

COLOMBIA ROUND 2021

Seismic Tour along the Putumayo Basin

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M.Sc. In Geology
Master in Business Administration
Exploration Geophysics Specialist
International Oil Management Specialist

- Geologist (UIS)
- Master of Science in Geology (Colorado School of Mines)
- Master of Business Administration (MBA) (Universidad de Los Andes)
- Specialist in Exploration Geophysics (Colorado School of Mines)
- Specialist in International Management of Hydrocarbons (U. de Los Andes)

Experience

- Ecopetrol (17 years)
- Hocol (2 years)
- Pacific Rubiales (8 years)
- Mansarovar Energy (4 years)

Volunteering

- AAPG Latin America: Visiting Geologist
- ACGGP Colombia Visiting Geologist
- Bull Scout Colombia 2020 - Present
- ACGGP President 2010-2011
- Guest speaker in topics such as: Seismic Interpretation, Sequence Stratigraphy, Advanced Petroleum Geology in many Faculties of Latin America
- Author of the Lecture Series “Tour Sísmico por varias cuencas sedimentarias de Latinoamérica” (Seismic Tour by many sedimentary basins of Latin America)




Disclaimer

- Only public data was used with academic purposes
- The interpretations are regional and author responsibility
- Confidential data and reports that modify these interpretations could exist
- The main intention is making general statements and not exact locations of prospects



Putumayo Basin Overview



Stratigraphic Column & Regional Xsections



Bouguer Anomaly Map



Petroleum Systems Map & Event Chart



North Zone



From Rio Pescado to Unicornio



Central Zone



From Condor to Alea



Eastern Zone

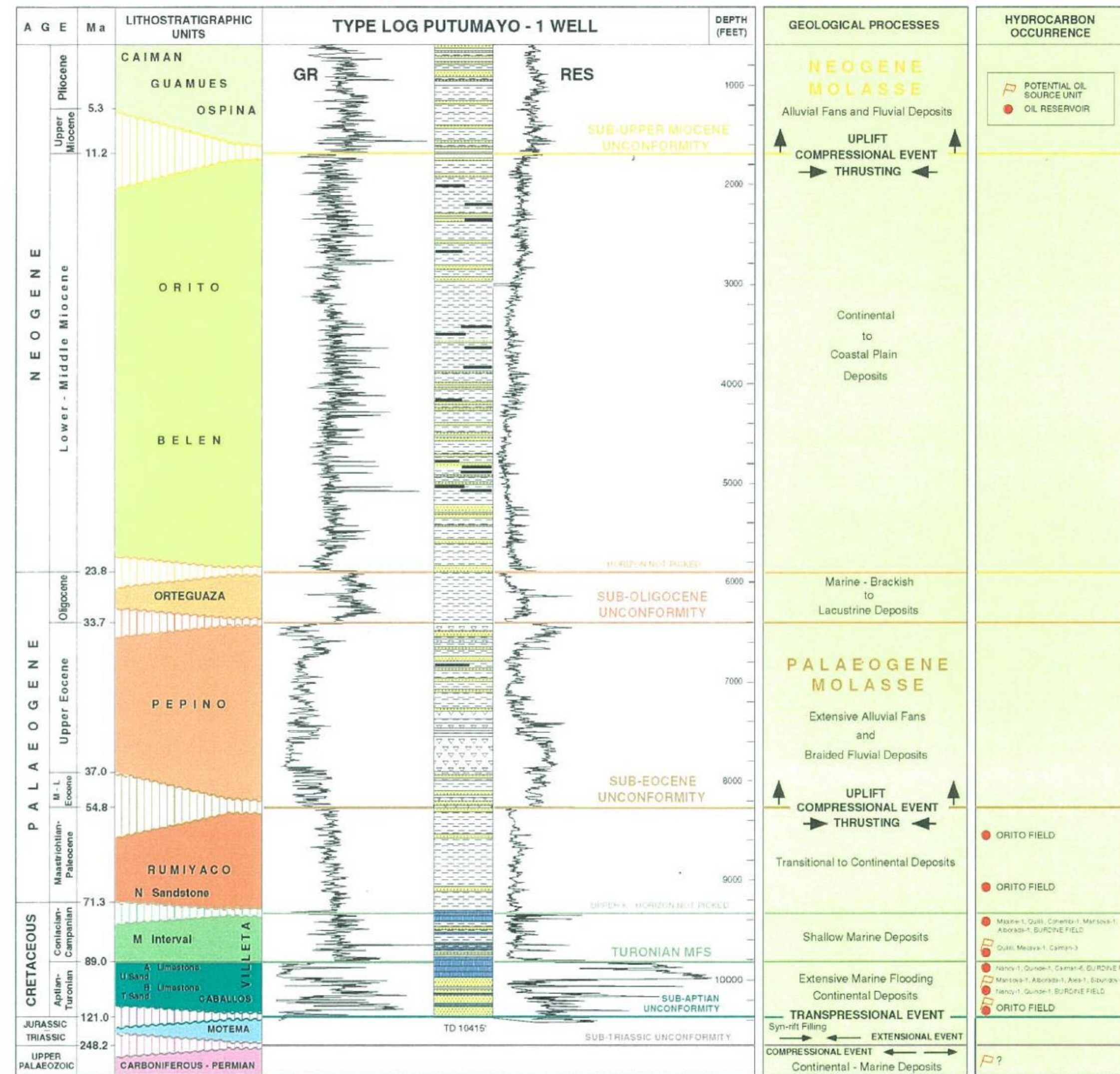


From Caiman to Solita-1

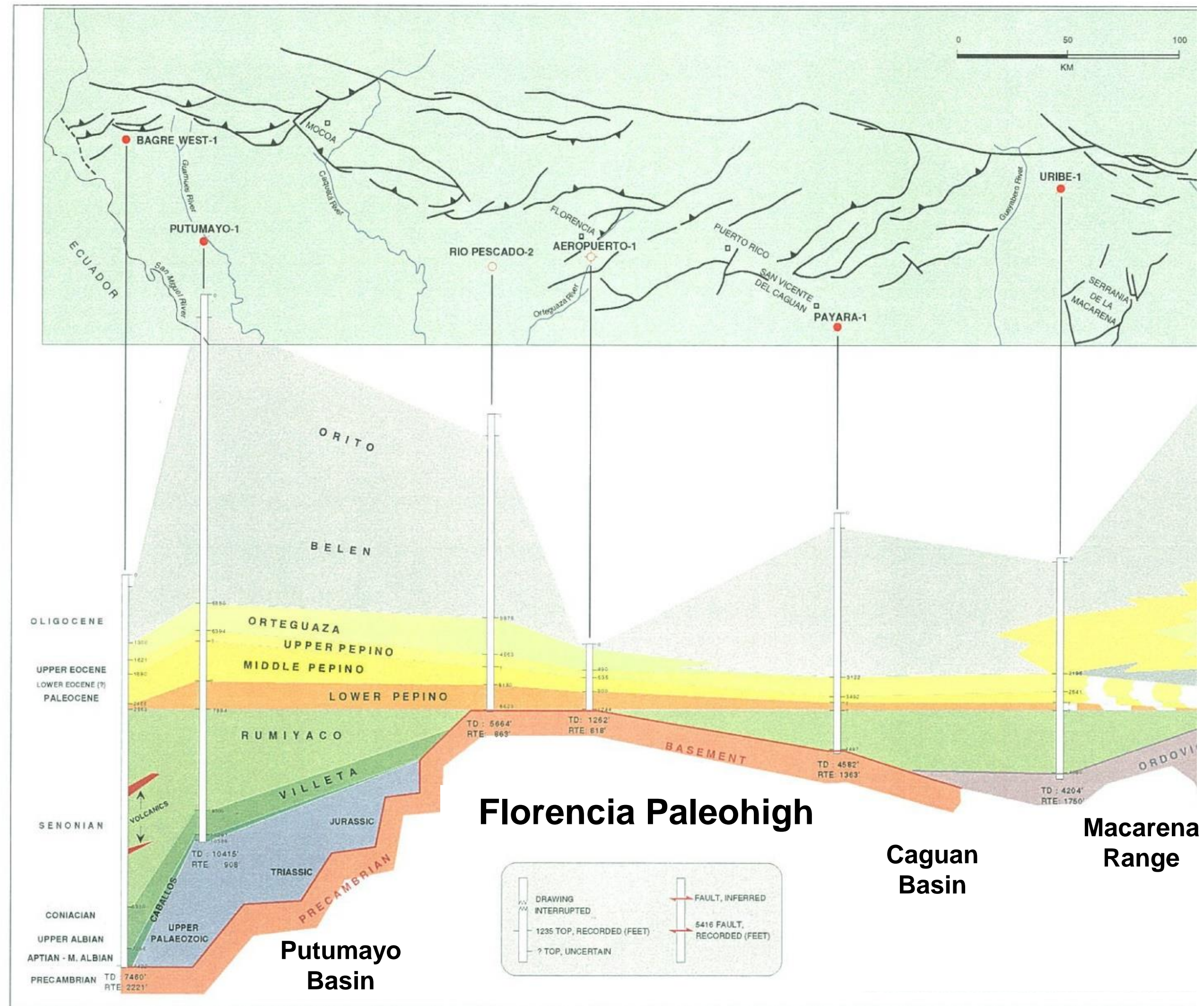
Stratigraphic Column of the Putumayo Basin

PERIOD	STRATIGRAPHIC UNIT	LITHOLOGY	ROCK			REMARKS
			R	SL	SR	
QUATERNARY						
NEOGENE	CAIMAN Fm.					Continental shales
	OSPINA Fm.					
	ORITO BELEN Gr.					
PALEOGENE	ORTEGUAZA Fm.					Sandstones and Conglomerates
	PEPINO Fm.					
	RUMIYACO Fm.					
	VILLETA Fm. (Int. N, Int. M2, Int. A, Int. U, Int. B, Int. T, Int. C)					
CRETACEOUS	Caballos Fm.					Sandstones
	Saldaña Fm.					non explored potential target
JURASSIC	Payande Fm.					
TRIASSIC						
PRECAMBRIC	Basement					

R= RESERVOIR SL= SEAL SR= SOURCE

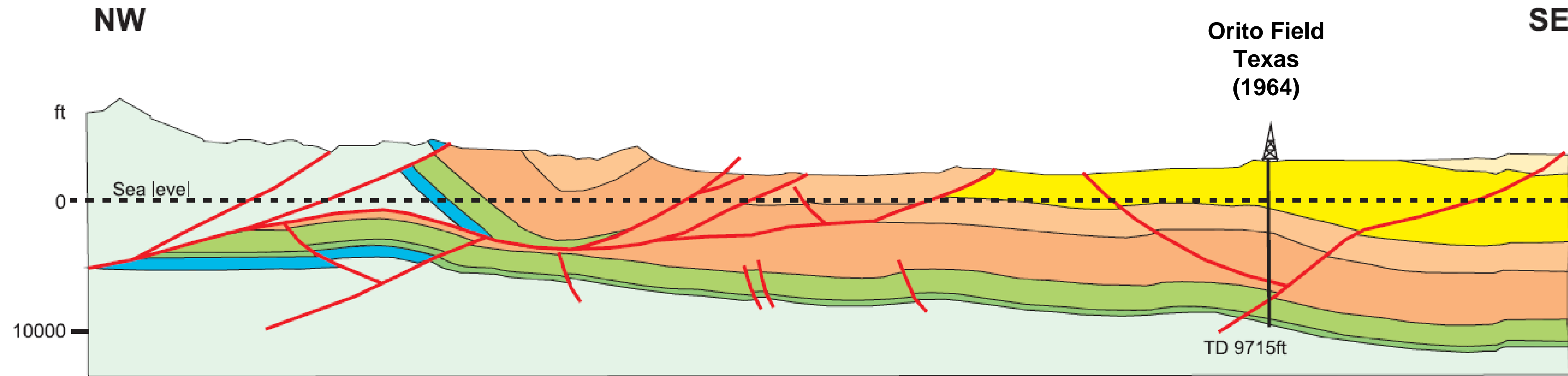


SW-NE Well Stratigraphic Correlation along the Foothills of the Putumayo & Caguan Basins

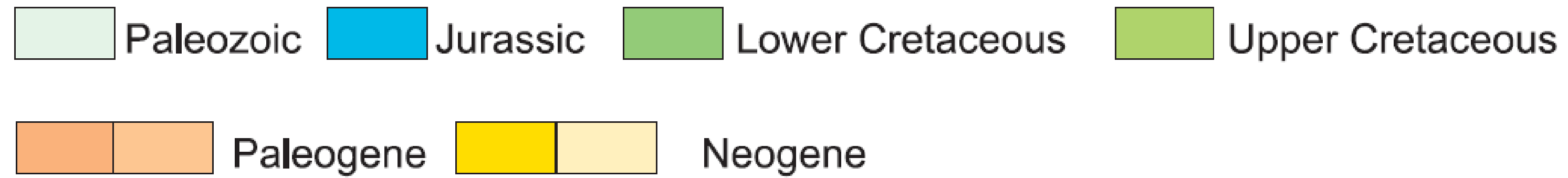


Source: Atlas Sismico 1998

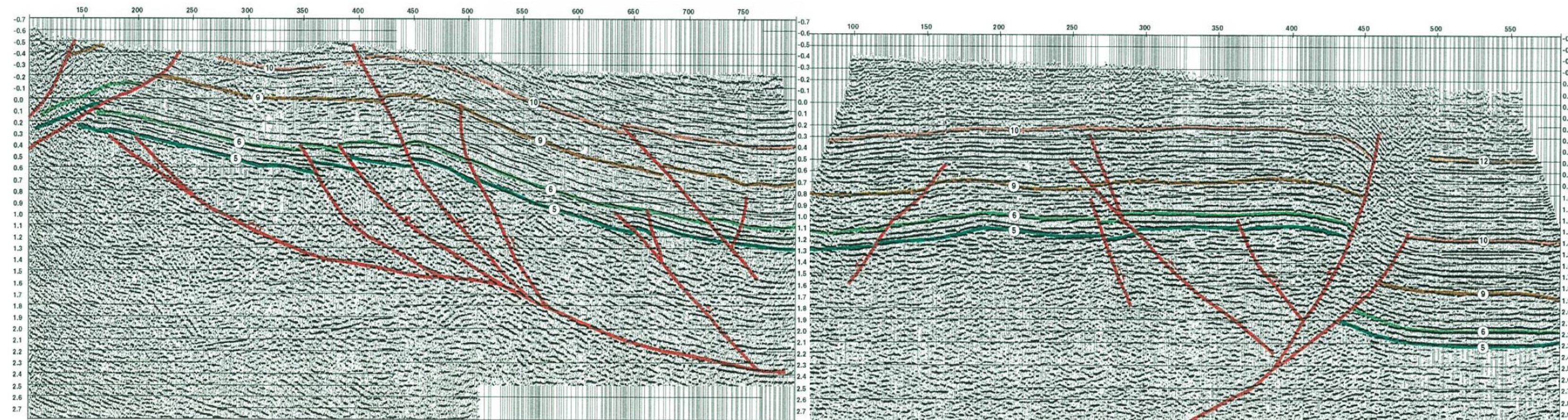
Regional NW-SE Structural Section of the Putumayo Basin



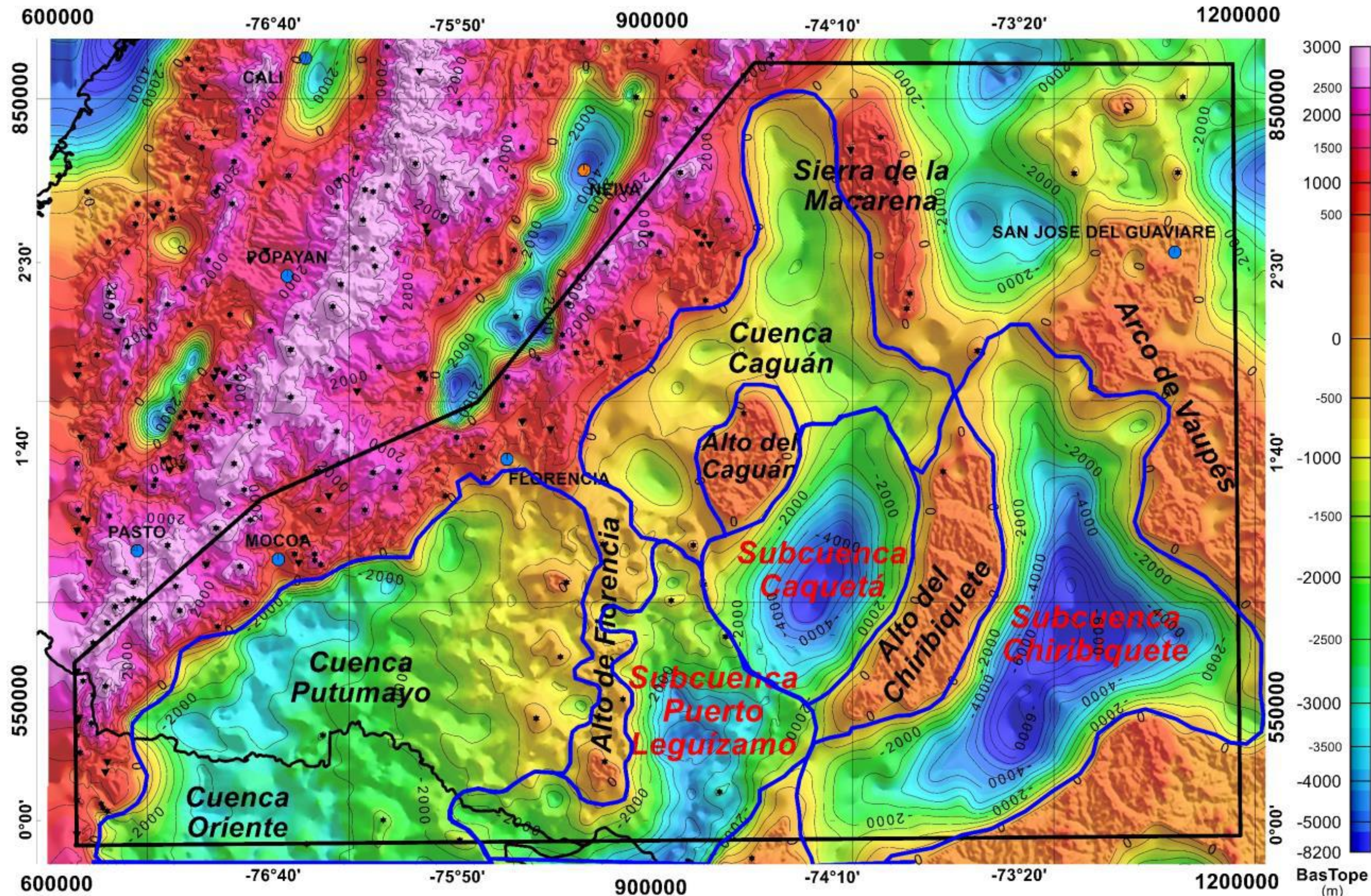
Color code according to the commission for the Geological Map of the World (2005)



