

# COLOMBIA ROUND 2021

# EXPLORATORY OPPORTUNITIES OF THE URABA OFFSHORE

Location

Database

Infrastructure

History of Exploration

Geological Framework

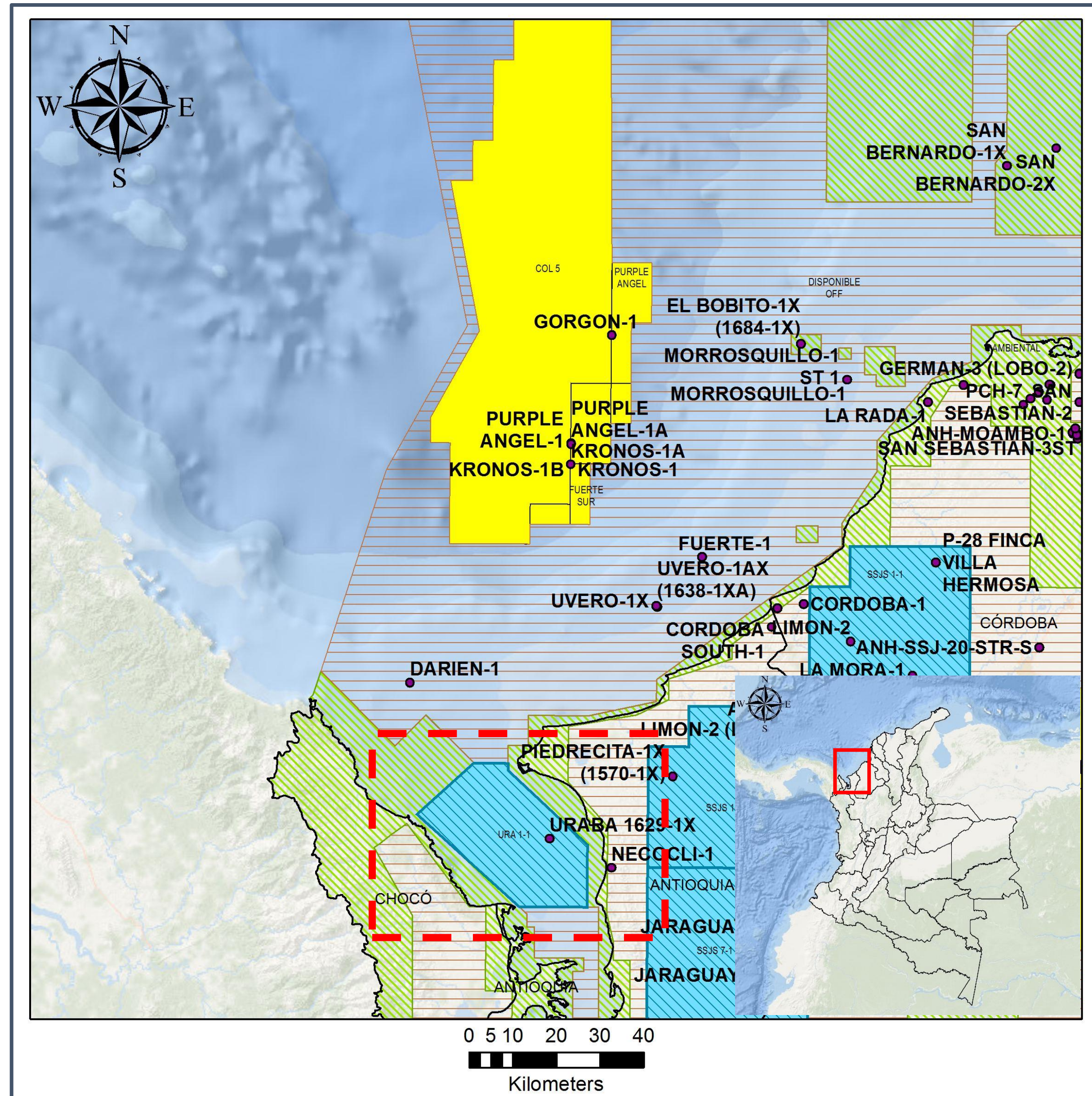
Well Data

DHI & Gas Chimney Structures

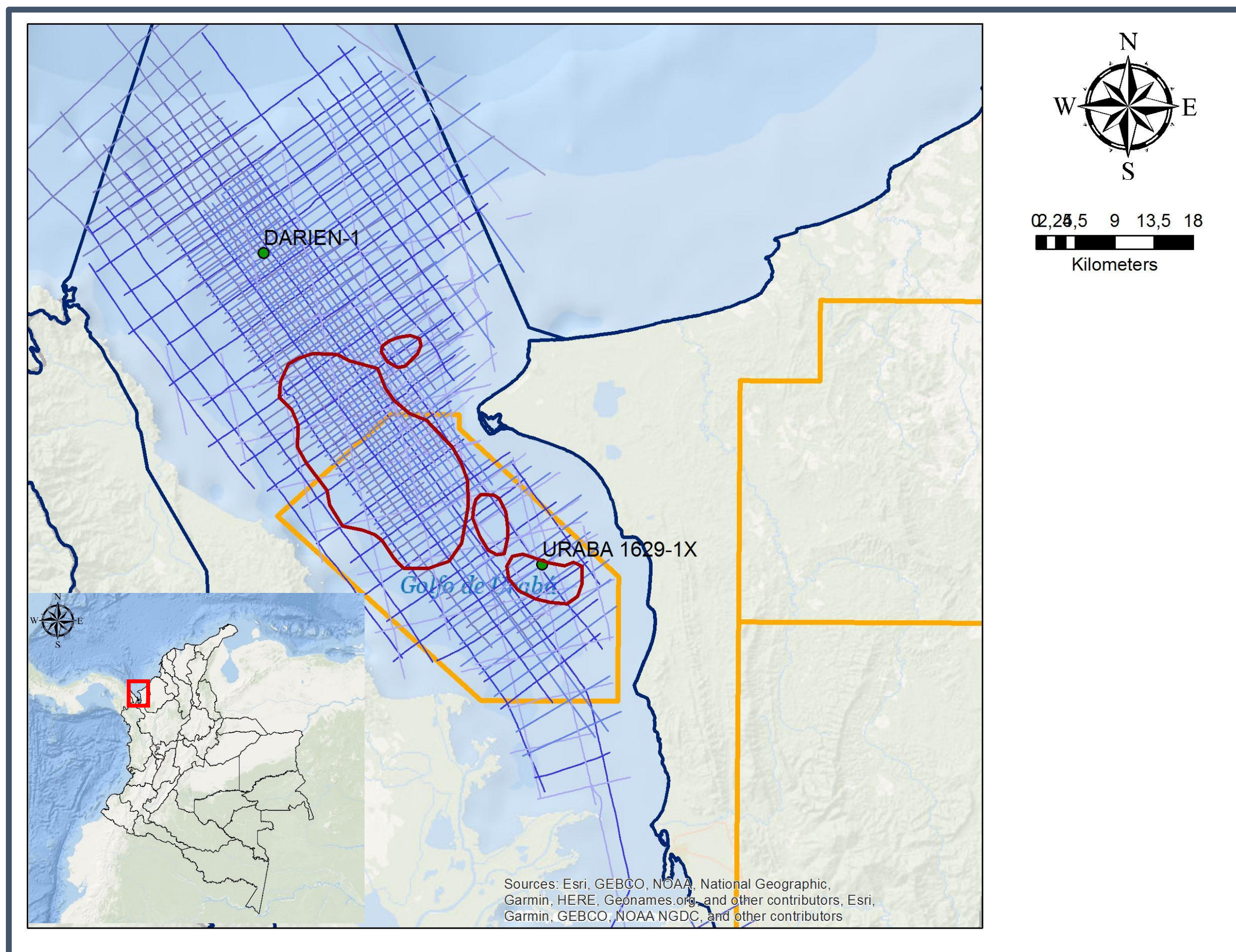
Seismic Interpretation & Volumetrics

Conclusions

# Location



- **URA 1-1 Block**
- Area: 77,543.24 Ha
- **Area Type:** Offshore
- Located in the Urabá Gulf nearby to Chocó and Antioquia departments onshore
- At the north are located the E&P contracts: **COL 5, Purple Angel & Fuerte Sur** (c.a. 50 Km apart)



