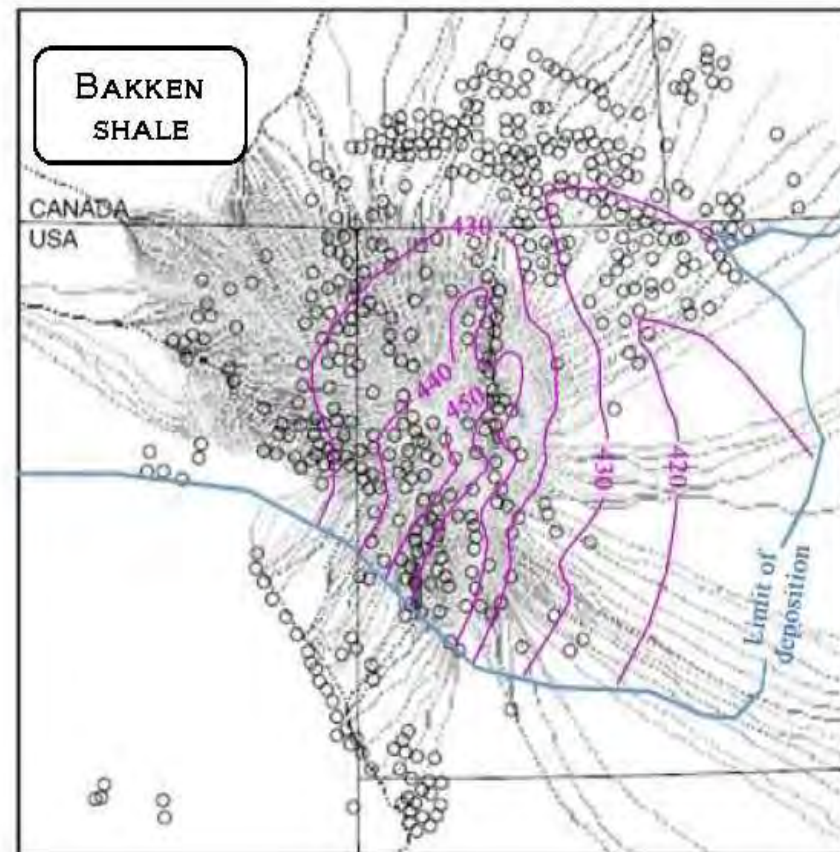
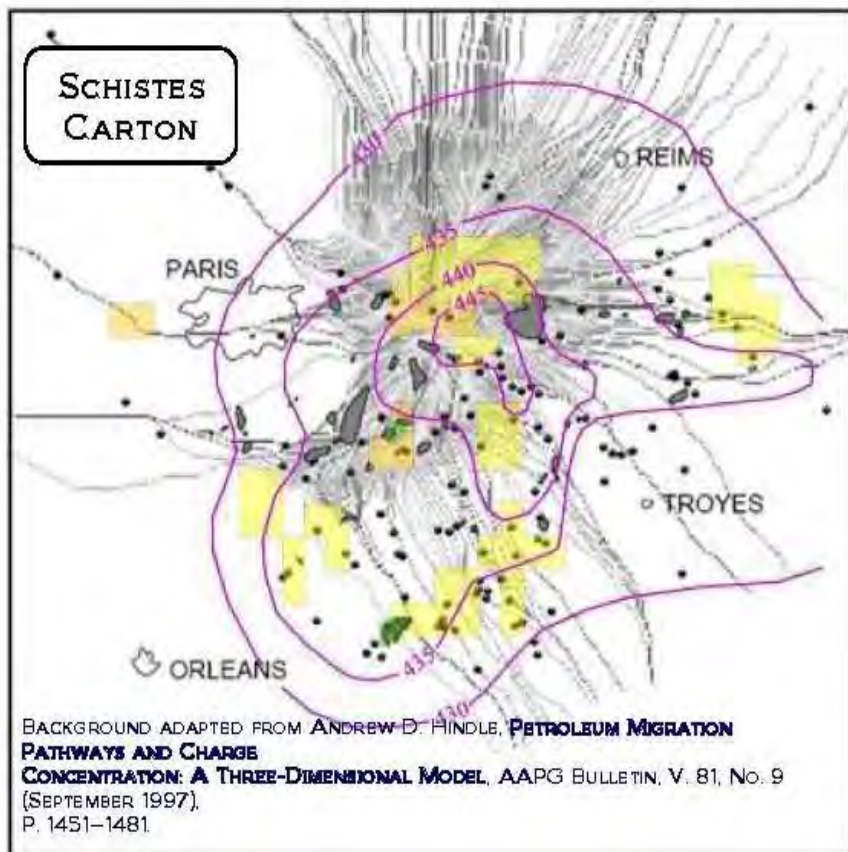
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PARIS BASIN