Source: ANH



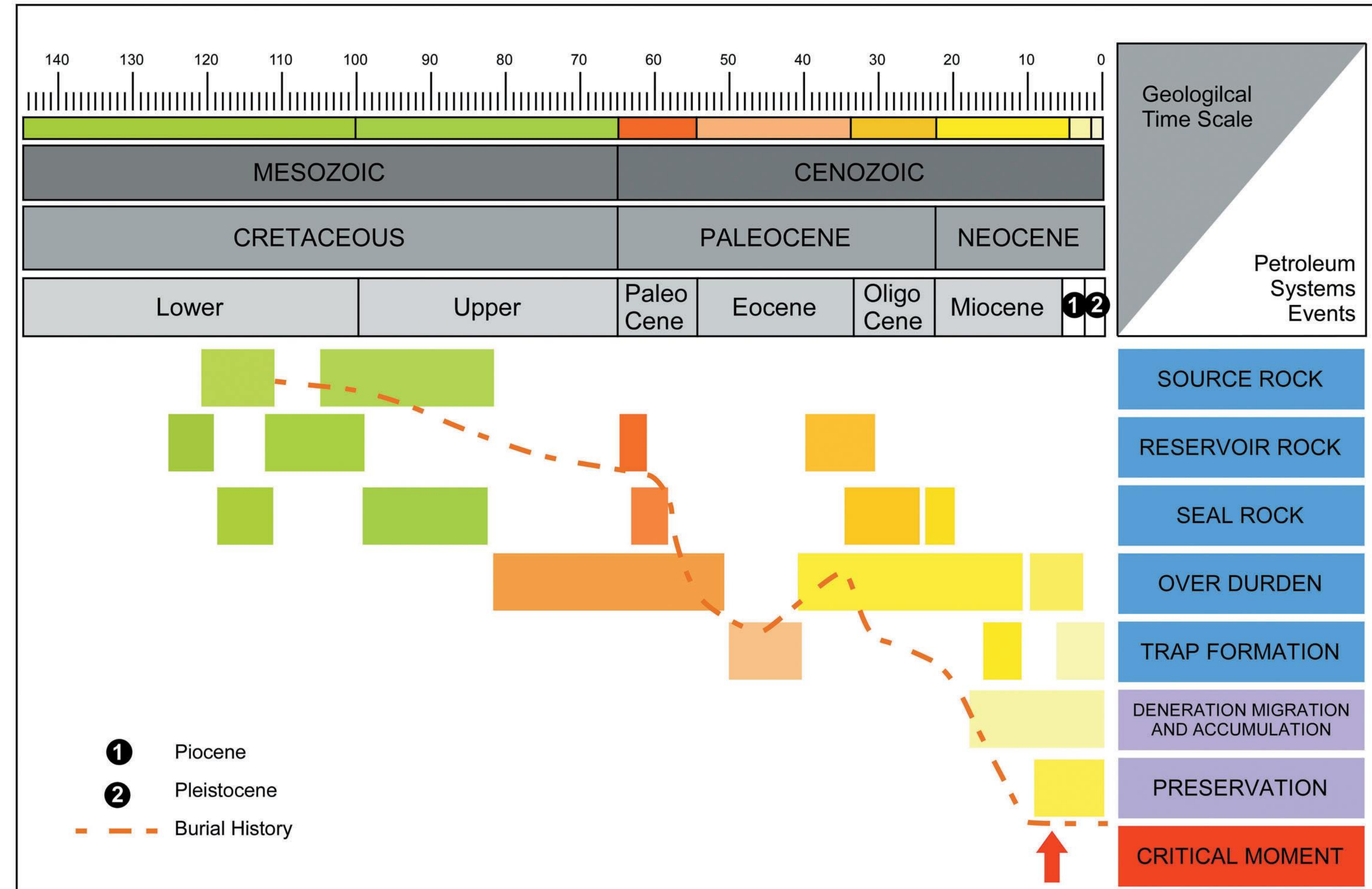
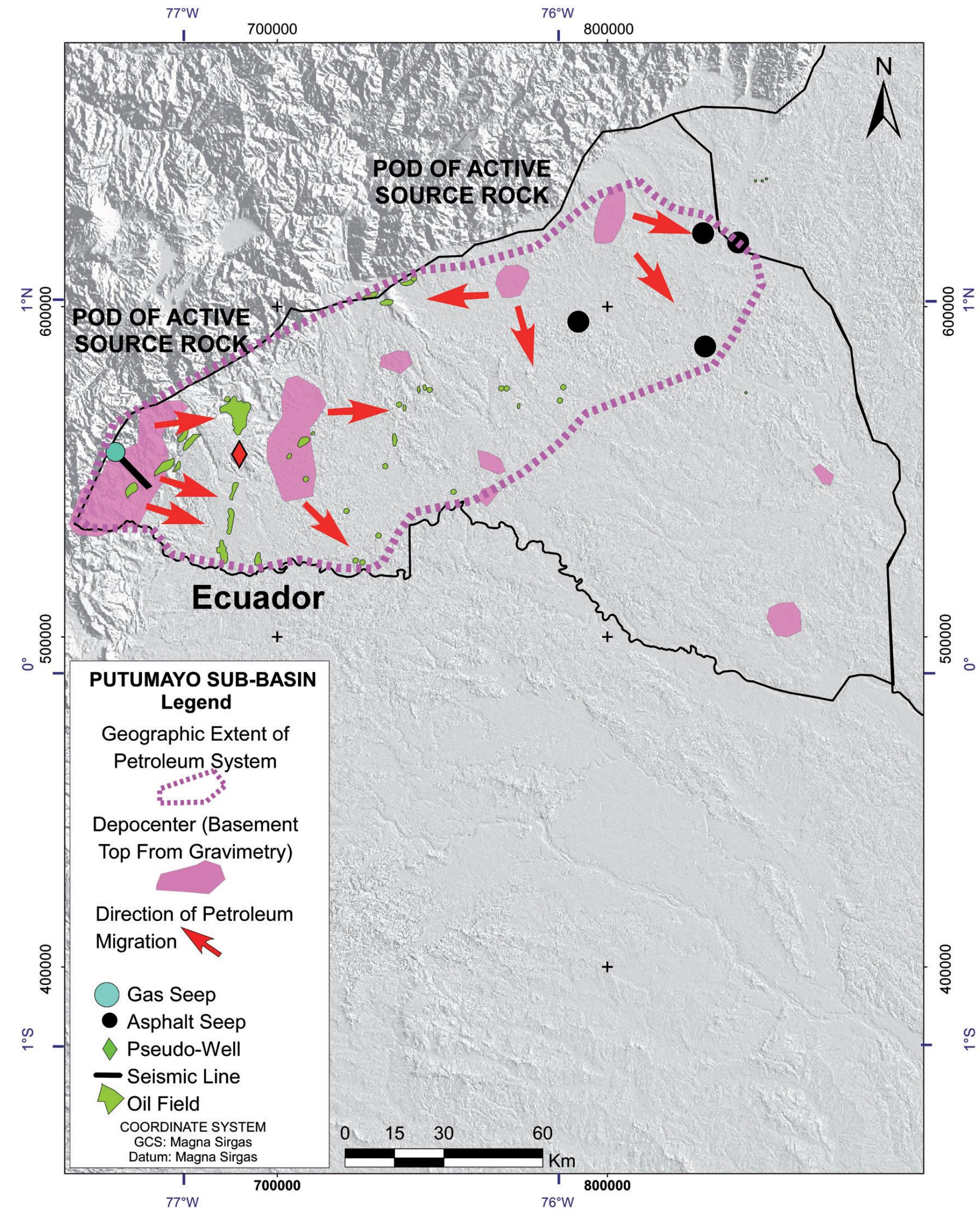
Basement Top from Gravimetric Inversión of Putumayo & Caguan Basins



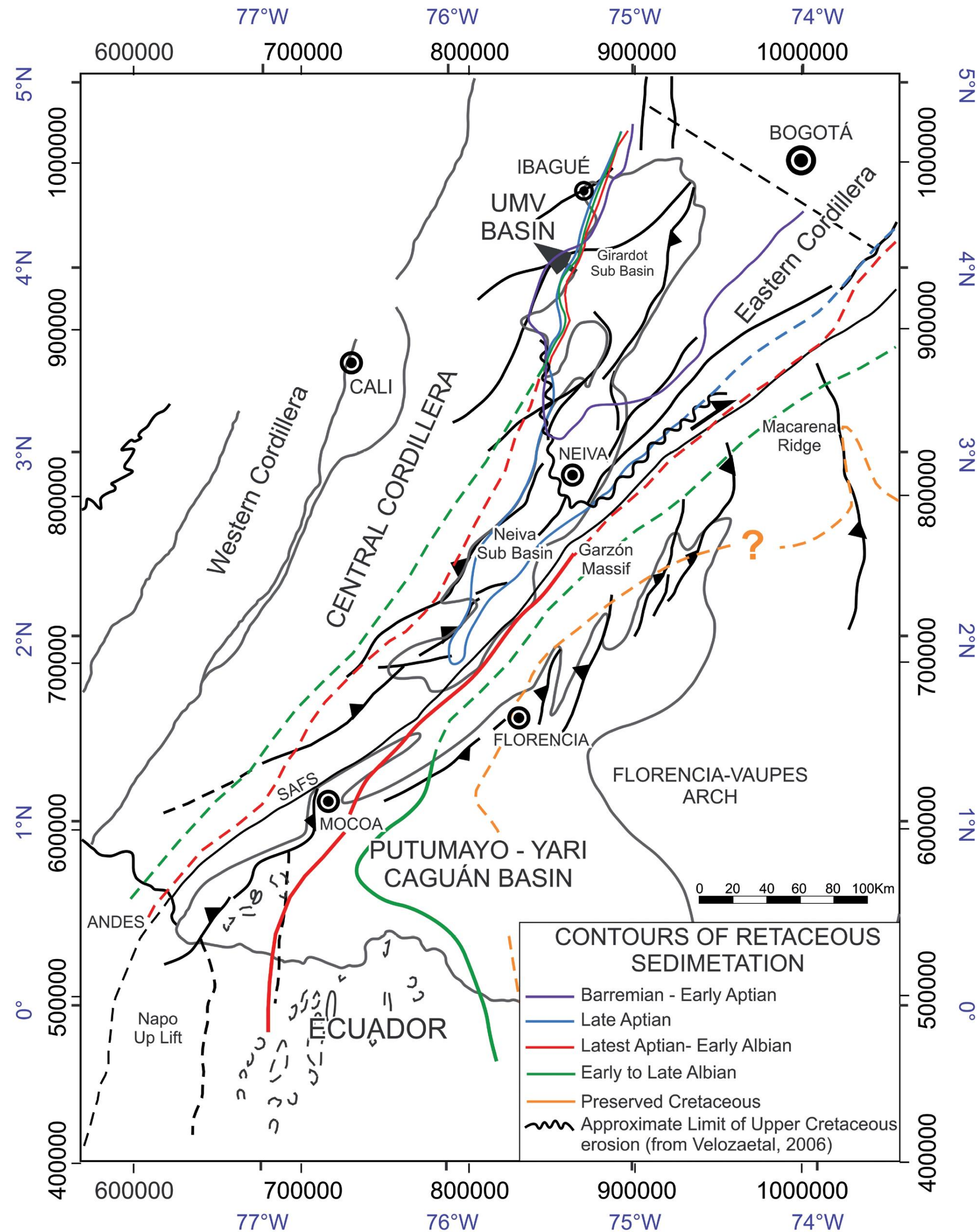
Topo del Basamento y Cuencas Relacionadas
Inversión Gravimétrica 3D del Residuo Controlado
Referencia: Nivel medio del mar
Autor: Álvaro Vargas Gómez

0 50000 100000
(metros)
MAGNA-SIRGAS / Colombia Bogota zone

Source: Vargas, 2020



Distribution of Cretaceous Sequences in Southern Colombia and Northern Ecuador



Putumayo Basin Overview

Stratigraphic Column & Regional Xsections

Bouguer Anomaly Map

Petroleum Systems Map & Event Chart

Northern Zone

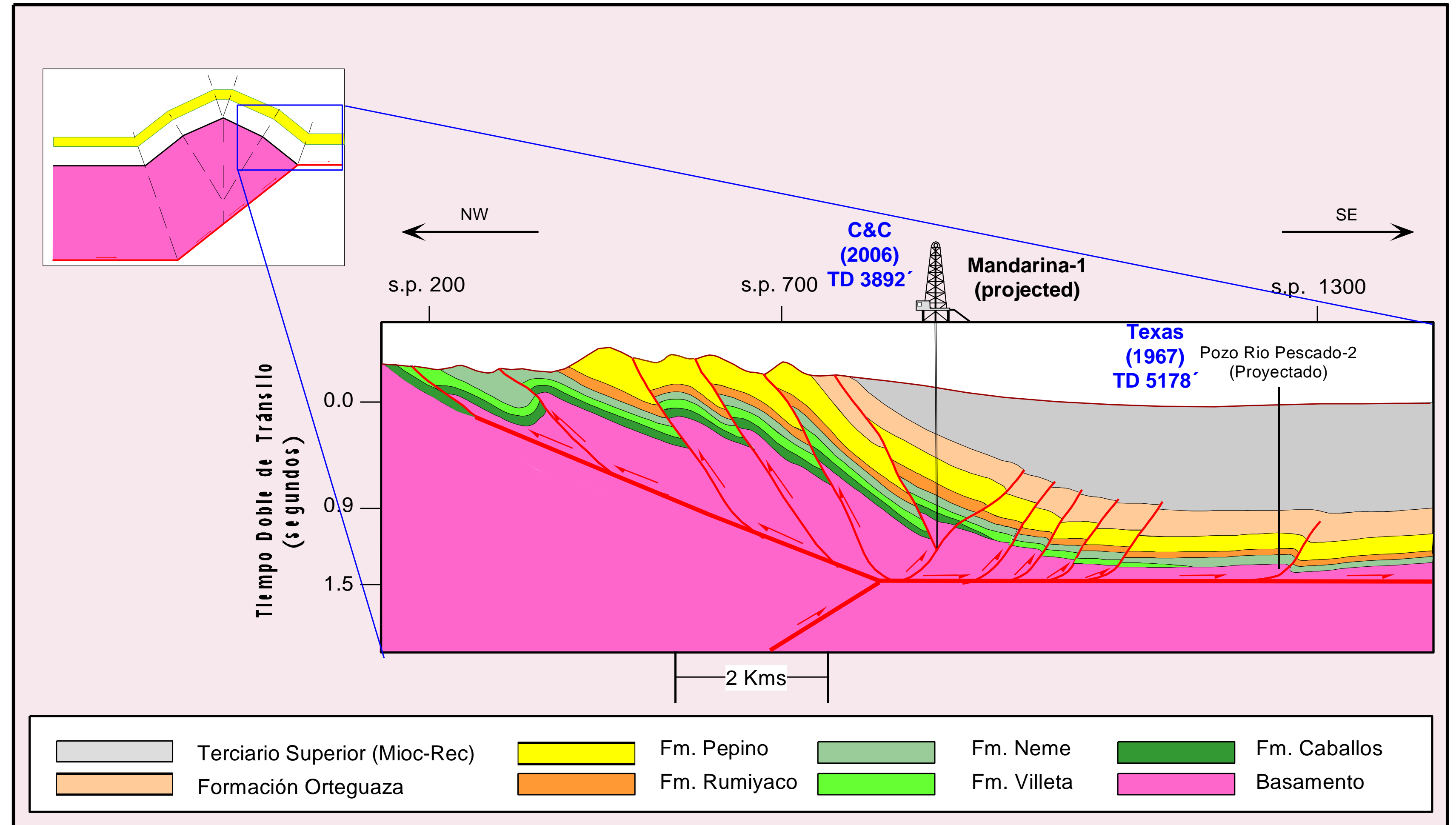
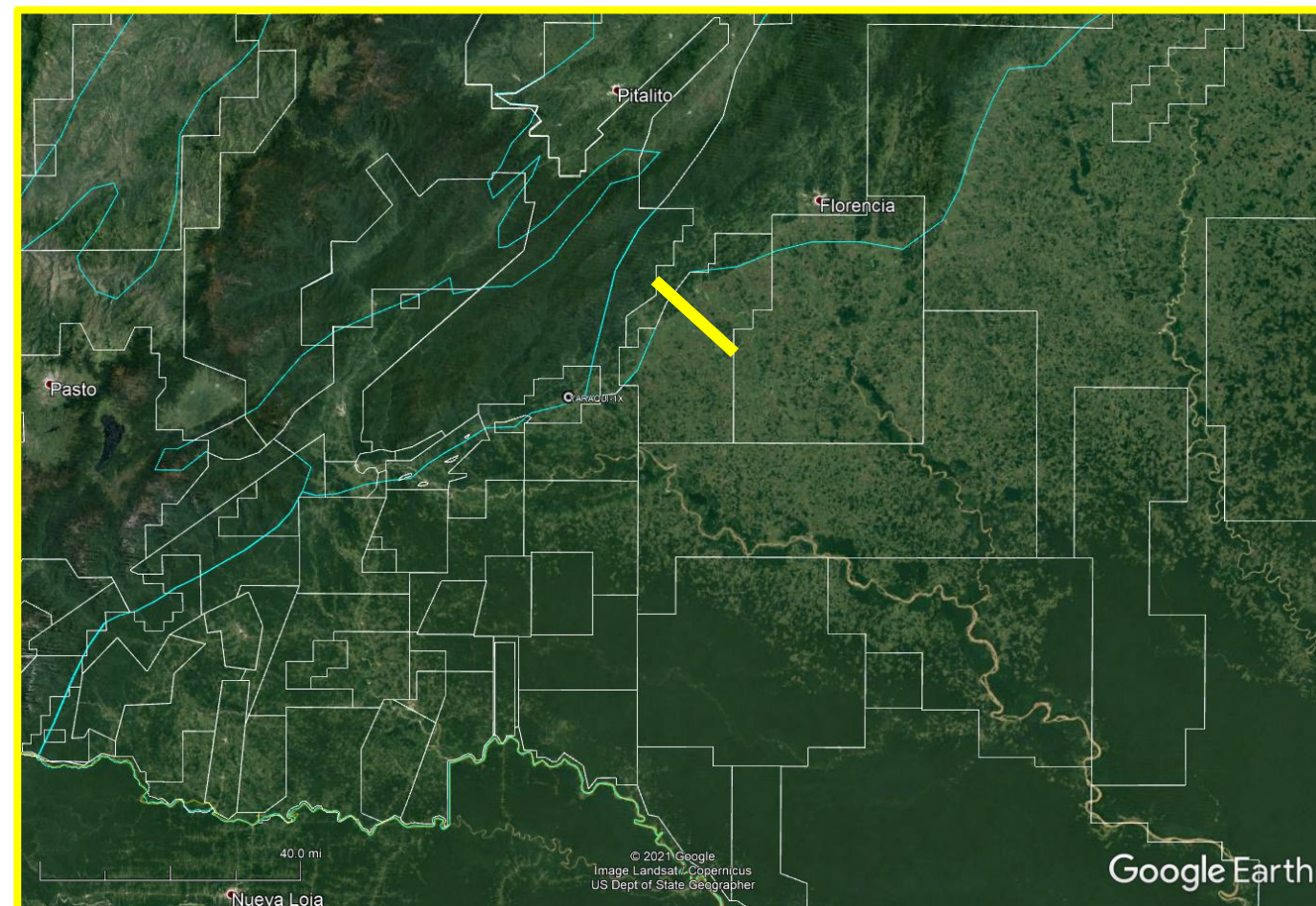
From Rio Pescado to Unicornio