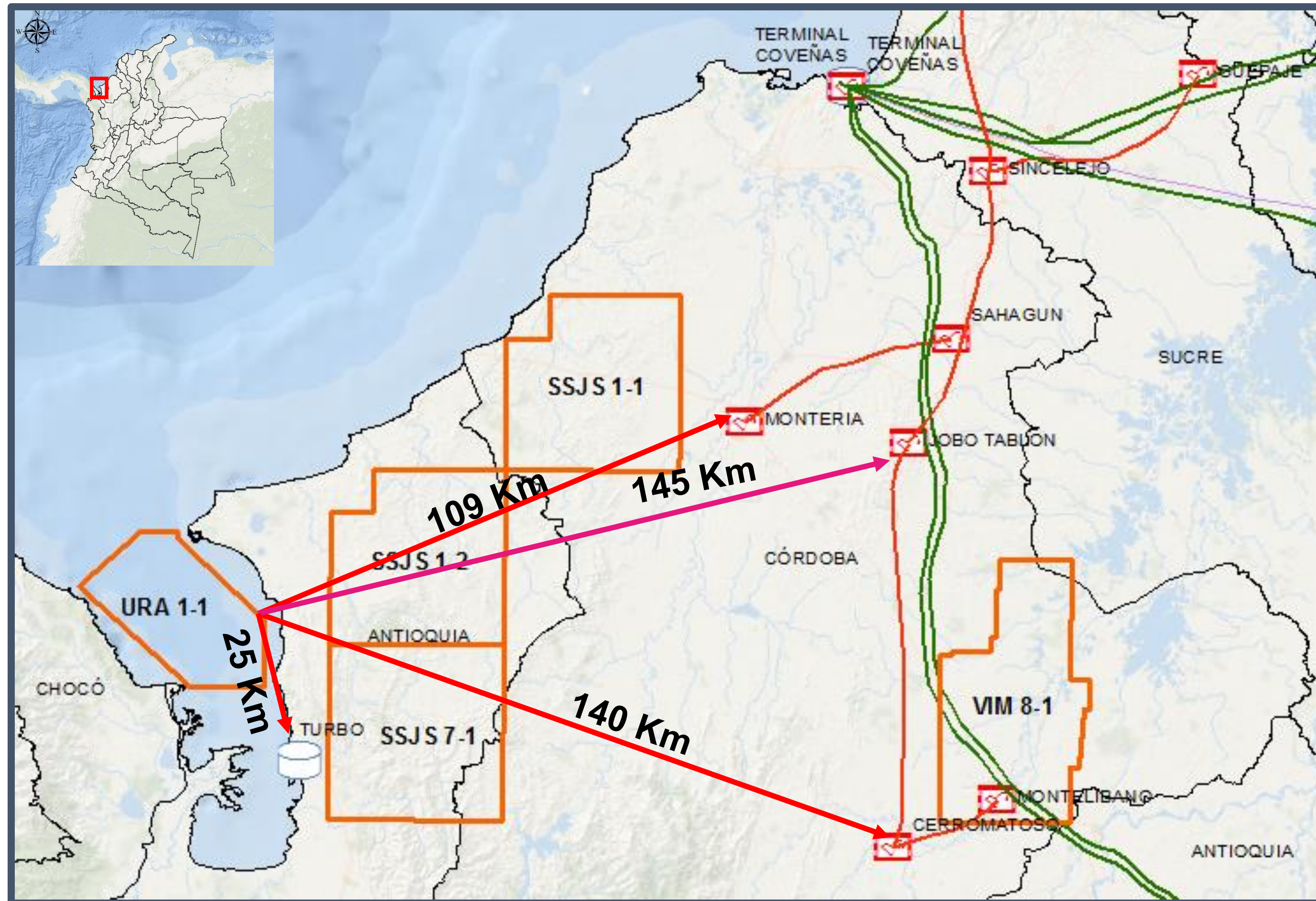
## 2D Seismic Programs (4 Surveys)

- Uraba – 67
- Golfo de Uraba – 77
- Golfo de Uraba – 78
- Golfo de Uraba – 89
- **Total Length (1,381.87 Km)**