WILLISTON BASIN

Paris Basin – Bakken Tmax Comparison



Oil Field



Oil Show

0 50 km

TMAX IN °C



Oil Discovery

0 100 km

FROM G. BESSEREAU, **PARIS BASIN REGIONAL REPORT**, INSTITUT FRANÇAIS DU PÉTROLE, AUGUST 1996

FROM FRED F. MEISSNER AND RICHARD B. BANKS, **COMPUTER SIMULATION OF HYDROCARBON GENERATION, MIGRATION, AND ACCUMULATION UNDER HYDRODYNAMIC CONDITIONS**, ORAL PRESENTATION AT AAPG INTERNATIONAL CONFERENCE AND EXHIBITION, OCTOBER 15-18, 2000, BALI, INDONESIA

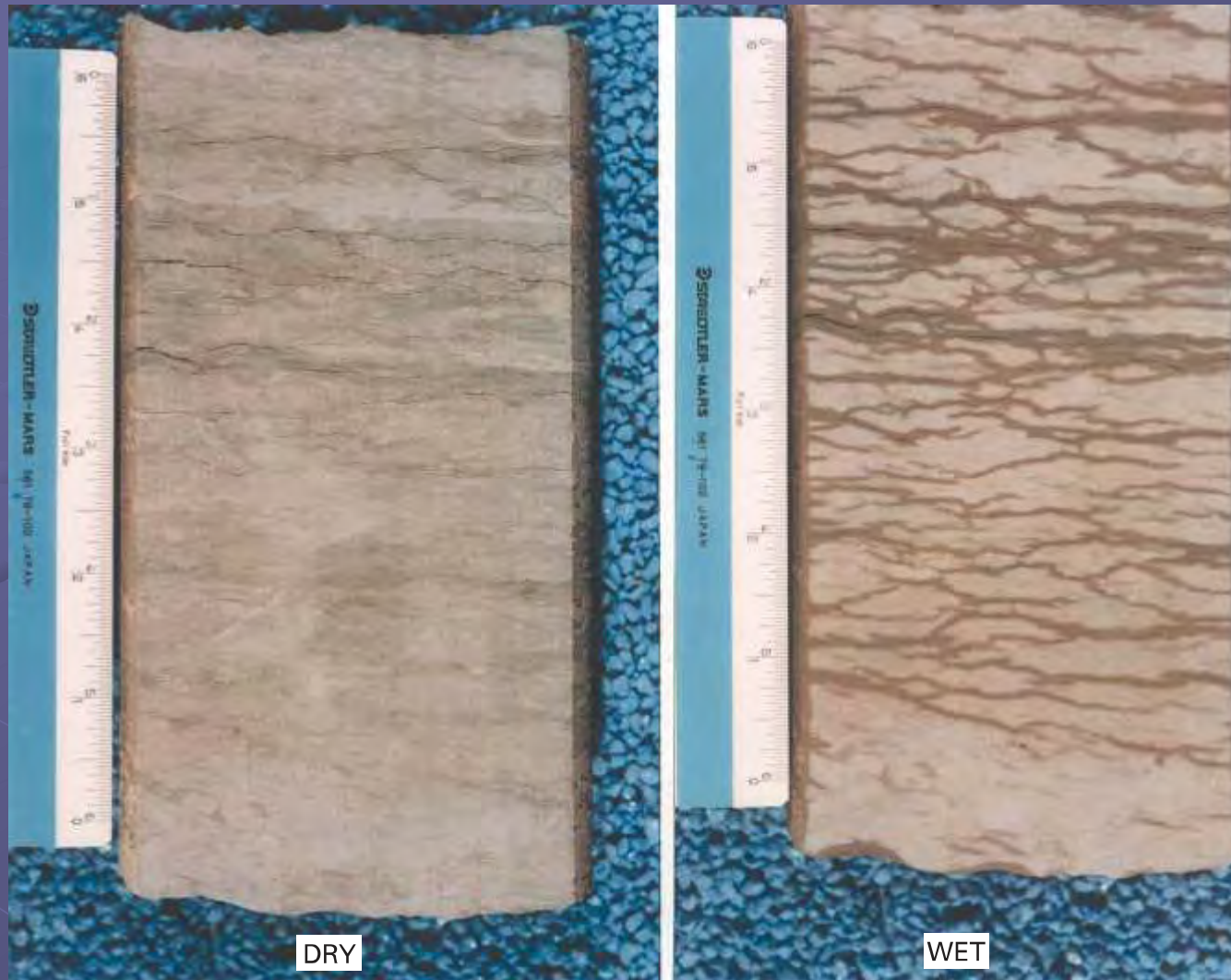
PARIS BASIN

WILLISTON BASIN

TMAX CORRESPONDS TO THE TEMPERATURE OF MAXIMUM OF HYDROCARBON FORMATION DURING THE PROGRAMMED PYROLYSIS RUN.

Bakken Analog – Oil Production from Source Rocks

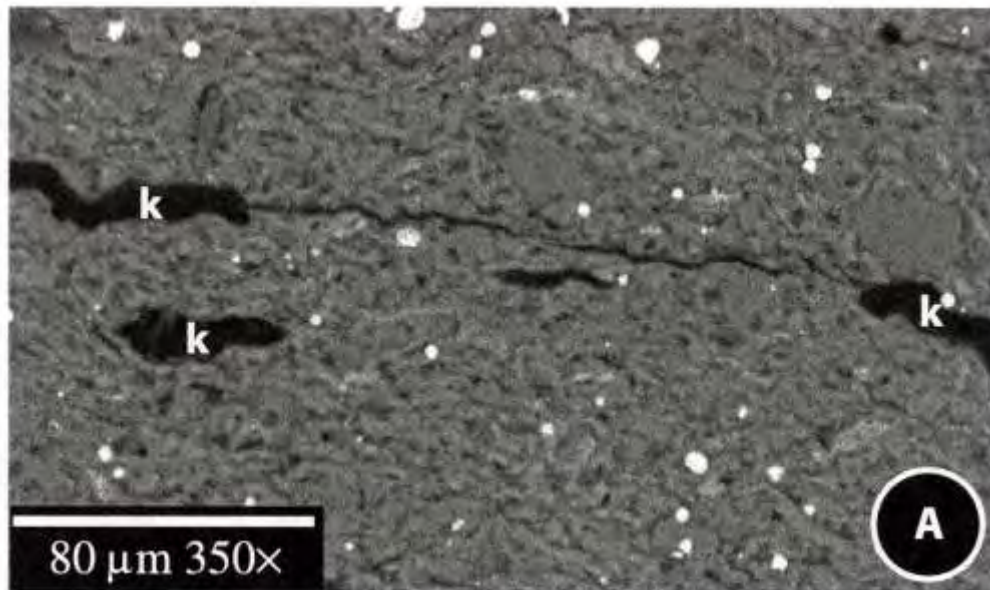
Micro-fractures in Bakken Formation



Why Maturity Matters

- **Catagenesis in mature source rocks**
- **Large strength anisotropy**
- **Super-lithostatic pore pressure**
- **Horizontal micro-fracture propagation**

Slabbed sandstone displaying reticulated horizontal fracture network in dry and wet condition. Sample from Bakken Middle Member (Shell 33-23-154 USA, Sec 23 T146N R104W).



- Catagenesis in shale source rocks creates its own porosity and permeability.

- Horizontal micro-fractures coalesce and connect with vertical macro-fractures.

- This mechanism accounts for migration of oil from impermeable source rocks

Backscatter electron images of polished finely laminated black shale samples showing micro-fractures that have originated within or along the edges of kerogen particles. (Example from Dunkirk Shale – Devonian, New York. After Lash and Engelder 2005)



A



B



C



D

Whole core example of horizontal oil-filled micro-fractures in mechanical communication with vertical macro-fracture in over-pressured source rock (Tuscaloosa Marine Shale).