Central Zone

From Condor to Alea

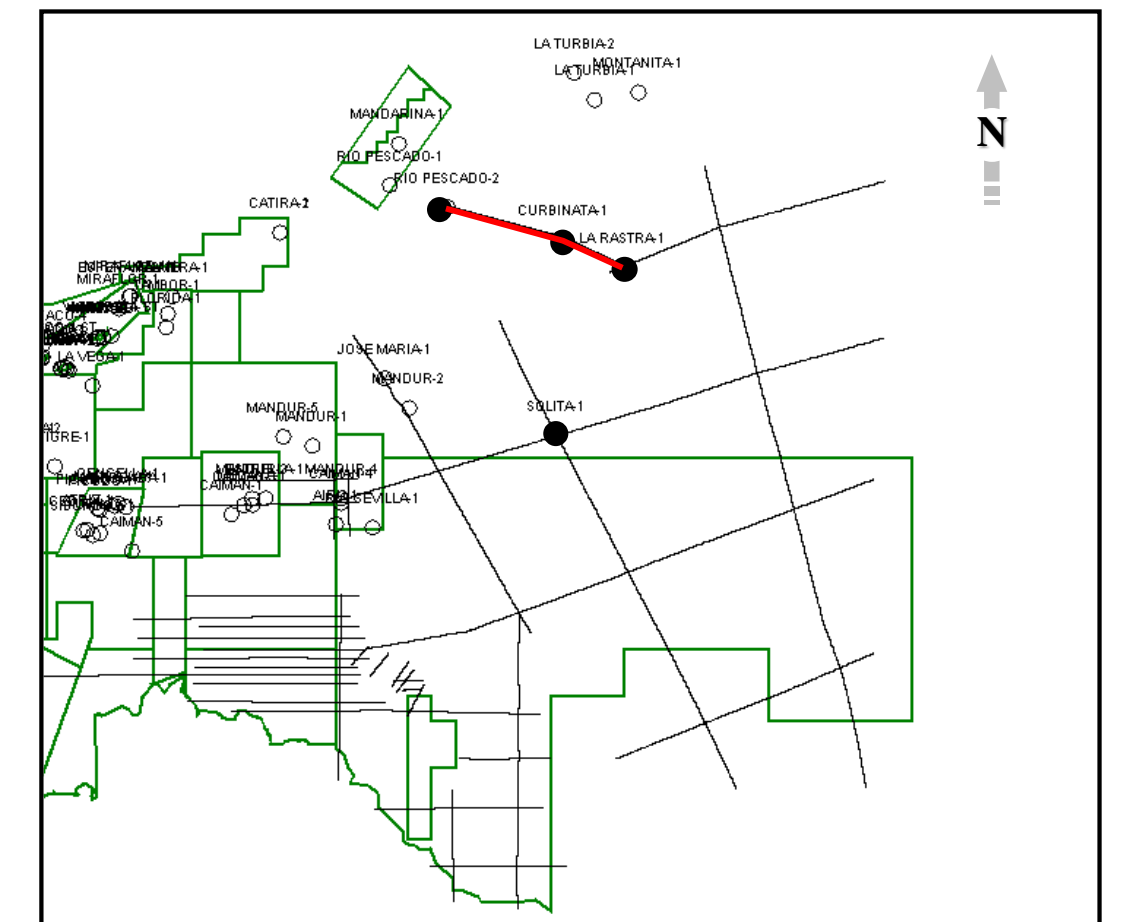
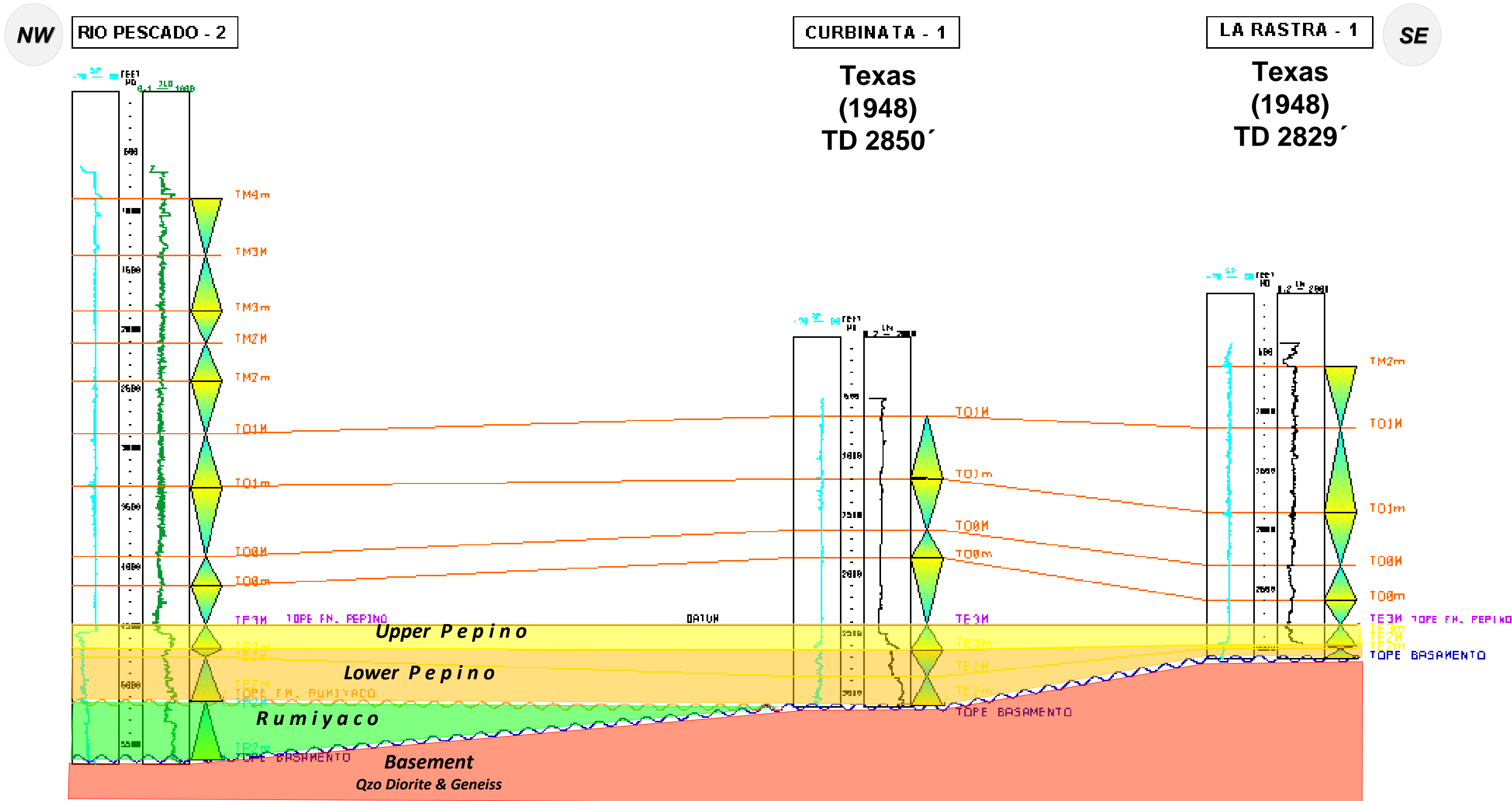
Eastern Zone

From Caiman to Solita-1



Source: ICP 1998

NW-SE Stratigraphic Correlation of the Río Pescado-2, Curbinata-1 & La Rastra-1 Wells (Pepino Fm Top as datum)



From ICP, 1998

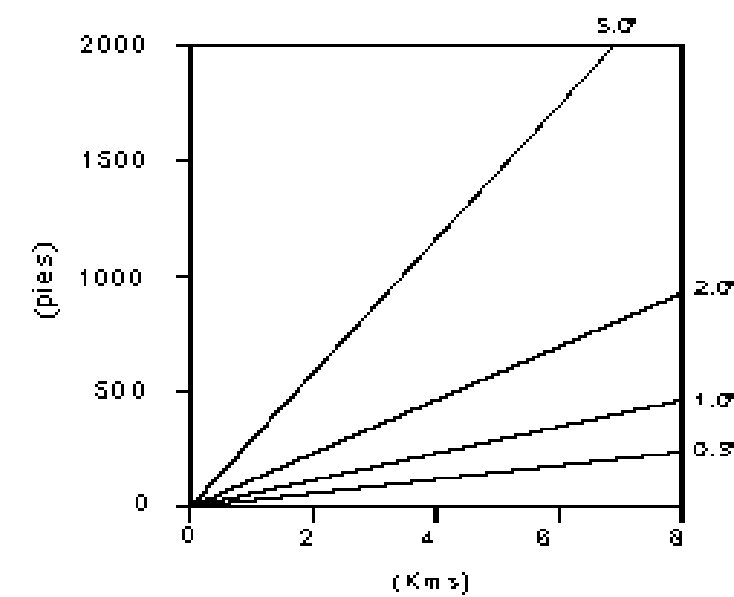
CONVENCIONES



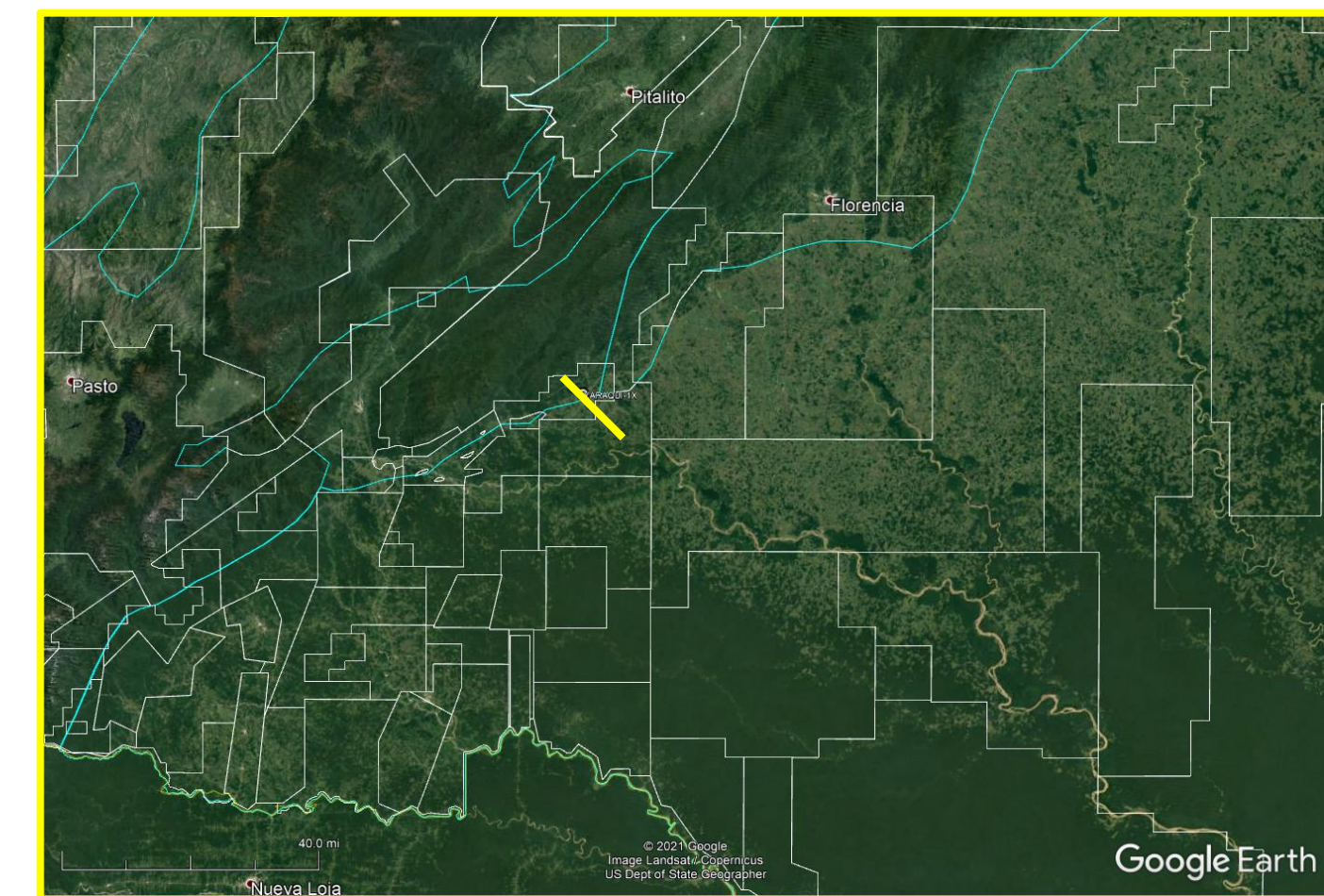
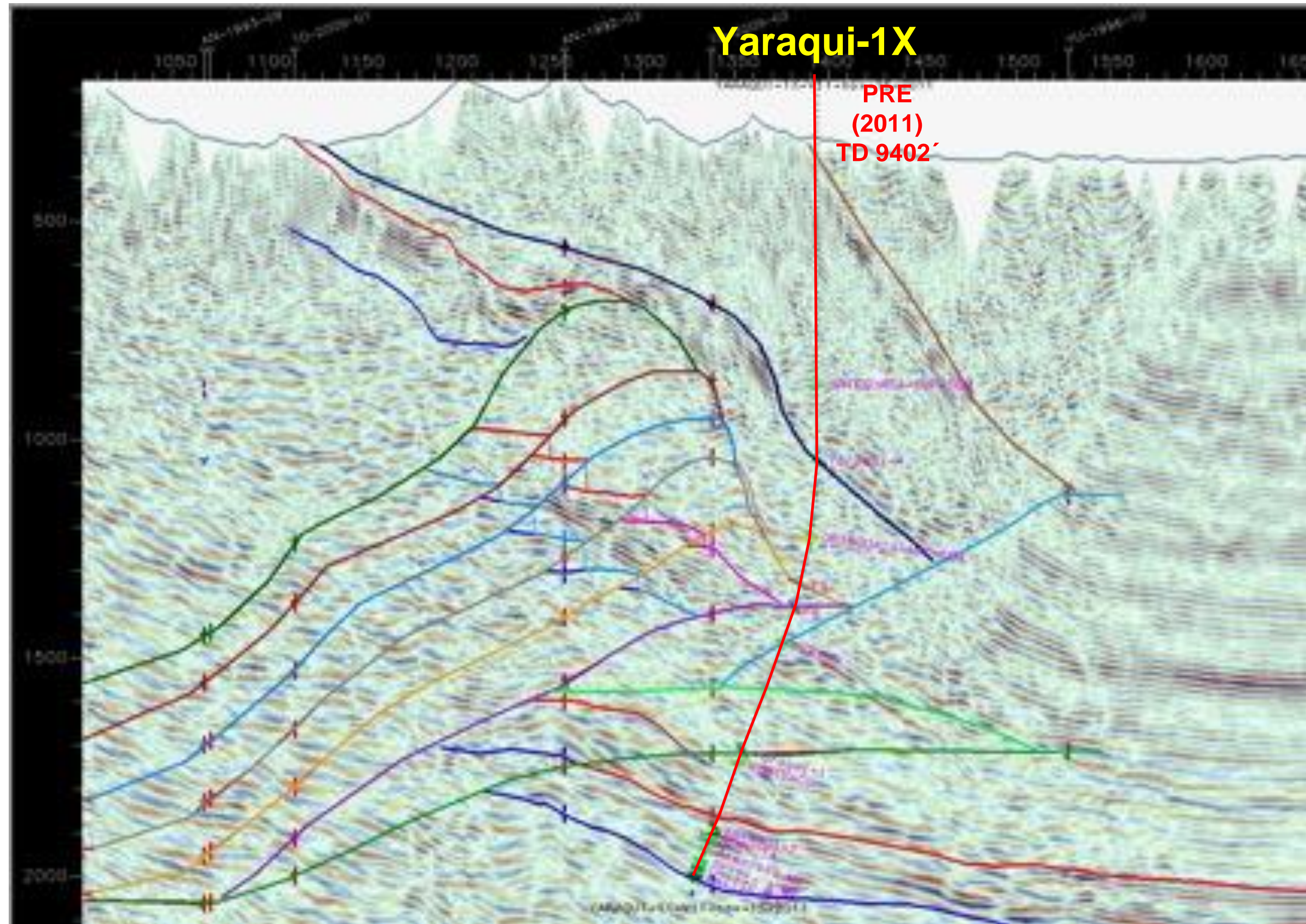
Hemético de subida del nivel base
(Aumento de la relación A/S)



Hemético de caída del nivel base
(Disminución de la relación A/S)