## 3D Seismic

- None

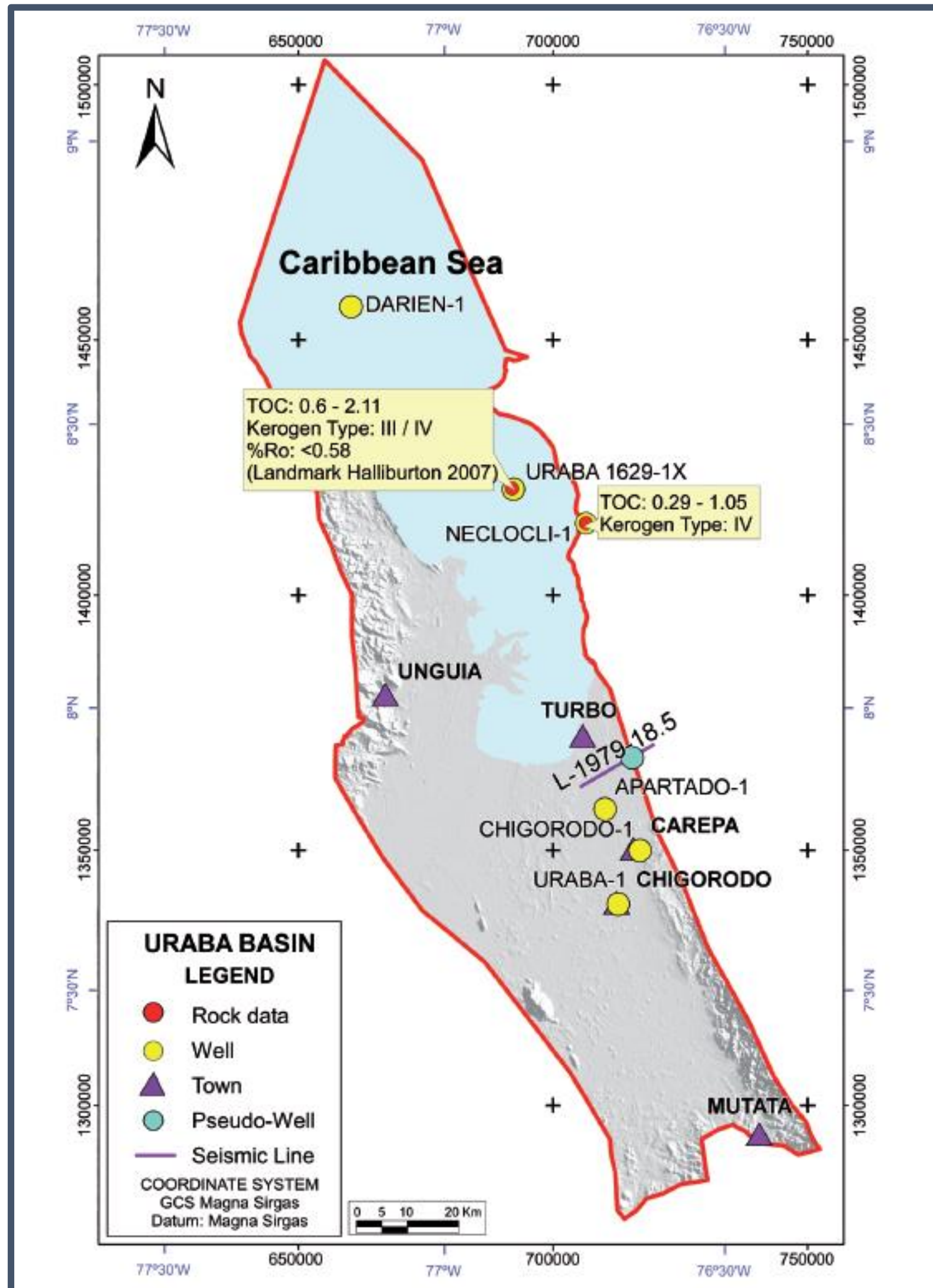
Well	Year	TD (ft)	Main Target
Uraba – 1629 – 1X	1972	11,229	Middle Miocene
Darien - 1	1979	4,425	Pleistocene (?)