(A - 12,325.0-12,325.3') 20% enlargement black light photo of intact vertical fracture and smaller horizontal associated micro-fractures with gold oil fluorescence.

(B- 12,329.5') Gold oil fluorescence along along horizontal fractures

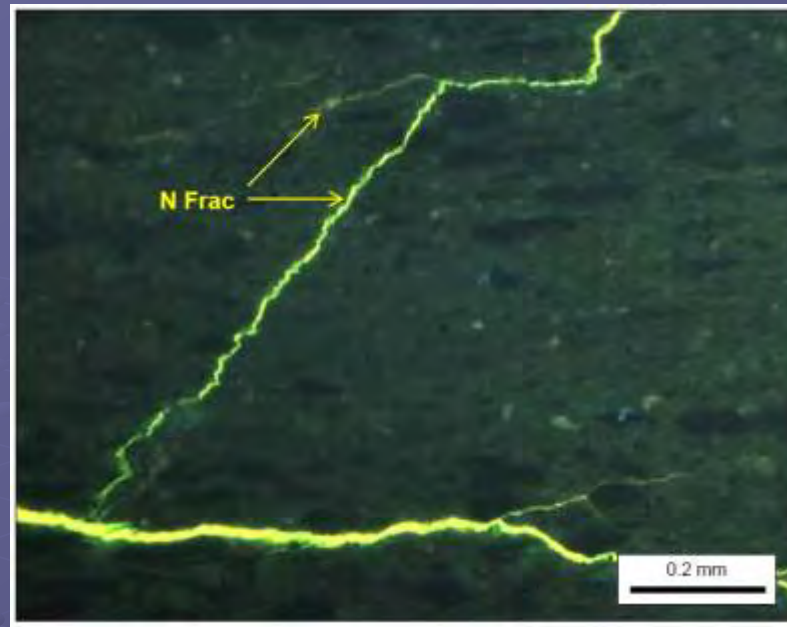
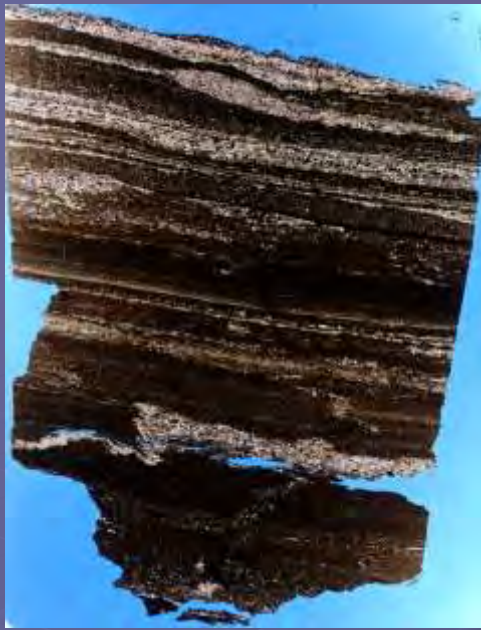
(C- 12,329.5') 4" long core section with horizontal fractures and oil fluorescence.

(D- 12,330') 2" long section of highly pyritized core.

(Red arrow = oil fluorescence White arrow = mineral fluorescence)