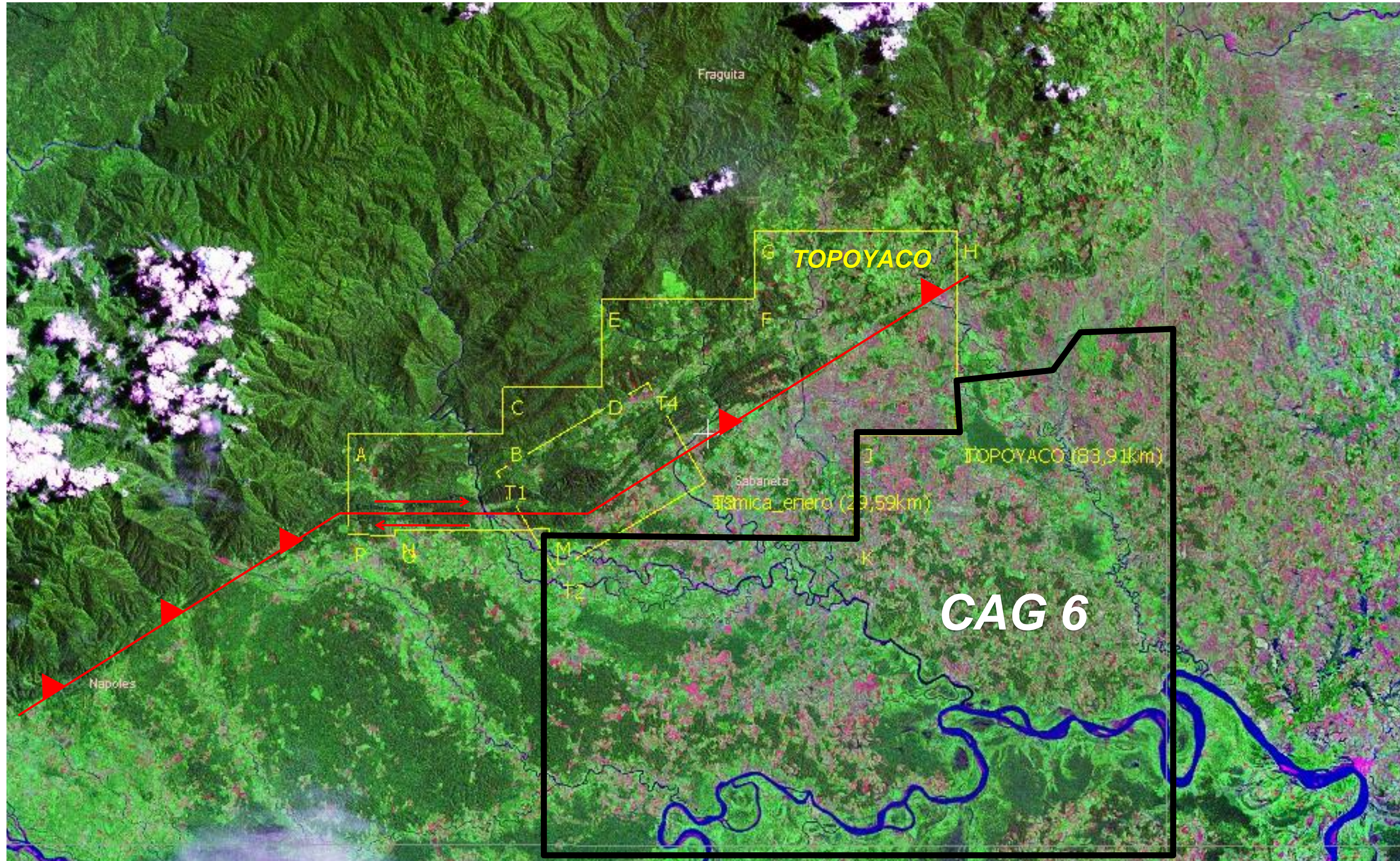


Putumayo Basin – Topoyaco Area Seismic Line TO-2009-08 Yaraquí-1X well



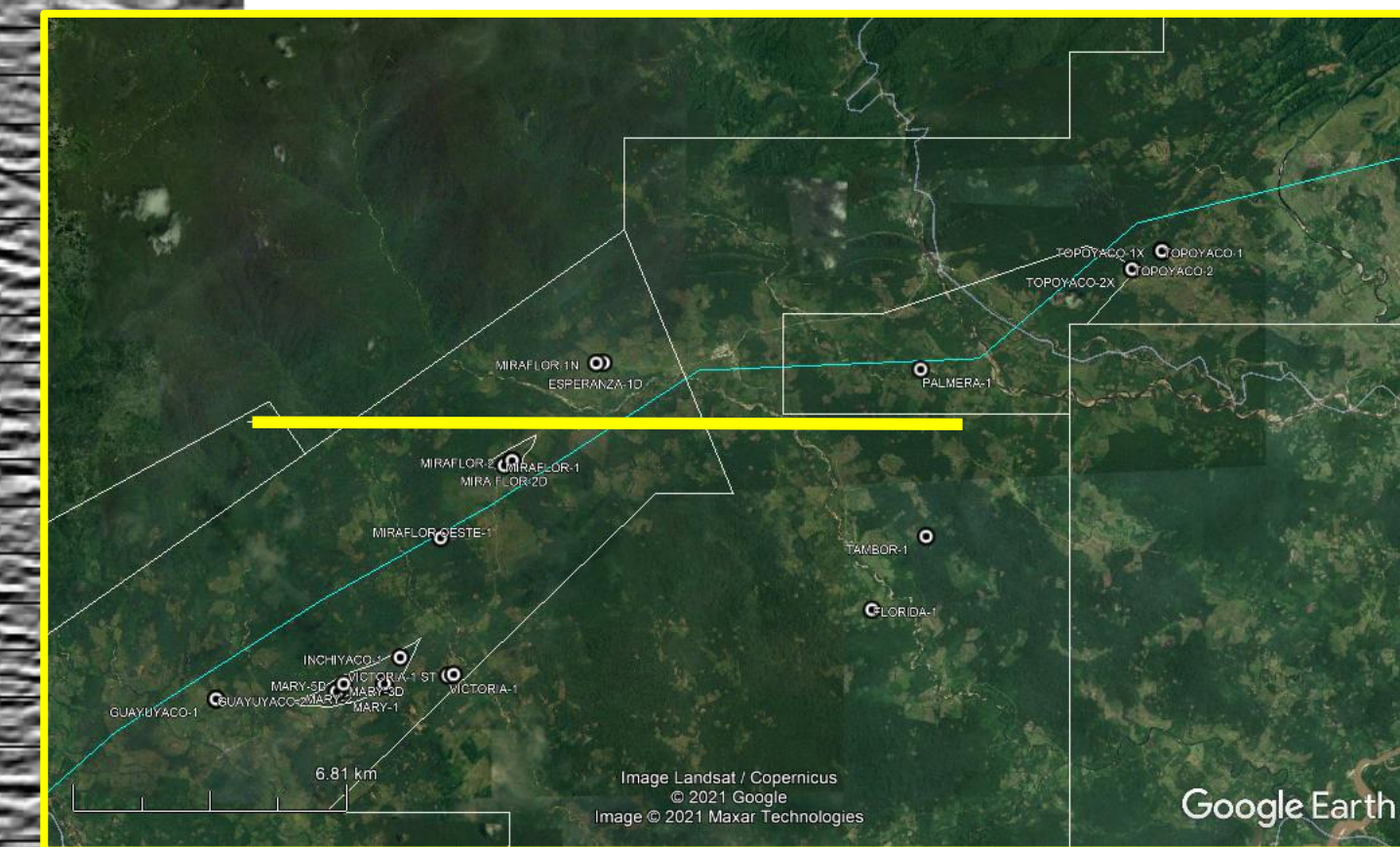
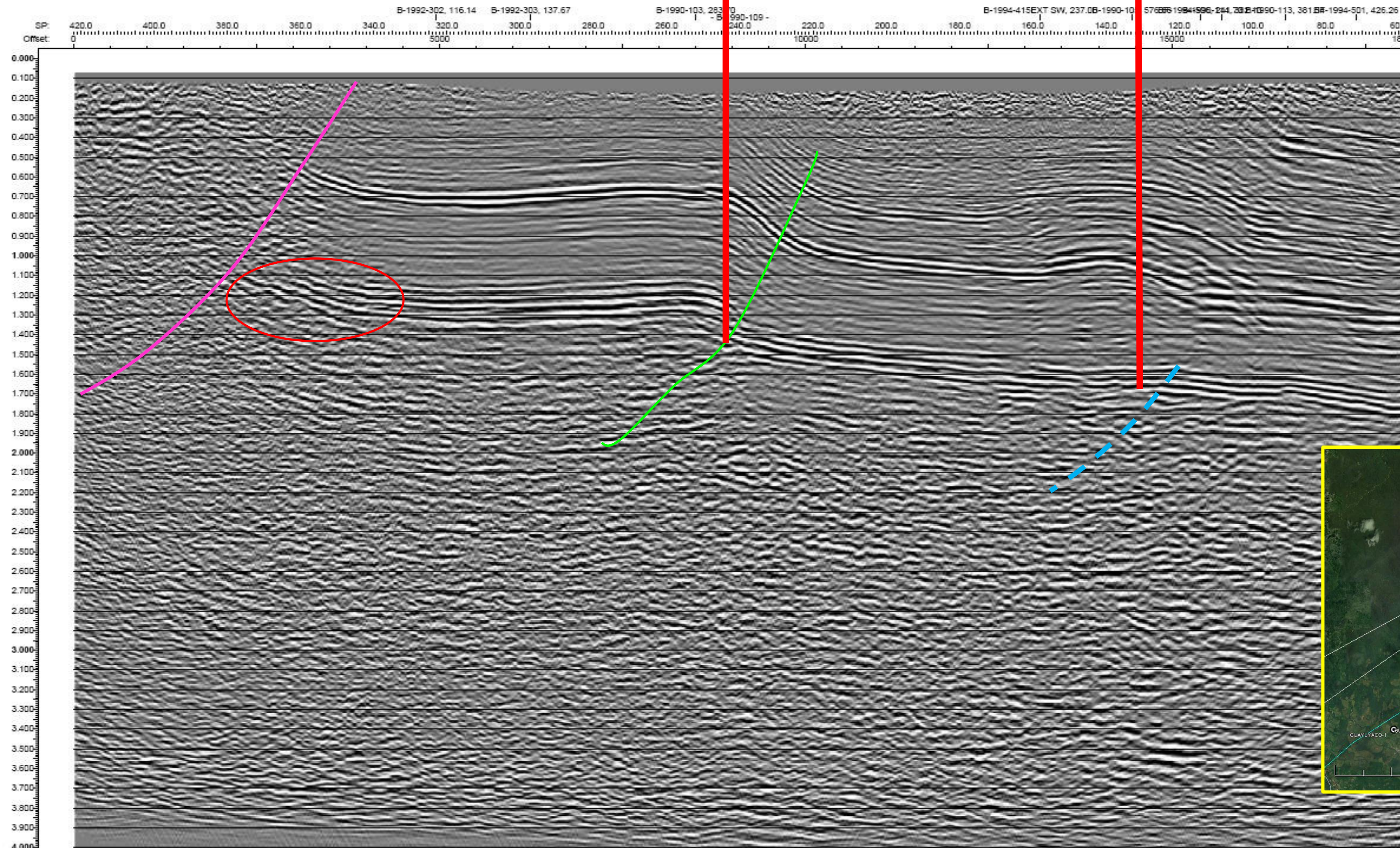
Structural model after drilling

Putumayo Basin – Topoyaco Area Structural Model Proposal



MIRAFIOR-1
Argosy (1991)
TD 6954'

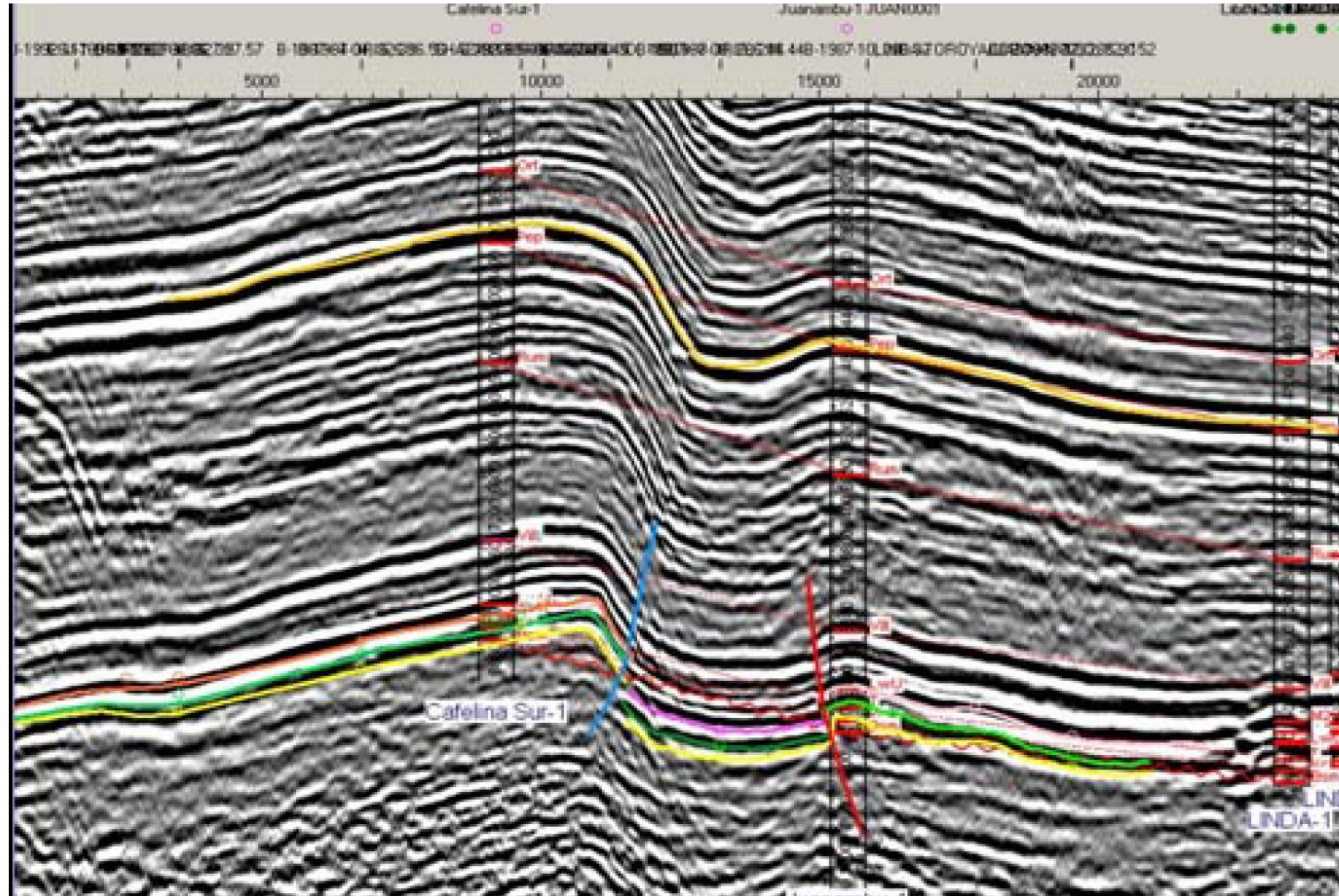
PALMERA-1
Argosy (1996)
TD 8836'



Cafelina Sur-1
Texas, 1964 TD 8621'
Costayaco Field Projected

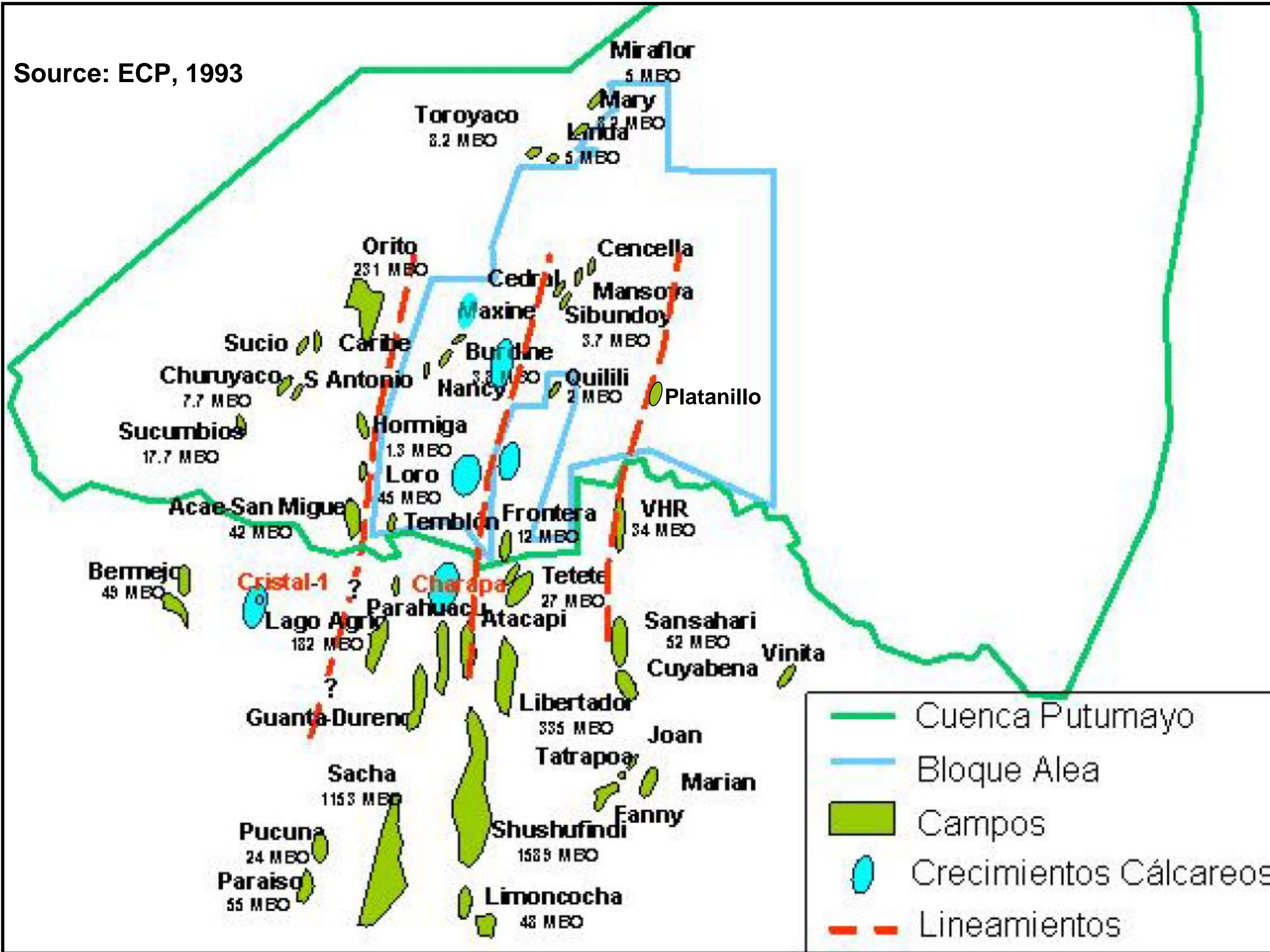
Juananbu-1
Argosy (2007) TD 9152'

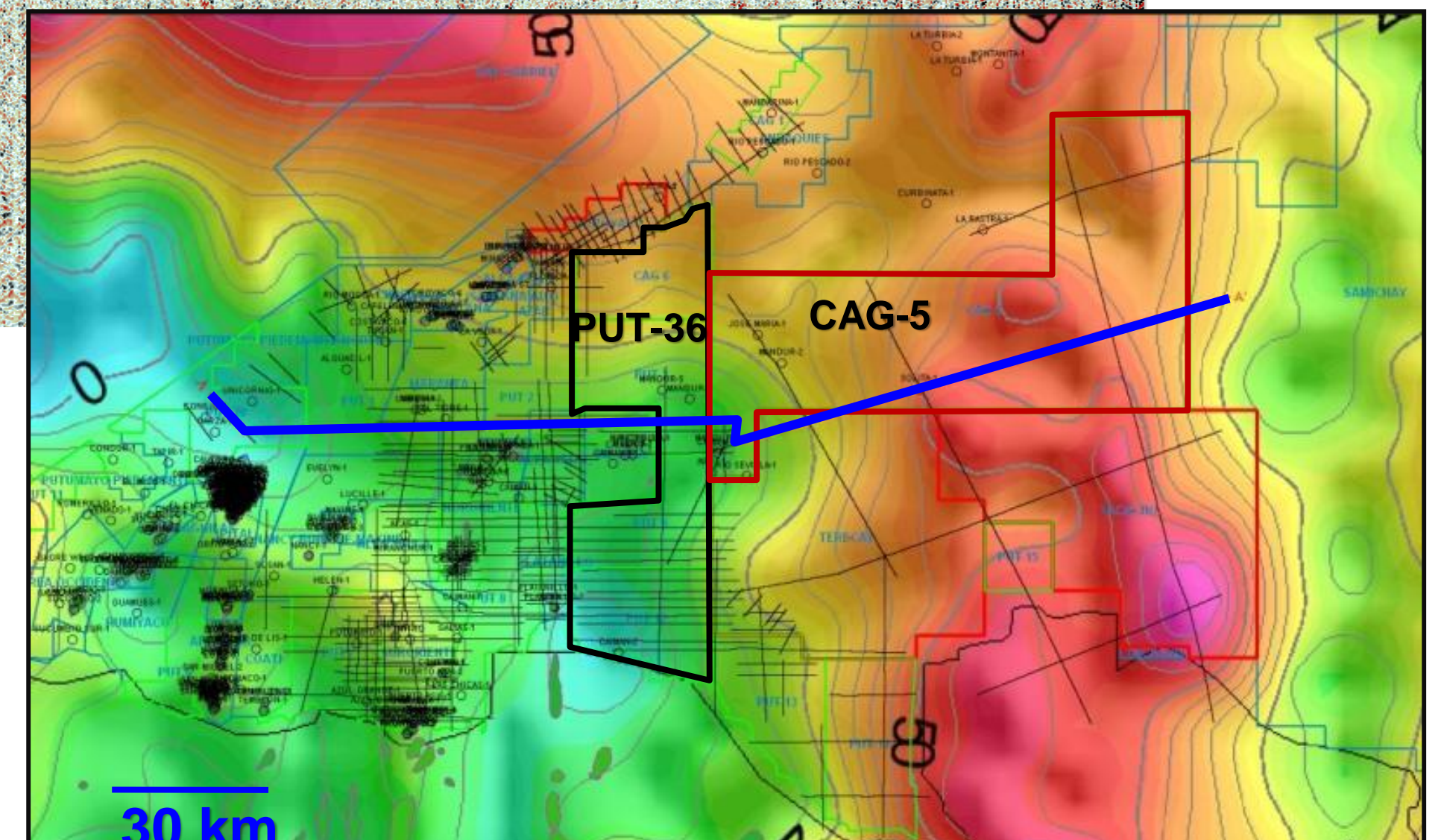
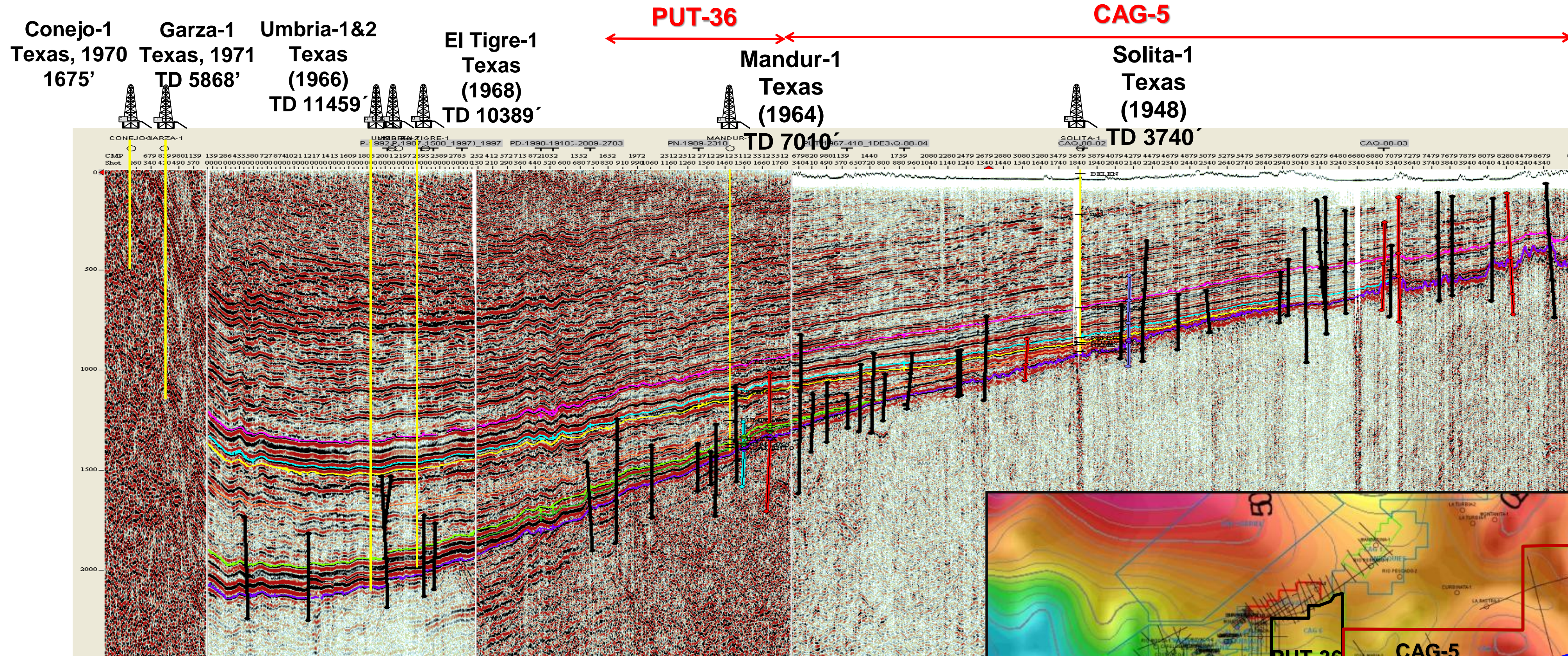
Linda-1
Argosy (1989) TD 9200'