## Main Infrastructure Elements Nearby:

- **Oil Pipeline:**
  - 145 Km in straight line
- **Gas Pipeline:**
  - 109 Km to Monteria Station
  - 140 Km to Cerramotoso
  - 140 Km to Jobo Tablon
- **Storage Station**
  - Turbo (20 – 30 Km)

# History of Exploration

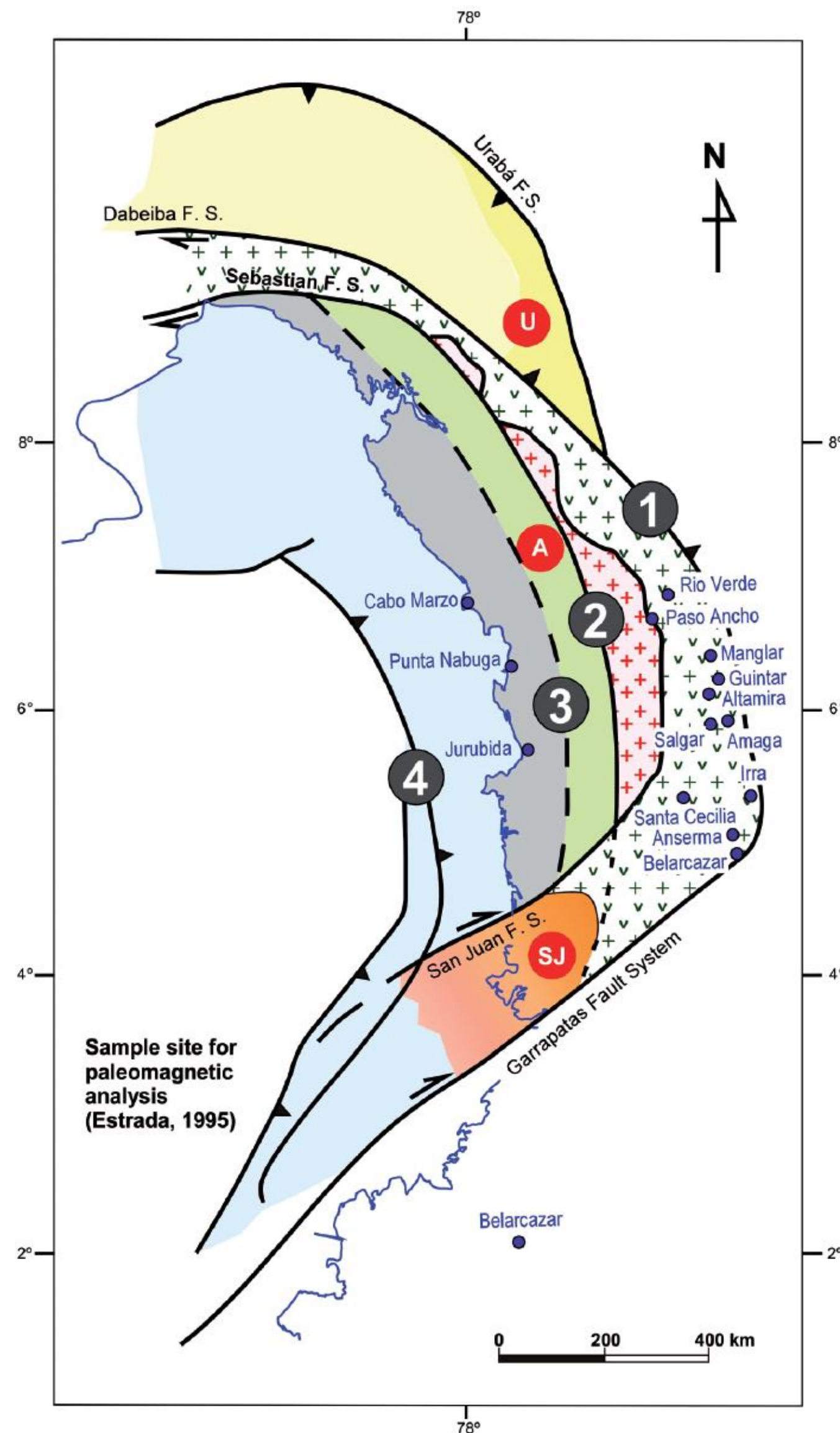


- Most of the Uraba data are the result of data generated by an early-phase of exploration taken by various petroleum and mineral companies **since the 1940's**
- Its considered a **sub-explored basin**
- Two wells drilled were drilled in the basin in the 1970s' with just one inside the area
- Area covered by **2D seismic** programs **from 1977 up to 1989**

# GEOLOGICAL FRAMEWORK



# Geological Framework



- The **basement** of the Uraba basin is comprised of **allochthonous fragments** of Late Cretaceous oceanic crust and or island arcs
- Urabá (**Pull-apart**) Basin: Up to 4 km of **marine deltaic sediments** deposited since Miocene (?)
- Deposition in a transtensional regime marked by the influence of **transcurrent faults**
- There are some **rocks with generating characteristics** in the Urabá 1629-1X and Darien – 1 wells on rocks with calcareous and clayey facies from Miocene (?)
- The **Pliocene sequence** located in the Darien – 1 well **shows favourable characteristics for hydrocarbon accumulation.**
- Landmark – Halliburton (2007) reported **coralline limestone** from seismic amplitude anomalies

# Stratigraphic Setting

AGE	HORIZONS	STRATIGRAPHIC UNITS			
		URABA	CINTURON PLEGADO DEL SINU	ABANICO DEL MAGDALENA	CIENAGA "PULL APART"
Holoceno		POST POPA	POST POPA		
Pleistoceno	EARLY PLEISTOCENE	POPA SUPERIOR	POPA SUPERIOR	ROTINET	ROTINET
				POPA SUPERIOR	
Plioceno	LATE PLIOCENE UNCONFORMITY	POPA INFERIOR	POPA INFERIOR	POPA INFERIOR	POPA INFERIOR
Mioceno	MIOCENE UNCONFORMITY	PERDICES	PERDICES	TUBARA	TUBARA
	MIDDLE MIOCENE	HIBACHARO	HIBACHARO	HIBACHARO	HIBACHARO
	OLIGOCENE				
Oligoceno			CARMEN - PORQUERO	PORQUERO - CARMEN	PORQUERO - CARMEN
Eoceno			?	?	?
Paleoceno					
?	BASEMENT	BASAMENTO	BASAMENTO	BASAMENTO	BASAMENTO