From Unocal #1 I.J. Lambert 53-6

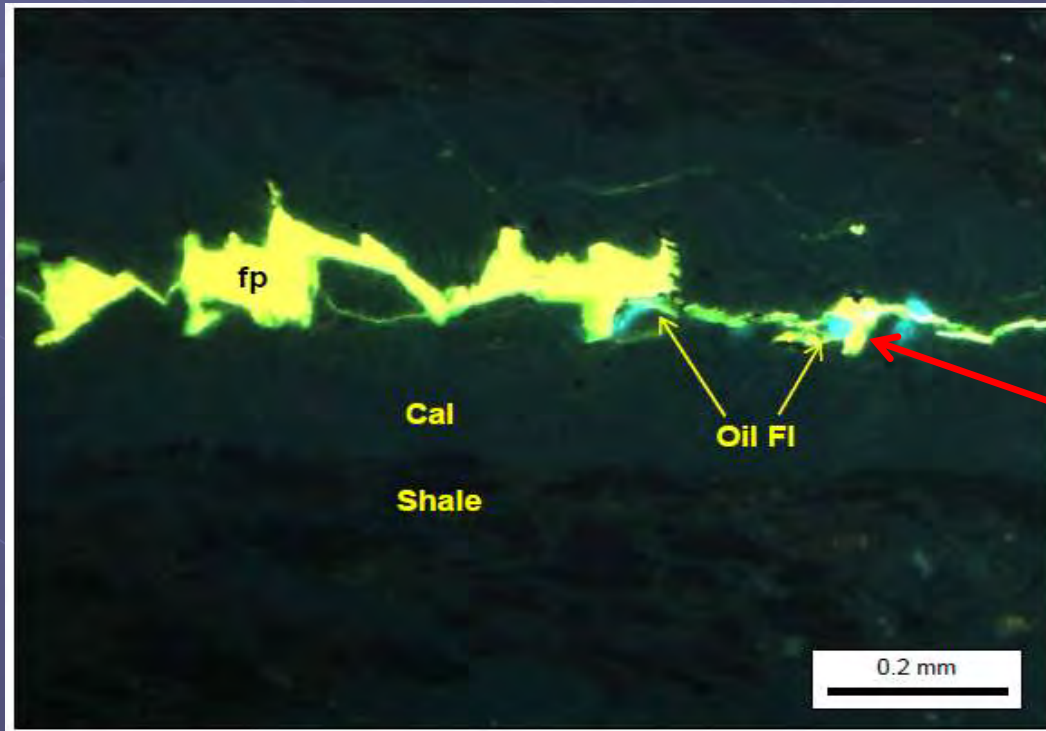
****NOTE**** Core was photographed 5 days after retrieval and intensity of fluorescence is diminished due to evaporation. Red arrows highlight oil fluorescence.



*Niobrara thin section
photomicrograph example*

Catagenesis has
propagated horizontal
micro-fractures

Pathway and storage for
hydrocarbon charge



Thin Sections of
Niobrara showing
presence of fine
grain clastic
laminations, natural
fractures and oil
saturation

Bakken Analogy Summary

Rock Types - Deposition

Paris Basin Liassic

Bakken

- | | | |
|----------------------------|--|--|
| ➤ TOC | ➤ 0-12% (avg 5%) | ➤ 0-40% (avg 10%) |
| ➤ Tmax | ➤ 445 deg C | ➤ 445 deg C |
| ➤ Source Rock | ➤ Type II | ➤ Type II |
| ➤ Organic Matter | ➤ Marine Plankton + Anaerobic Bacteria | ➤ Marine Plankton + Anaerobic Bacteria |
| ➤ Depositional Environment | ➤ Marine and Oxygen Restricted | ➤ Marine and Oxygen Restricted |
| ➤ Adjacent Water Prod Zone | ➤ None | ➤ Lodgepole |

Bakken Analogy Summary

Reservoir Characteristics

Paris Basin Liassic

Bakken

- | | | |
|-------------------|-------------------------|-----------------------|
| ➤ Brittle Layer | ➤ Banc de Roc Lime | ➤ Mid Bakken Dolomite |
| ➤ Quartz Content | ➤ 26 – 58 % | ➤ 20 – 68 % |
| ➤ Net Meters (ft) | ➤ 1 – 40 m (4 - 130 ft) | ➤ 2 – 20 m (7-66 ft) |
| ➤ Porosity % | ➤ 9 - 12% (avg 10%) | ➤ 3 – 10% (avg 5%) |
| ➤ Permeability | ➤ Up to 5.0 md | ➤ 0.05 – 0.5 md |
| ➤ Oil Gravity | ➤ 34 - 38 deg API | ➤ 42 deg API |

Paris Basin France

Premier Unconventional Resource Opportunity?

- Thick, rich, and mature oil source rock
- Structurally simple basin
- Stratigraphy offers reservoir and mechanical lithofacies favorable for exploitation
- Active hydrocarbon generation and slight over-pressure
- Moderate drilling depths
- Existing petroleum production infrastructure
- Proximal premium market

Paris Basin

- Possible multi-billion barrel oil resource
- 3rd largest modern economy in Europe
- Small vocal environmental faction has successfully urged government to ban hydraulic fracture stimulation
- Government slowly “studying” stimulation to develop policy
- Oil resource exploration on hold
- What's next???????