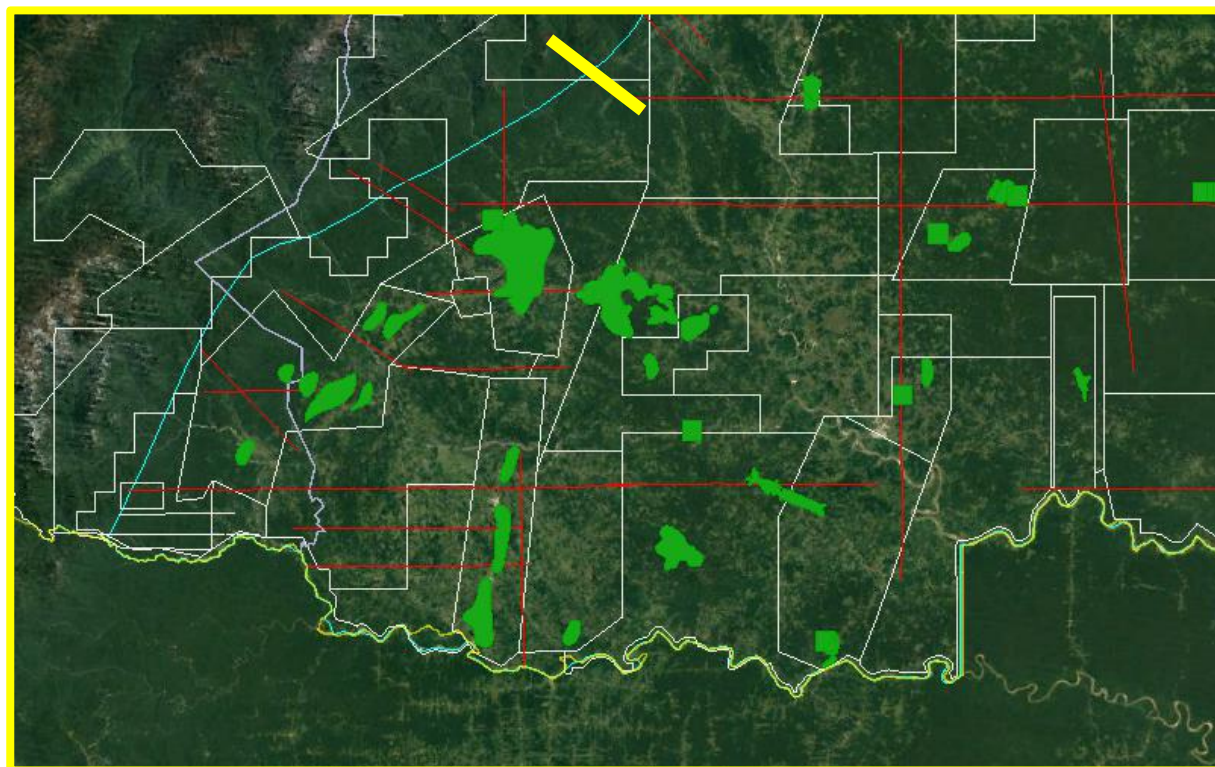
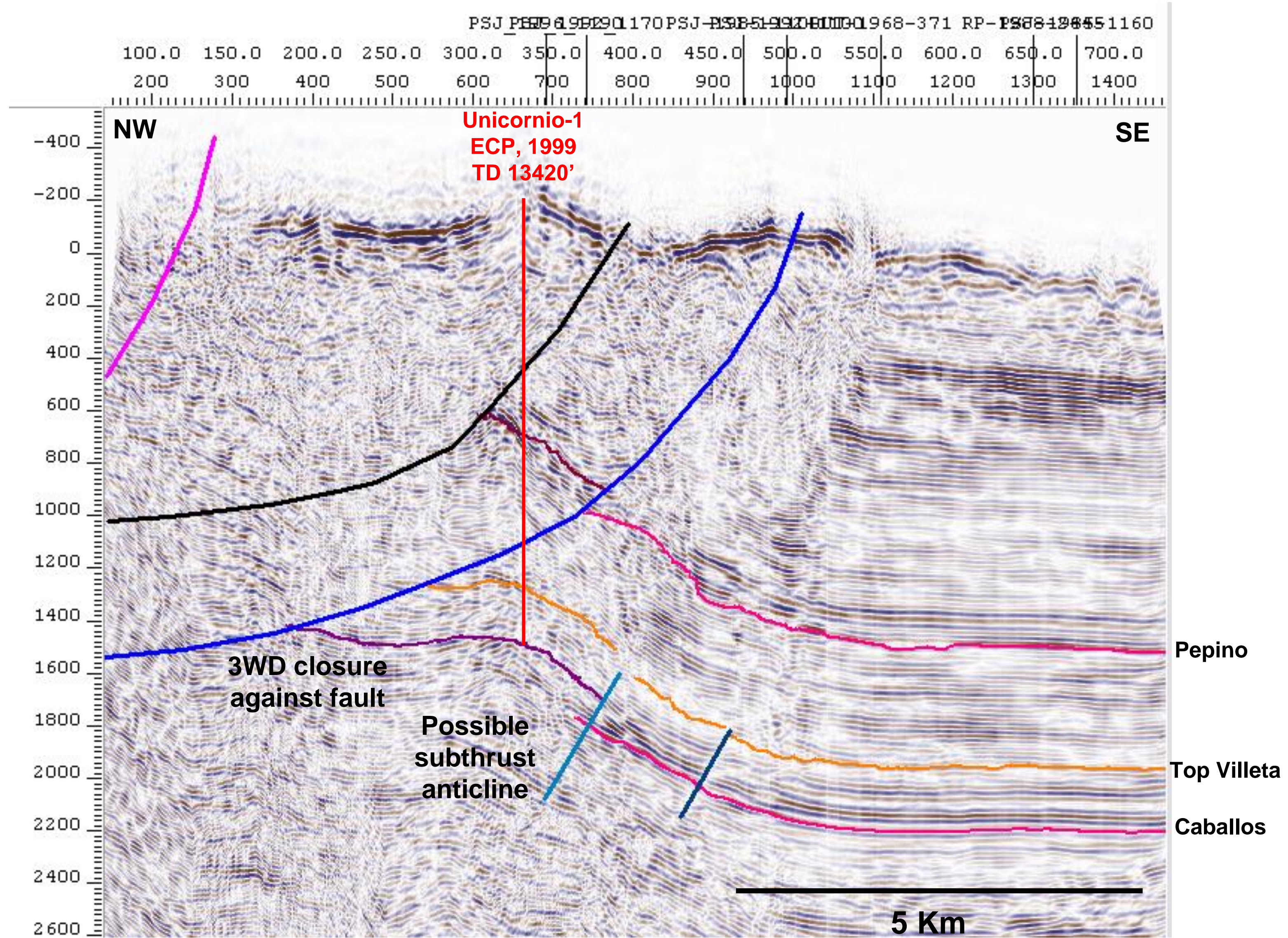


From Ramirez, C y Solano, F 2007

Putumayo & Oriente Basin Productive Trend Correlation









Putumayo Basin Overview



Stratigraphic Column & Regional Xsections



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Northern Zone



From Rio Pescado to Unicornio



Central Zone



From Condor to Alea



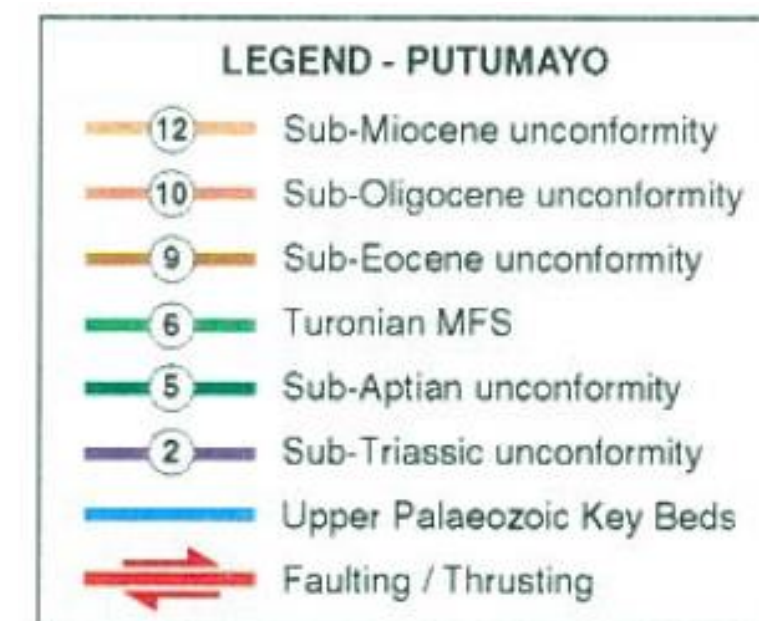
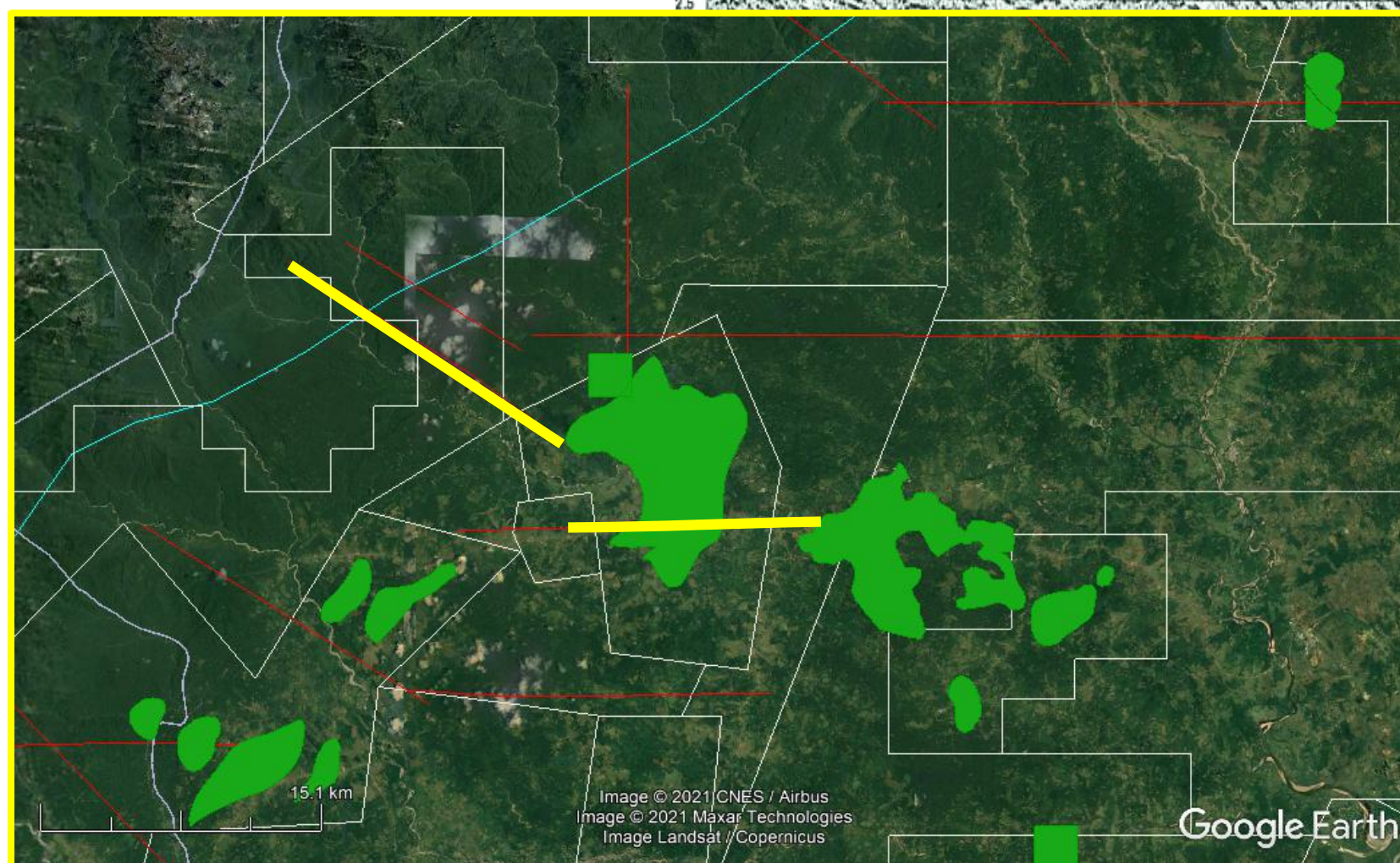
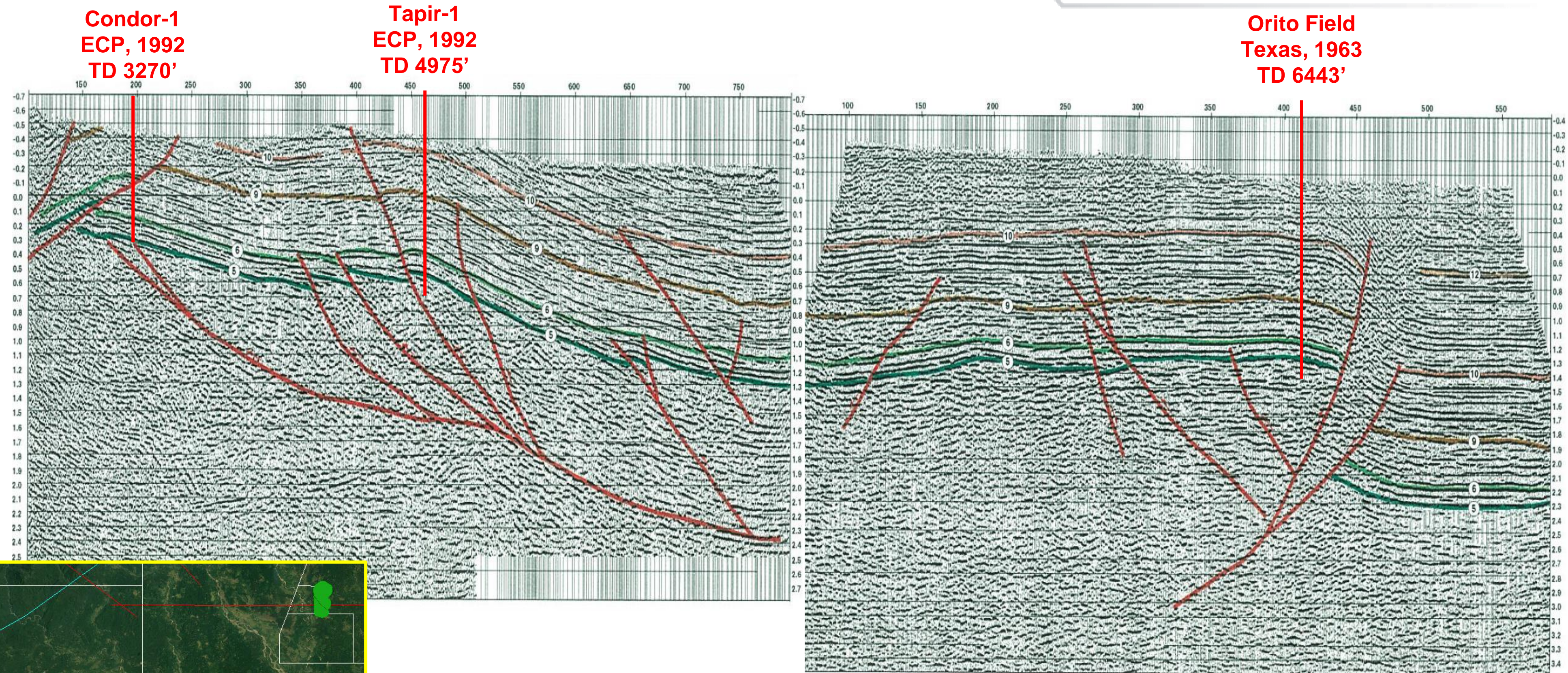
Eastern Zone