Possible Reservoir

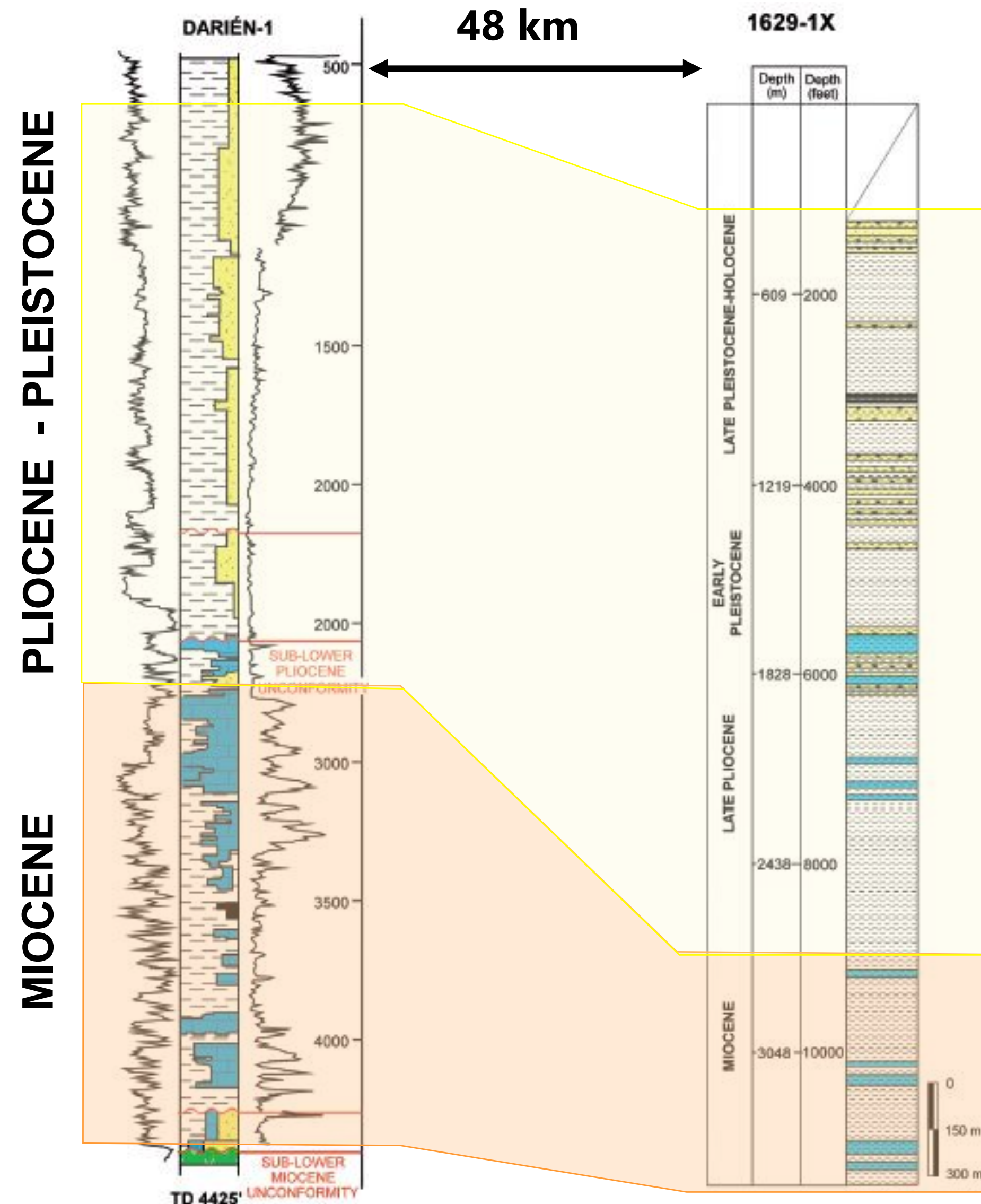
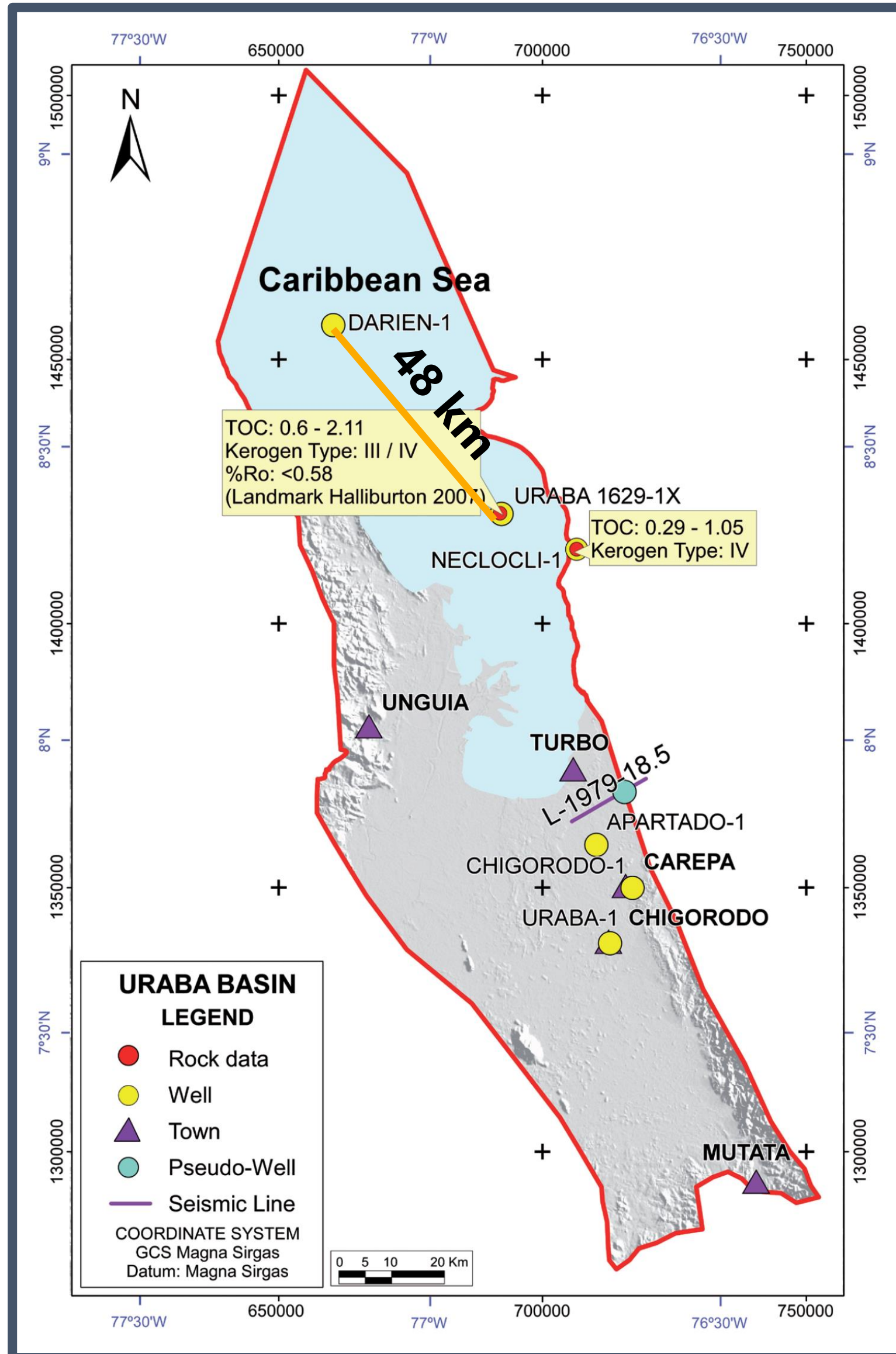