From Caiman to Solita-1

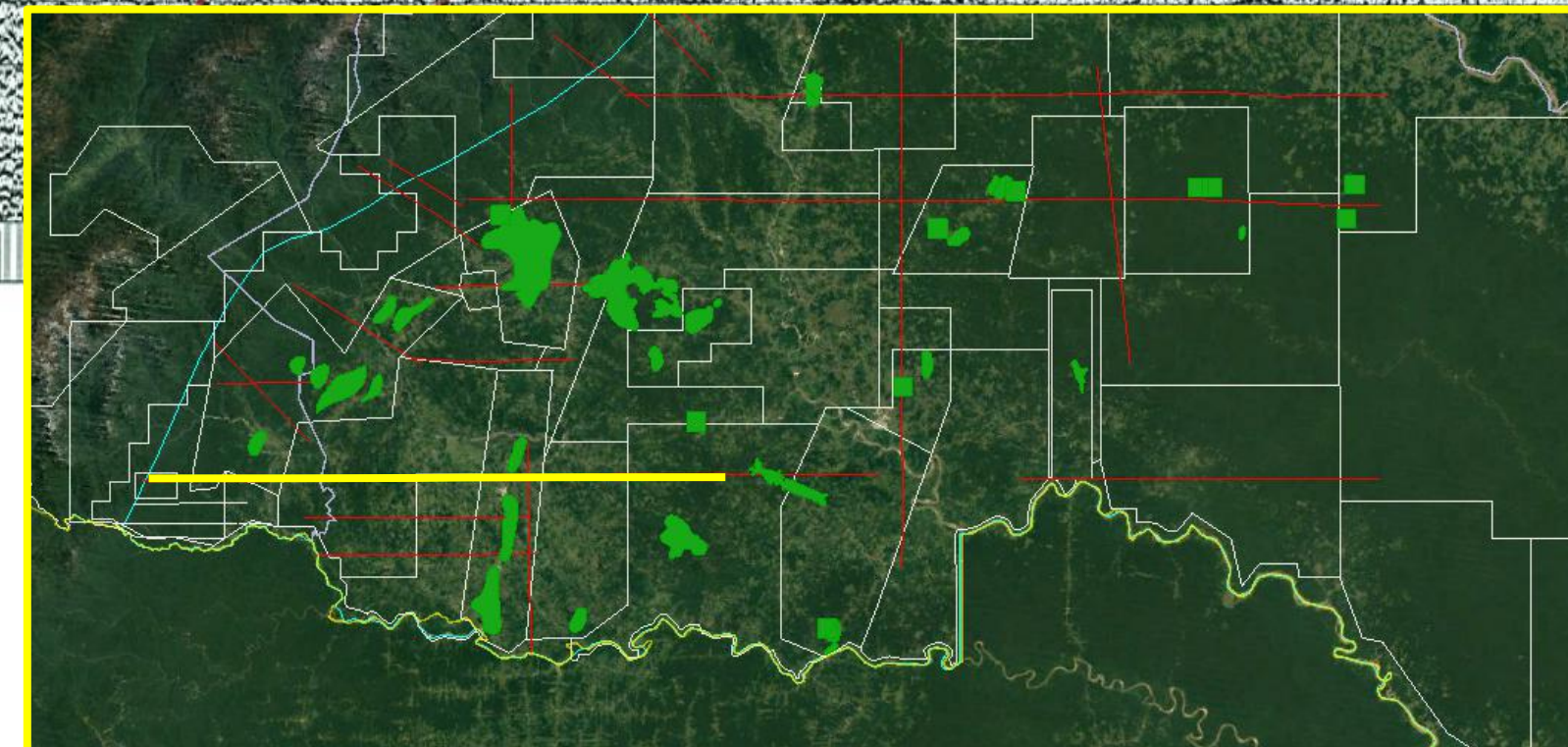
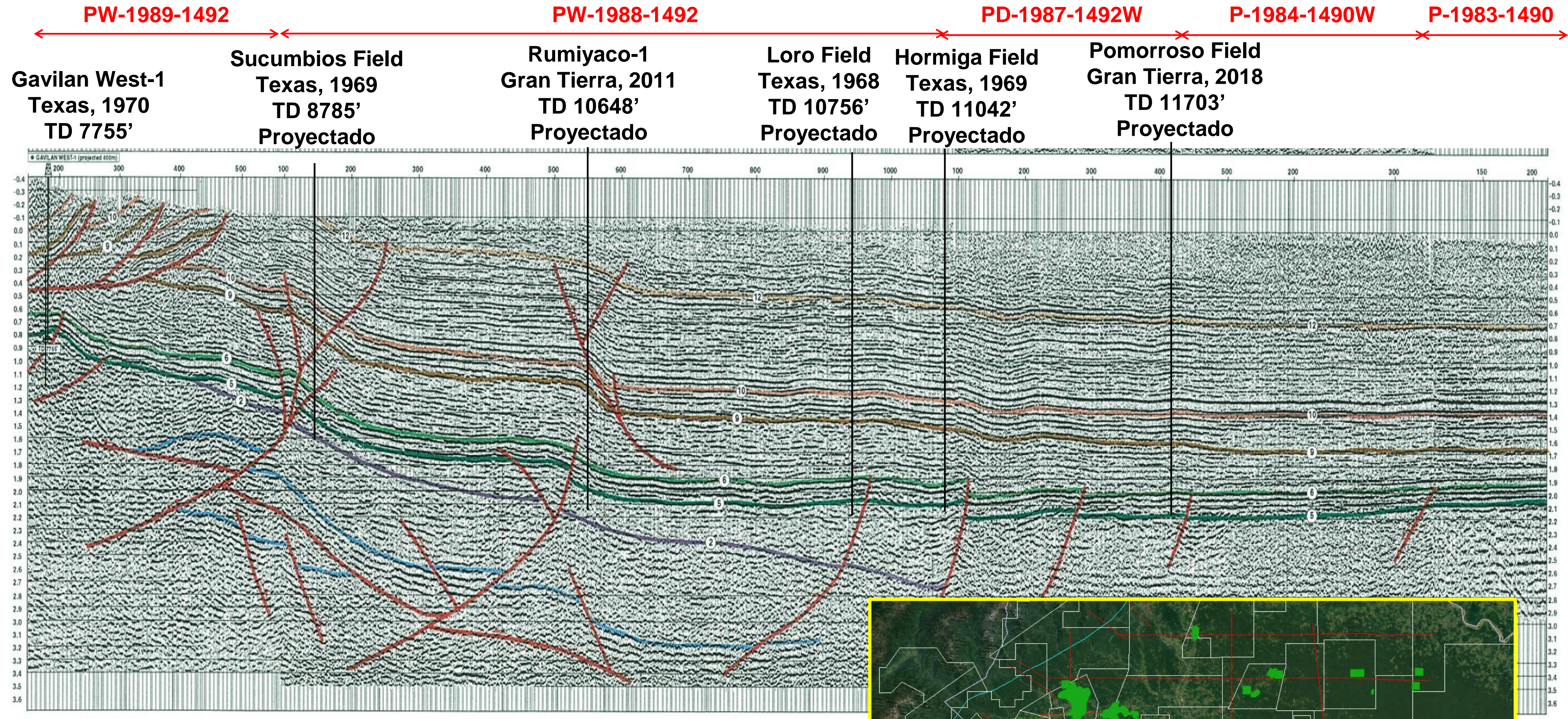
Putumayo Basin – Orito Area

Seismic Lines PWD-1990-1840 y RP-1988-1889



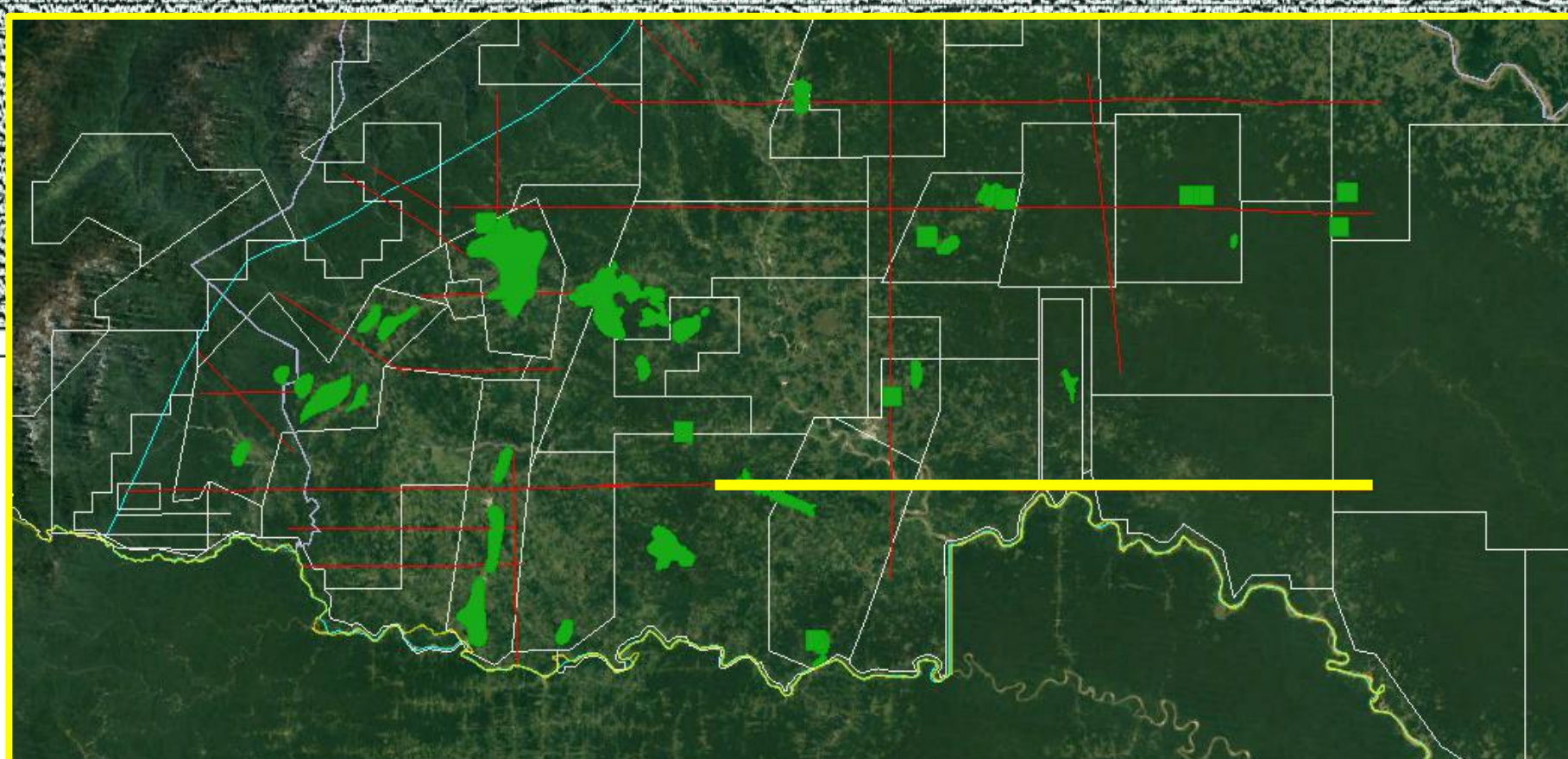
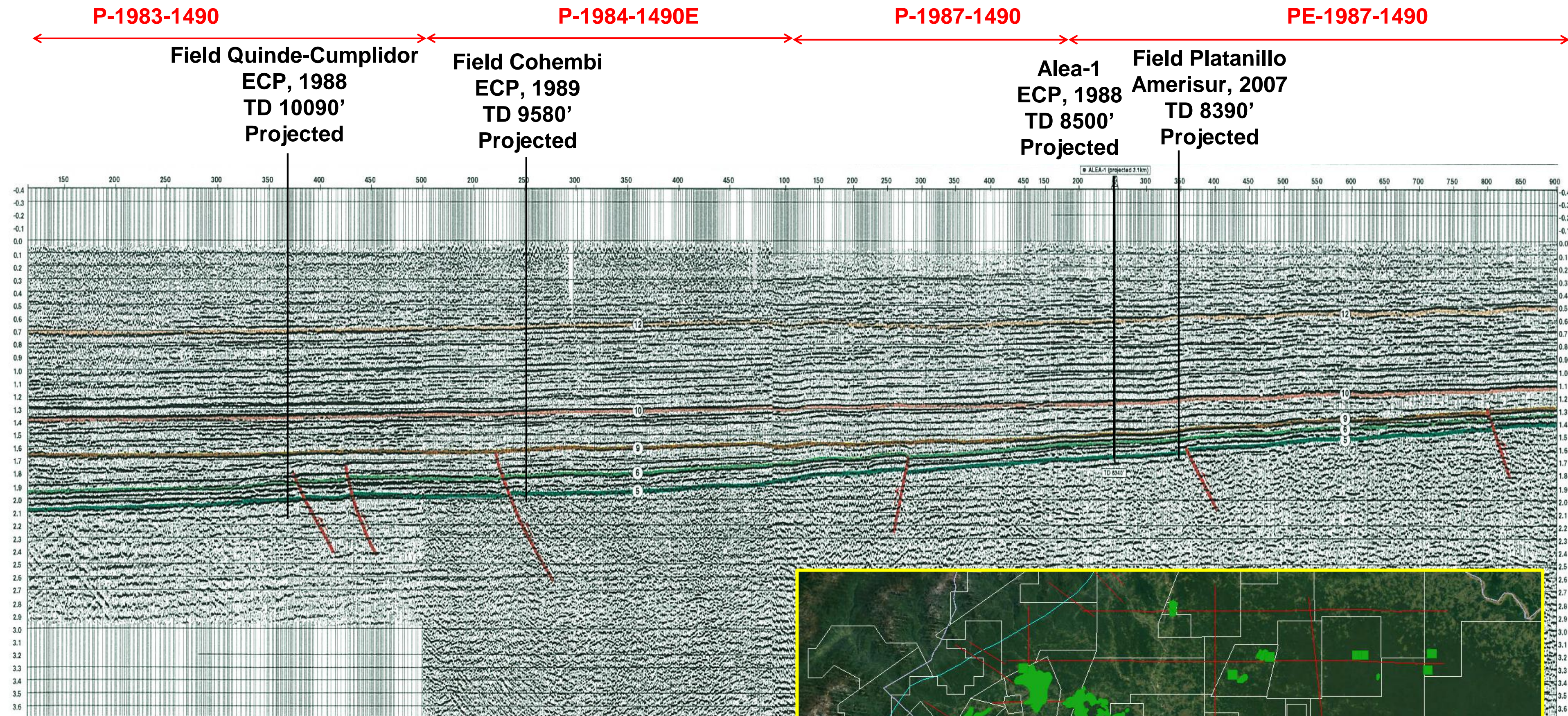
Putumayo Basin - Regional Seismic Line W-E

PW-1989-1492, PW-1988-1492, PD-1987-1492W,
P-1984-1490W, P-1983-1490



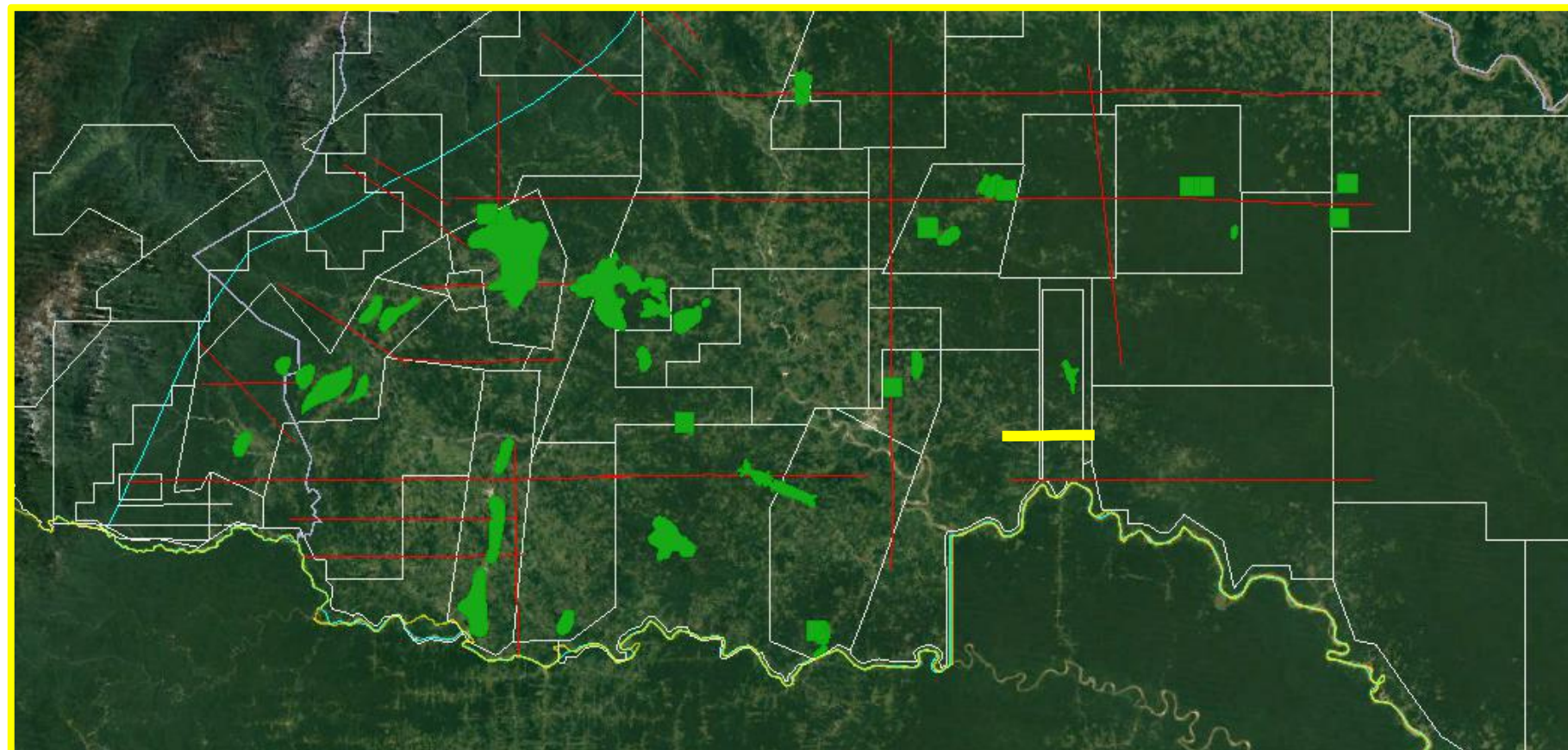
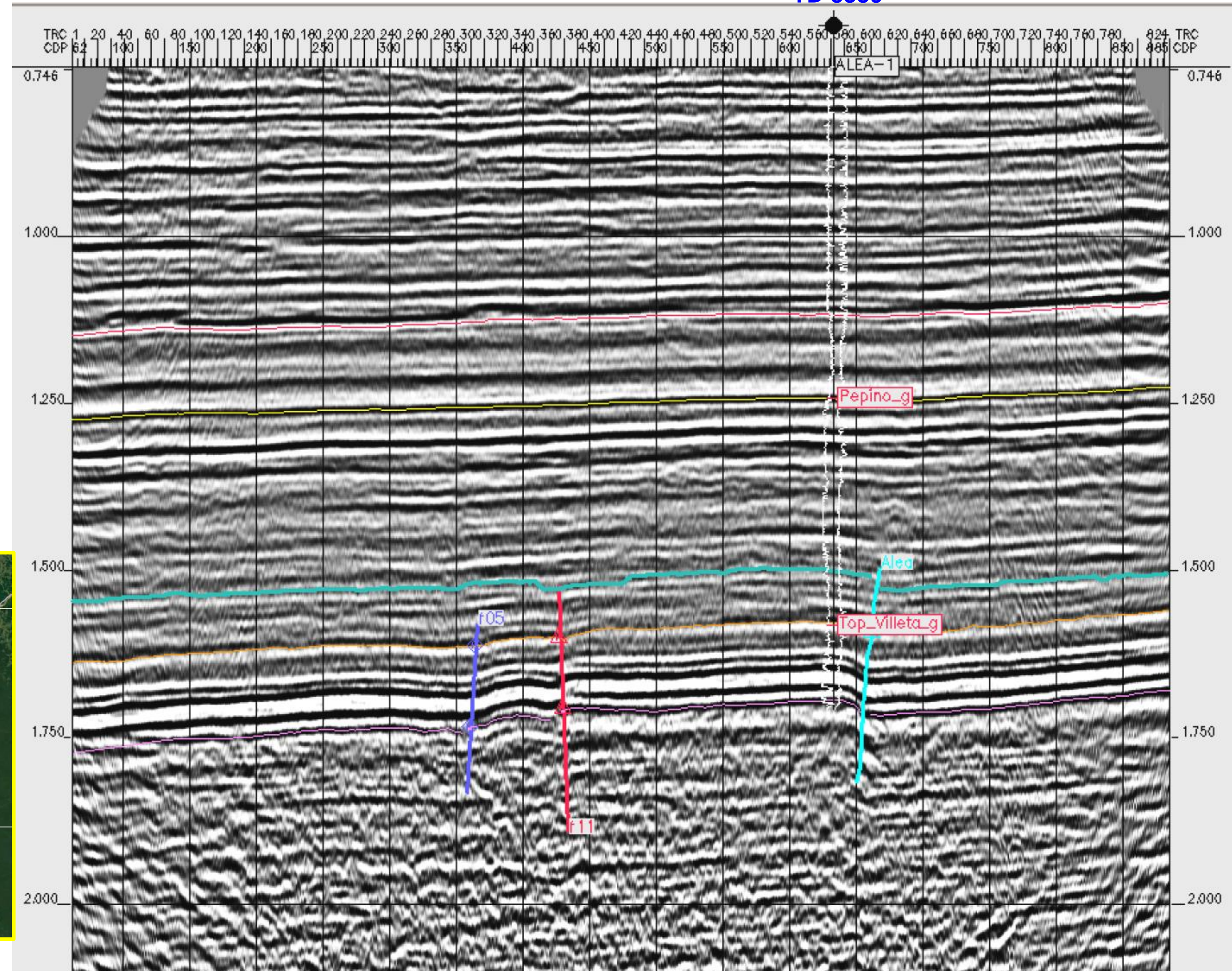
Putumayo Basin – Regional Seismic Line W-E