Source (?)



- The oldest recorded sedimentary rocks are **Lower Miocene**.
- Possible **reservoirs at Pliocene**

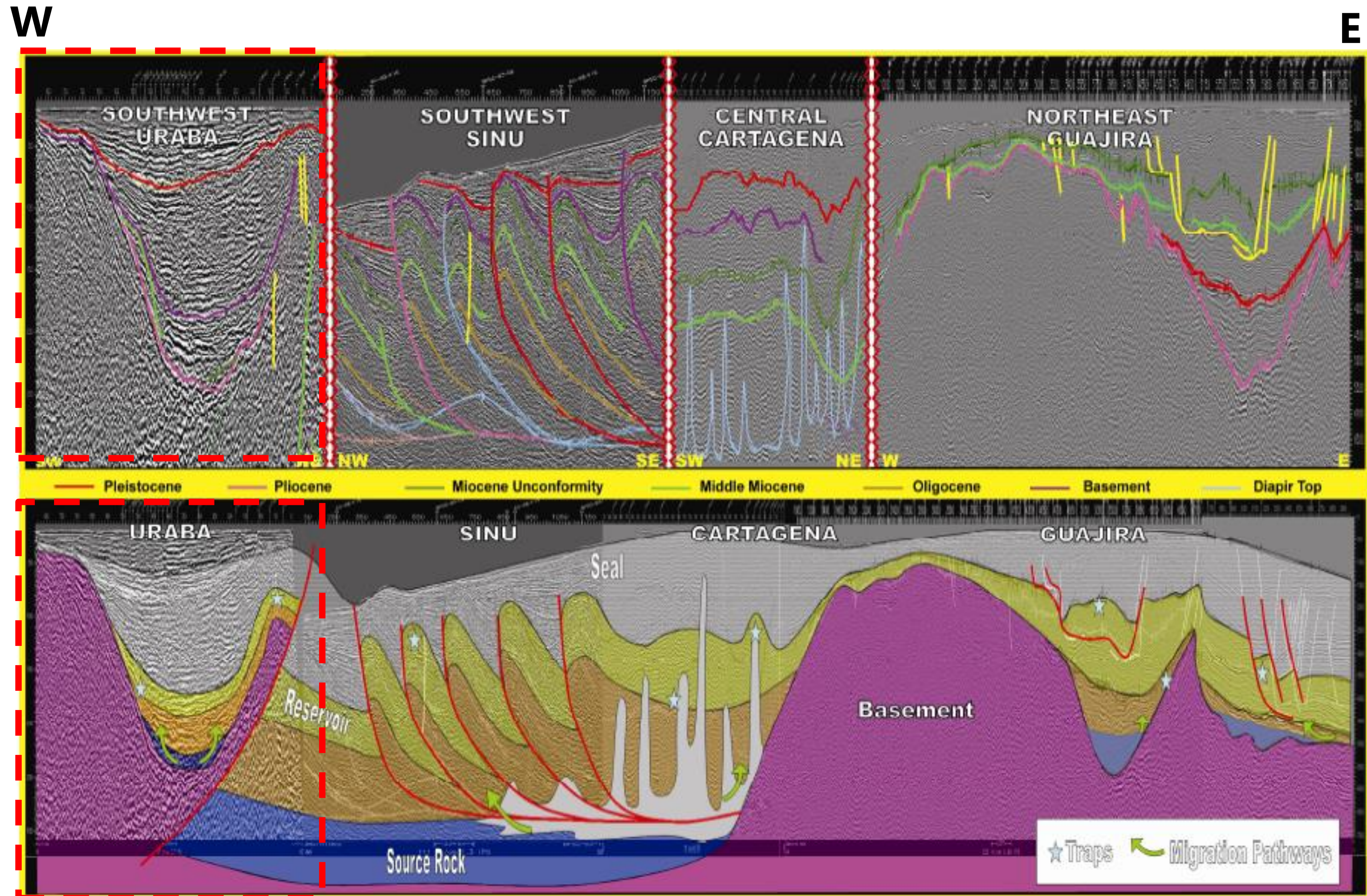
# Well Data



- Sandy layers of