P-1983-1490, P-1984-1490E, P-1987-1490, PE-1987-1490



Putumayo Basin – Alea Area Seismic Line P-1992-1630

Alea-1
ECP (1988)
TD 8339'





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Eastern Zone

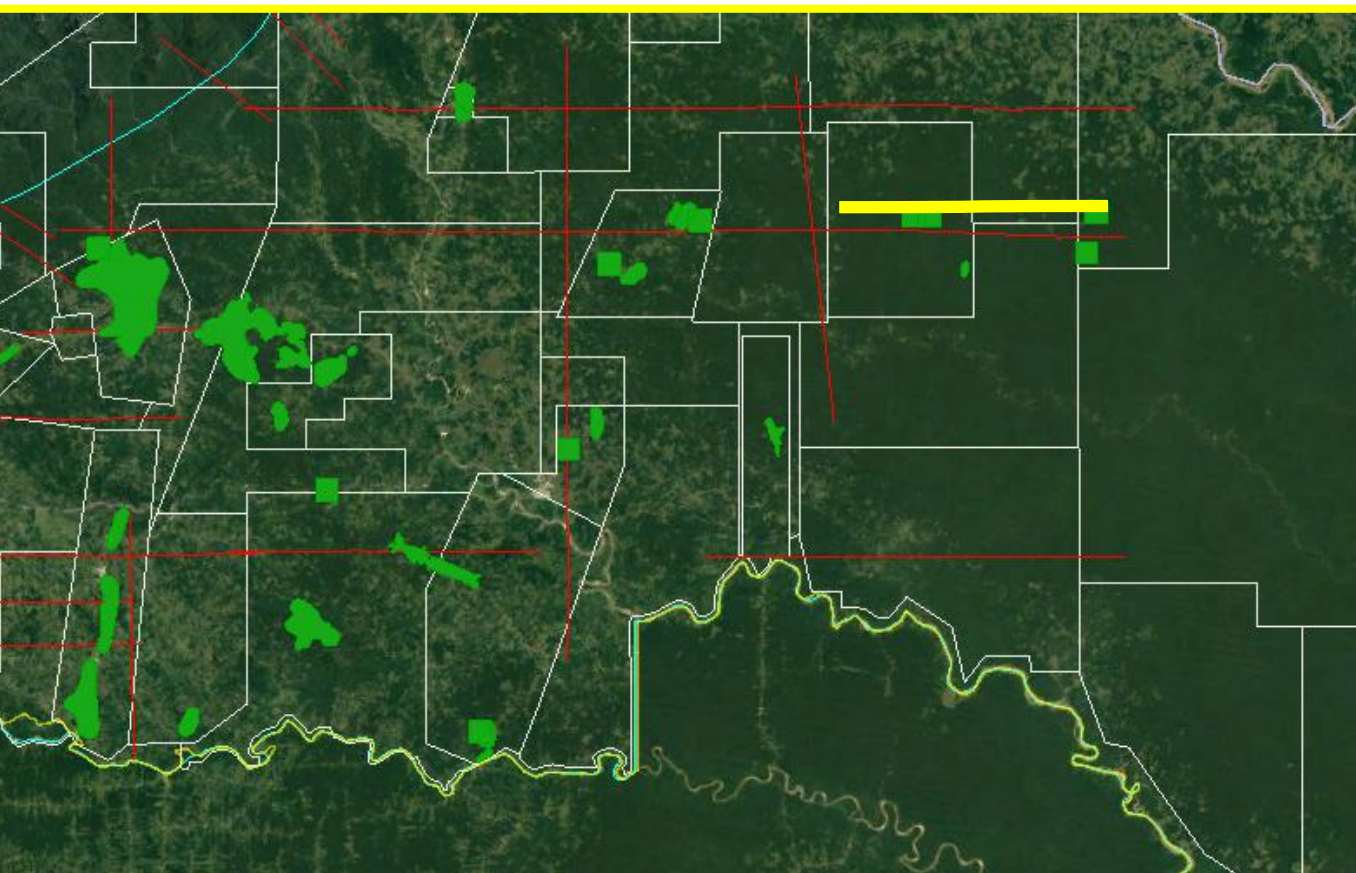
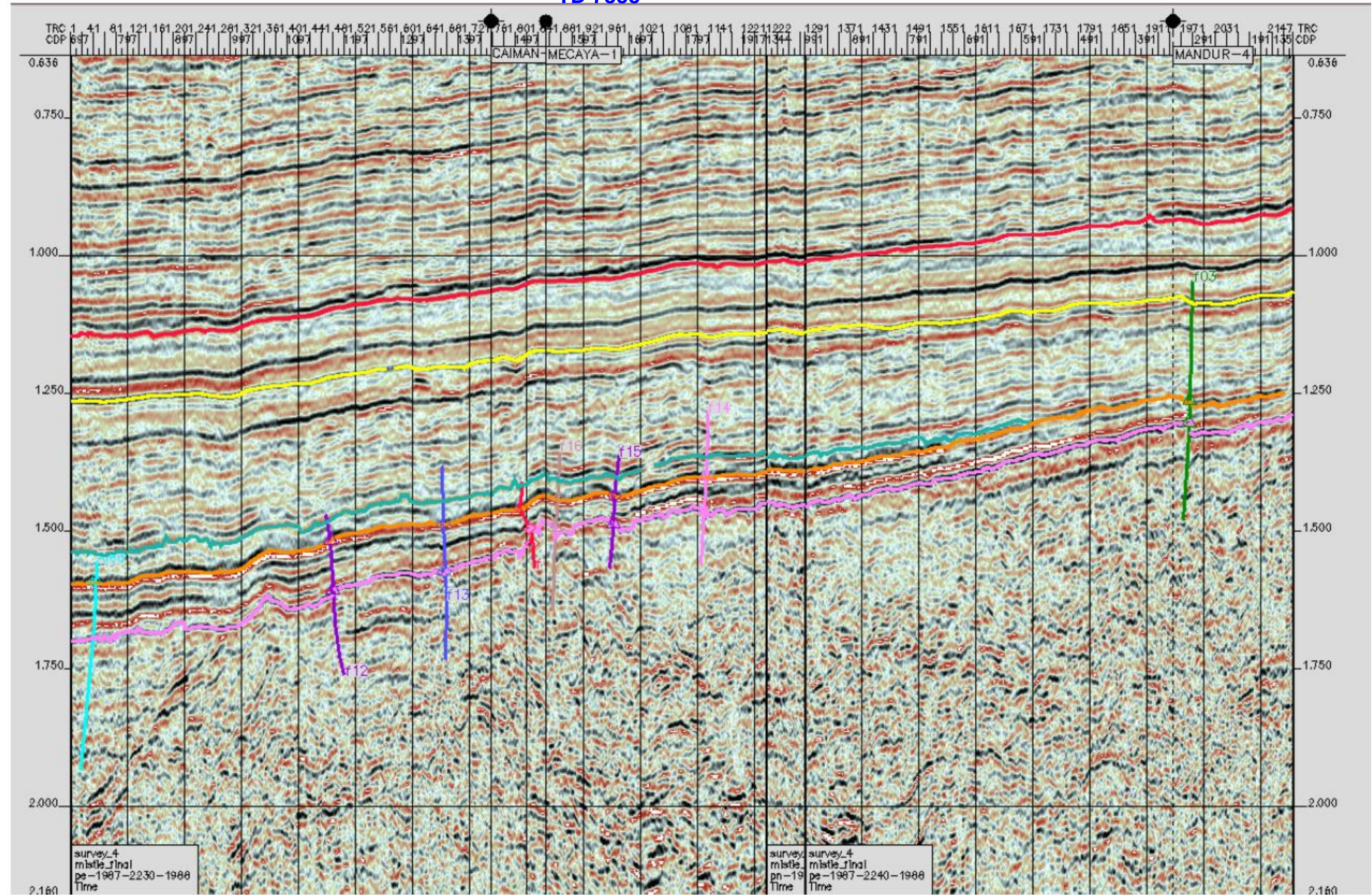


From Caiman to Solita-1

Caiman-1
Texas (1966)
TD 7732'

Mecaya-1
ECP (1989)
TD 7355'

Mandur-4
Texas (1967)
TD 6197'

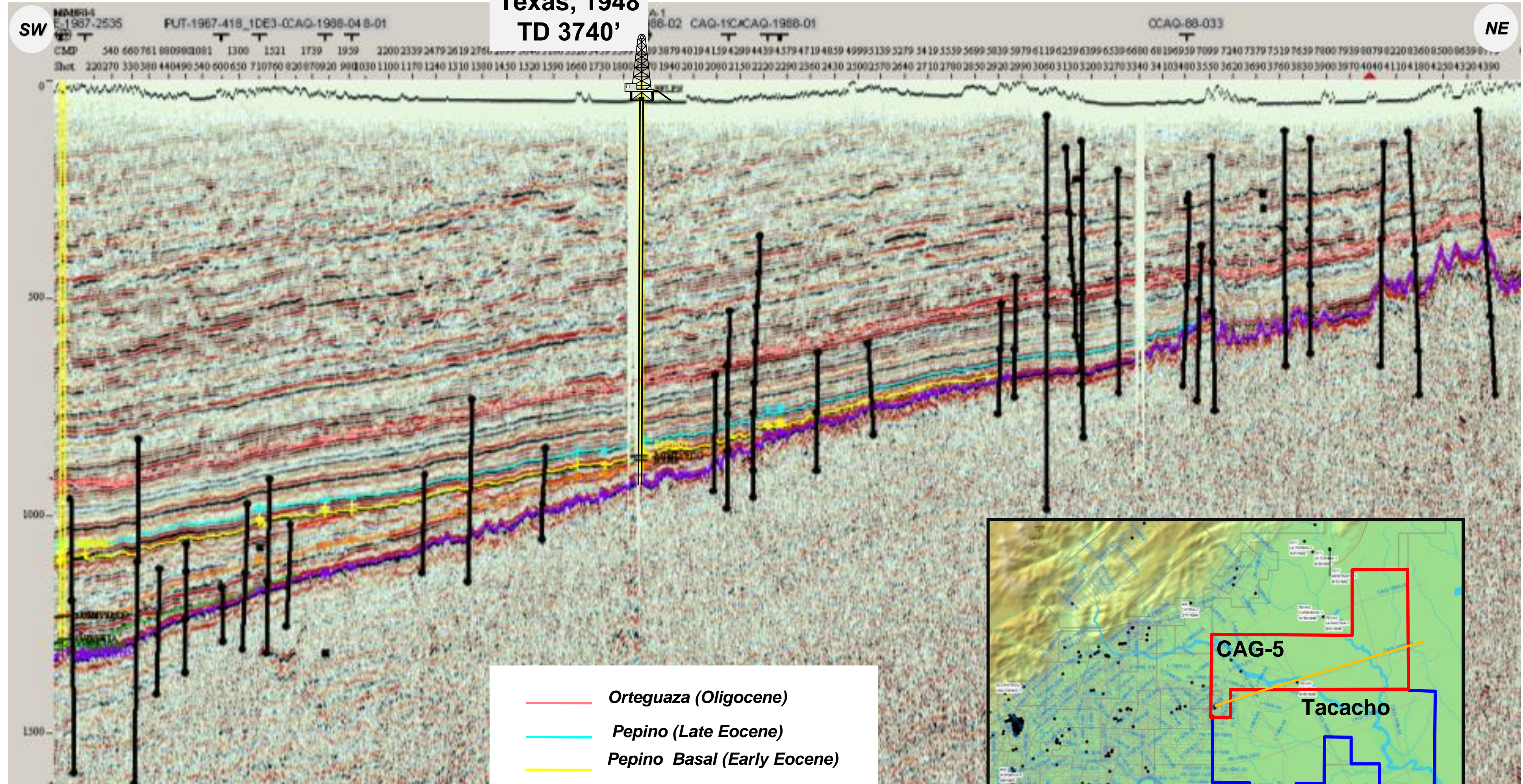


Putumayo Basin – Tacacho & CAG-5 Area

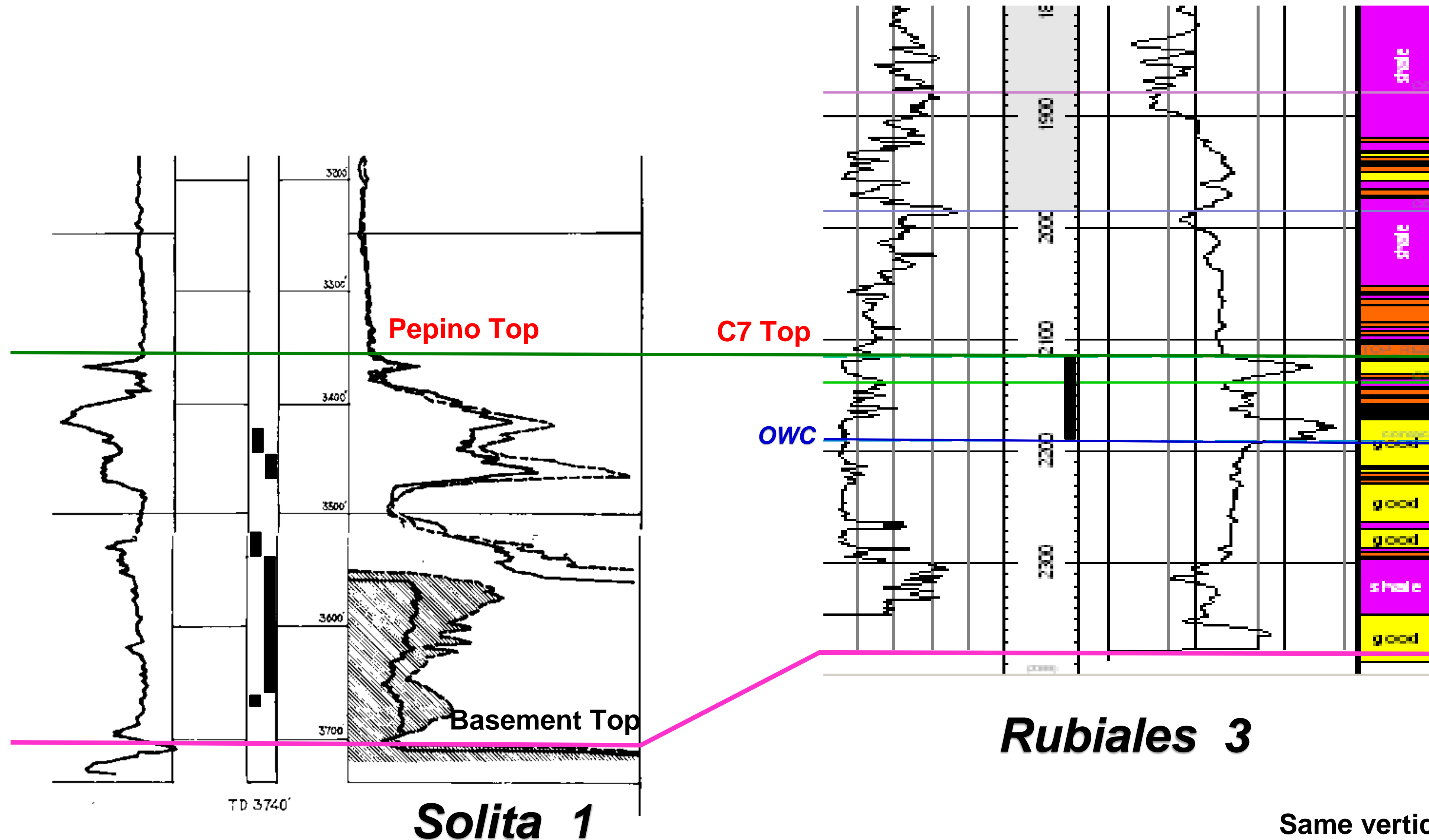
Seismic Line W-E CAQ-88-01

Mandur-4
Texas (1967)
TD 6197'

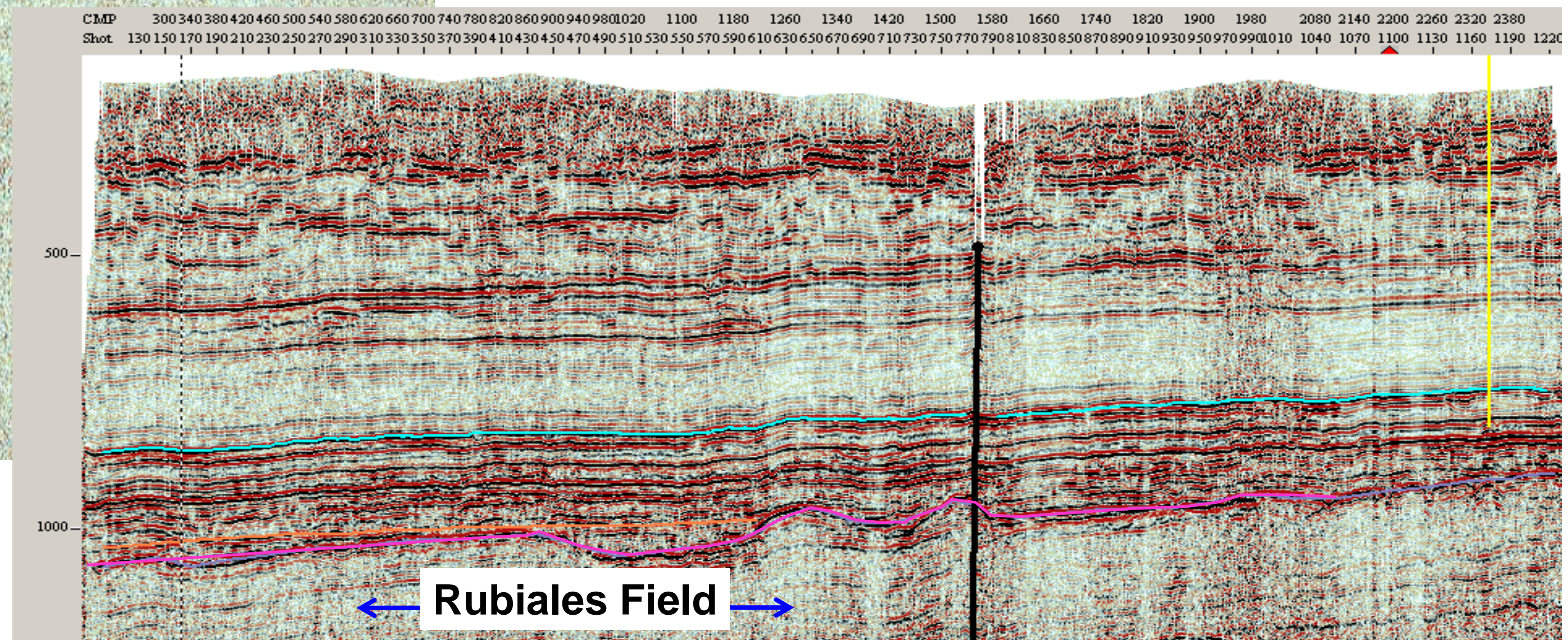
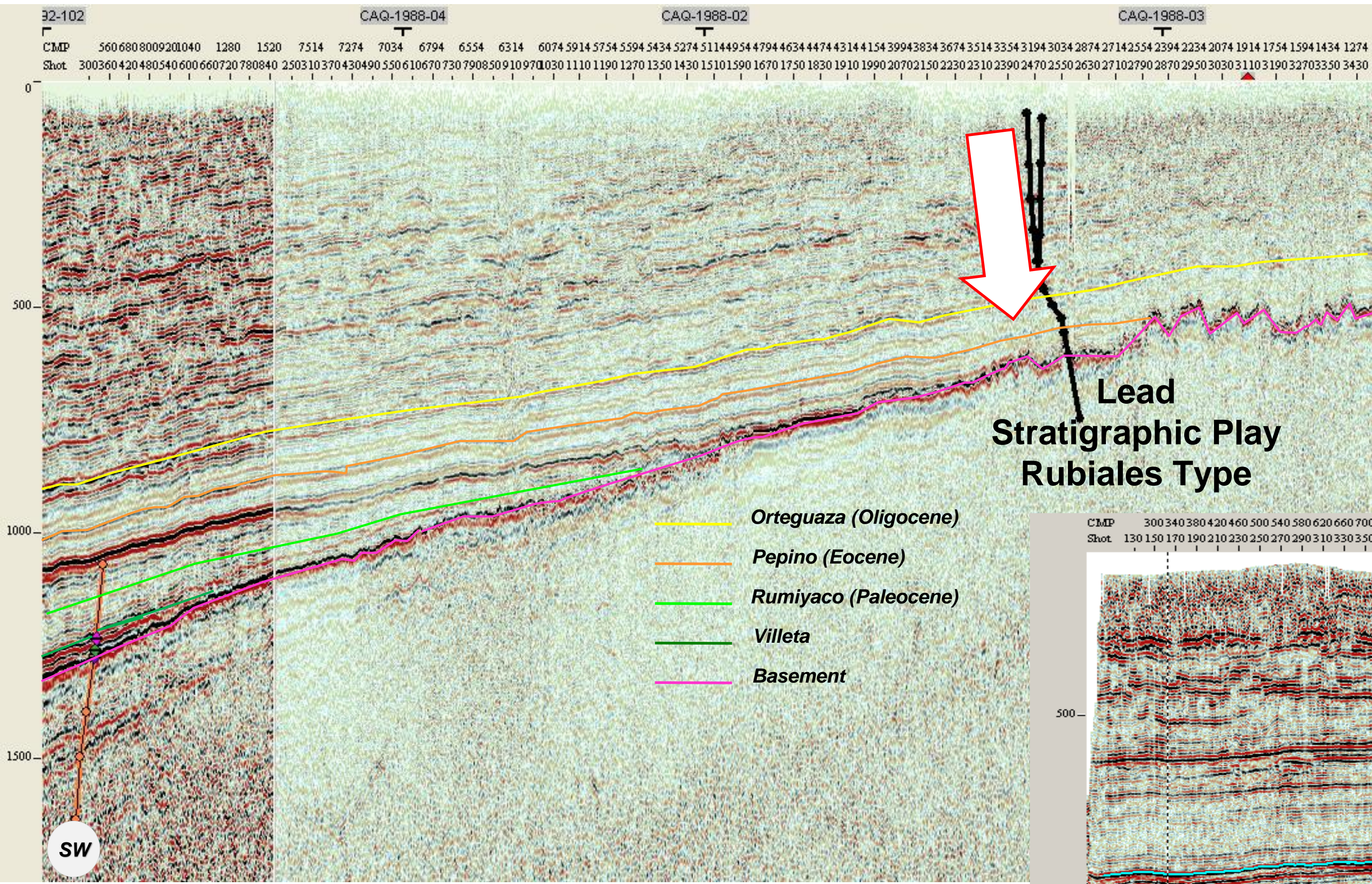
Solita 1
Texas, 1948
TD 3740'

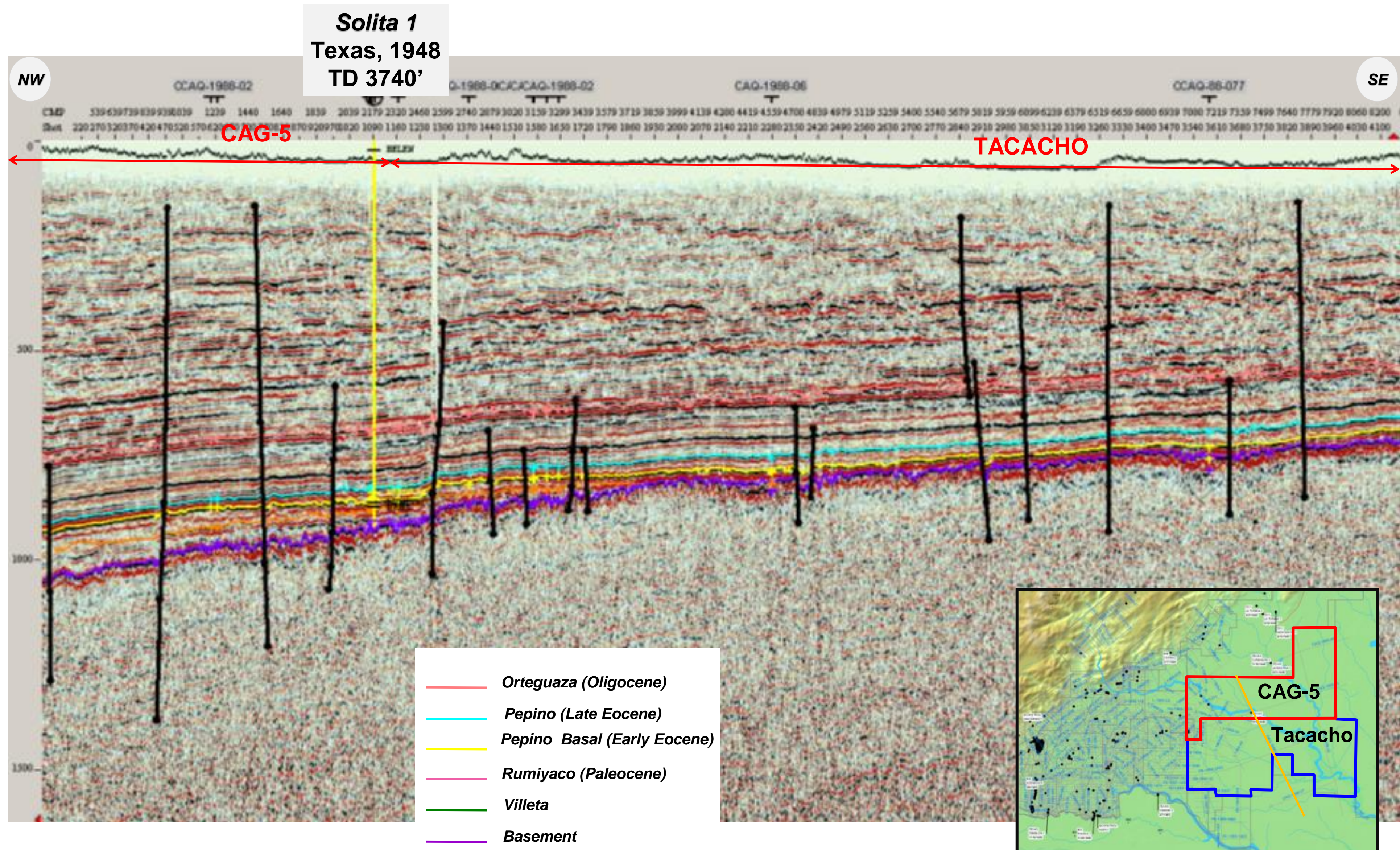


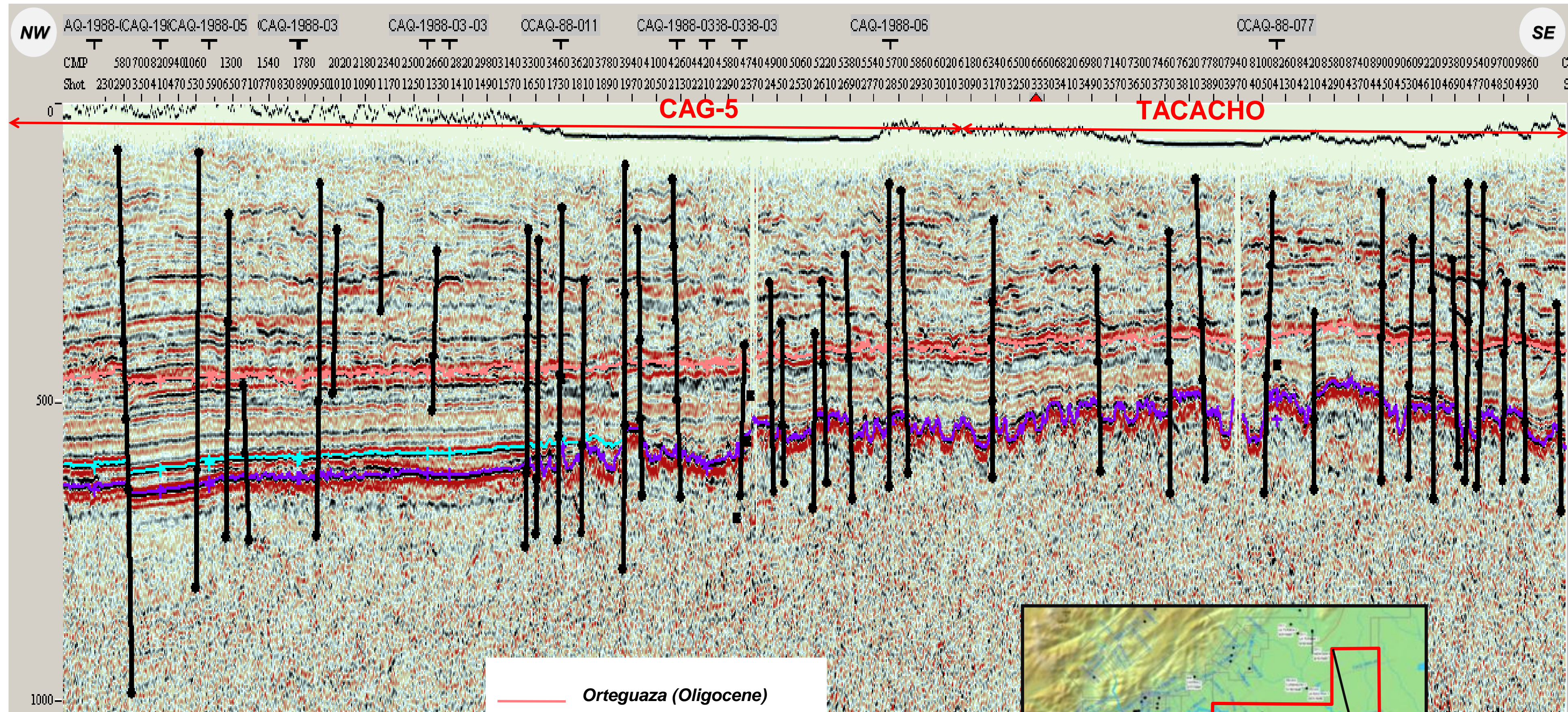
Stratigraphic Correlation between Solita-1 & Rubiales-3 Wells (Basal Sands Top as datum)



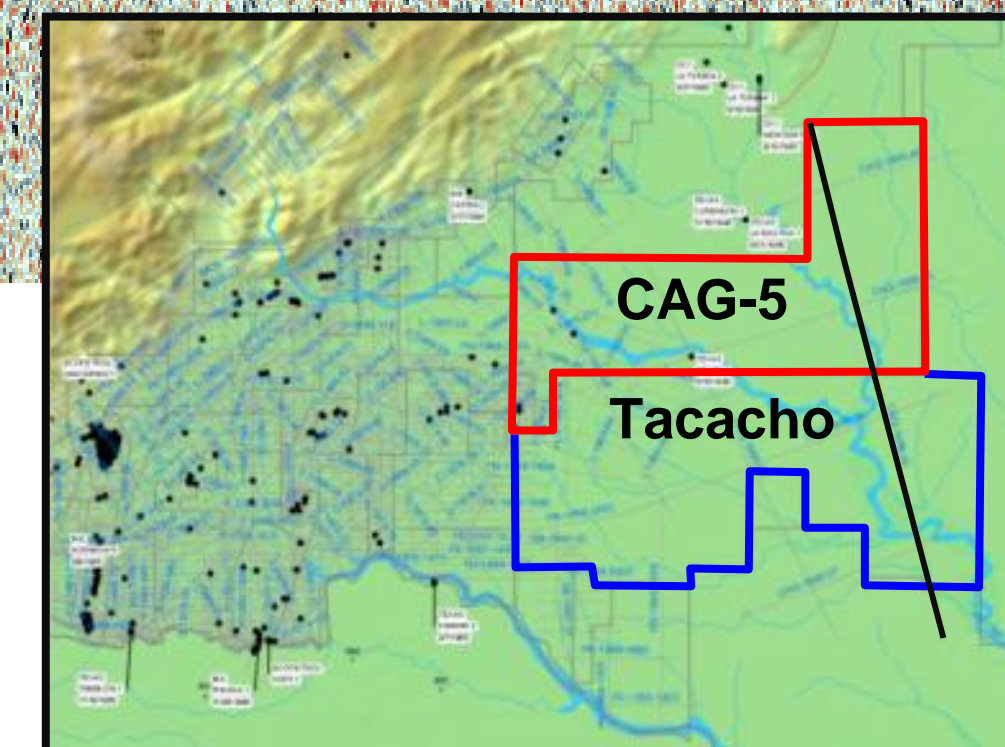
Comparison between Tacacho & Rubiales Seismic Geometry





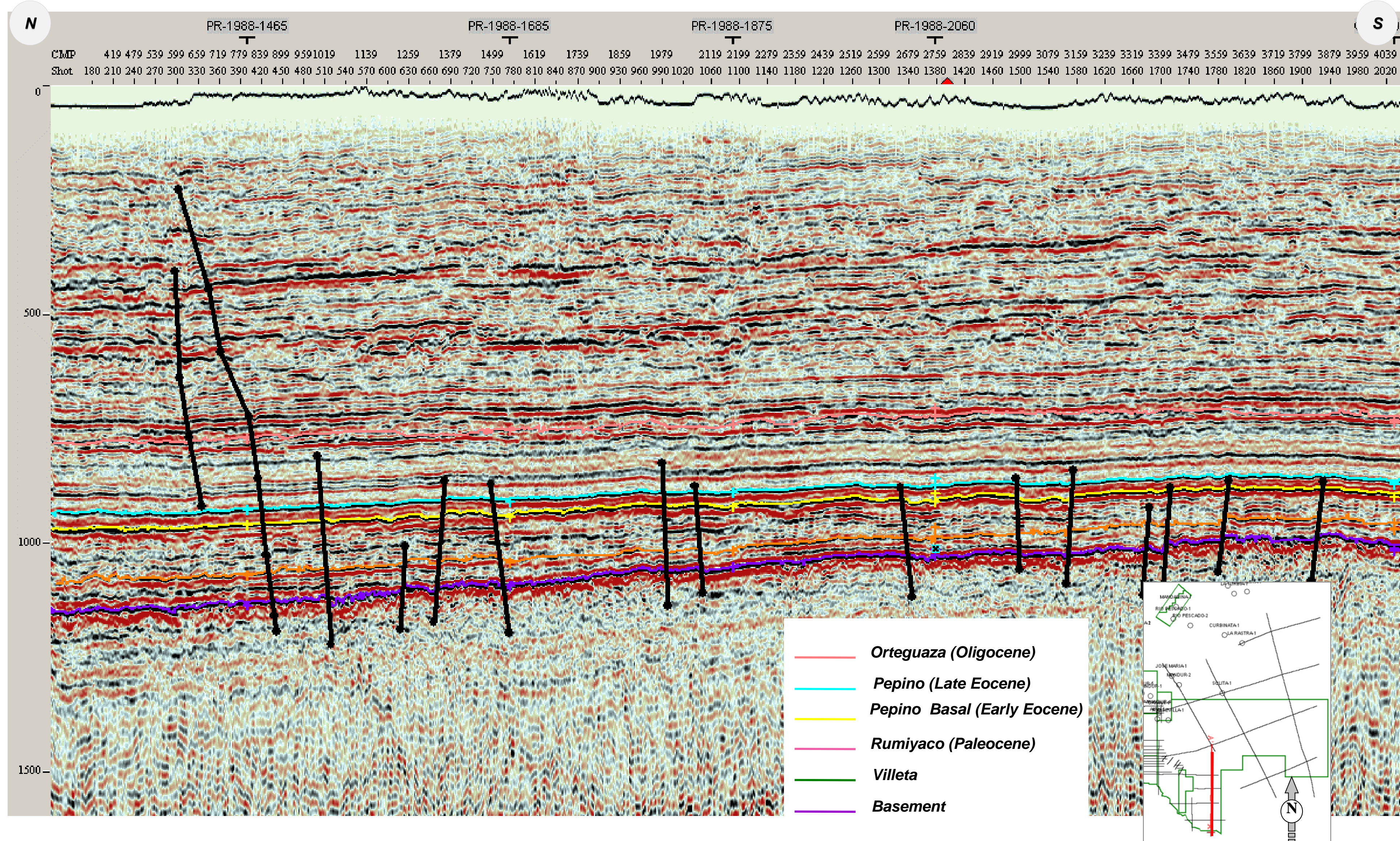


- Orteguzaza (Oligocene)
- Pepino (Late Eocene)
- Pepino Basal (Early Eocene)
- Rumiycaco (Paleocene)
- Villeta
- Basement



Putumayo Basin – Tacacho Sur Area

N-S Seismic Line PR-1988-1330 STRIKE



Thanks

www.anh.gov.co

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