middle platform with shale intercalations and reef limestones

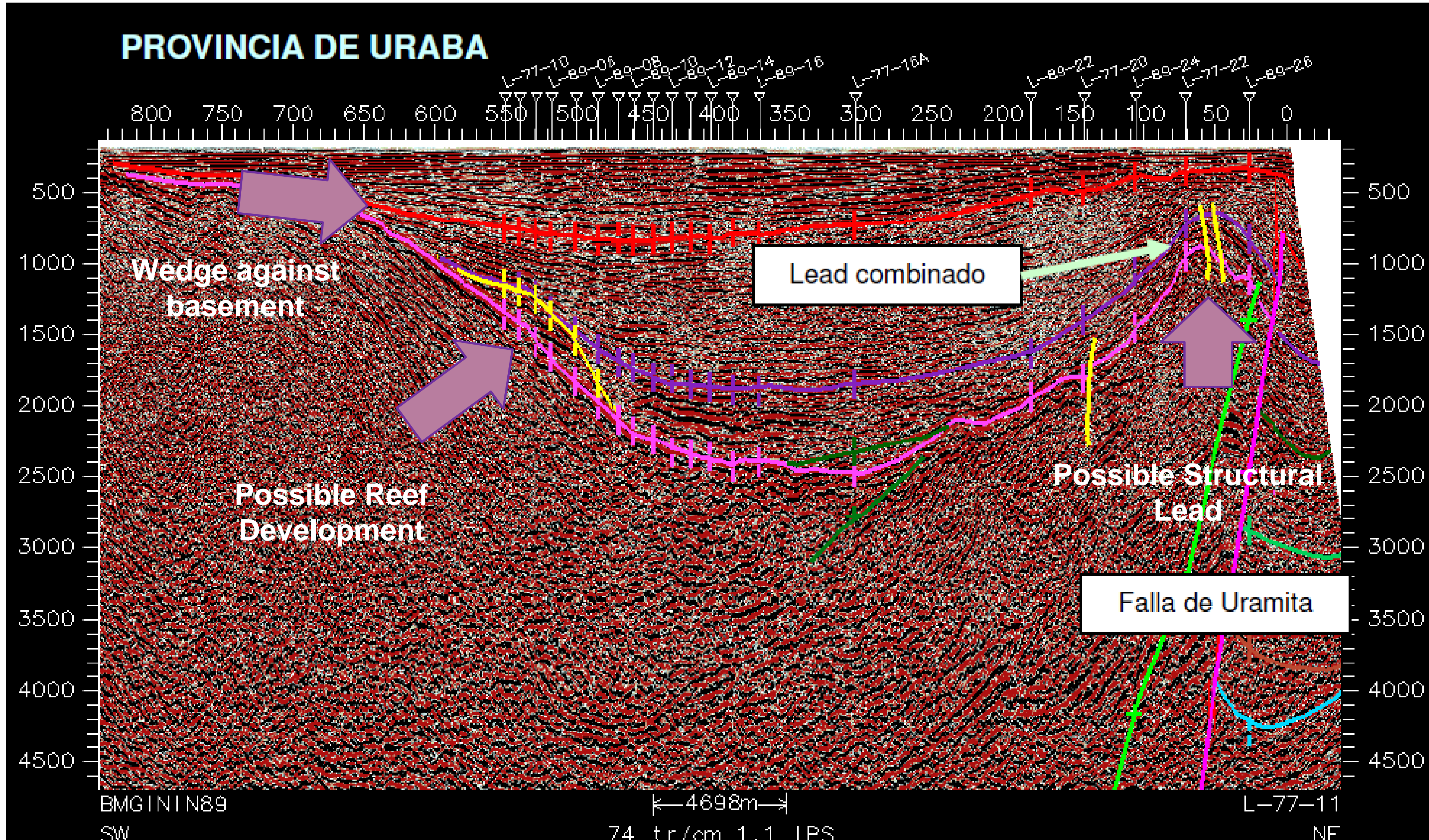
- Predominantly outer platform limestones with deep marine shales

# Geological Trend

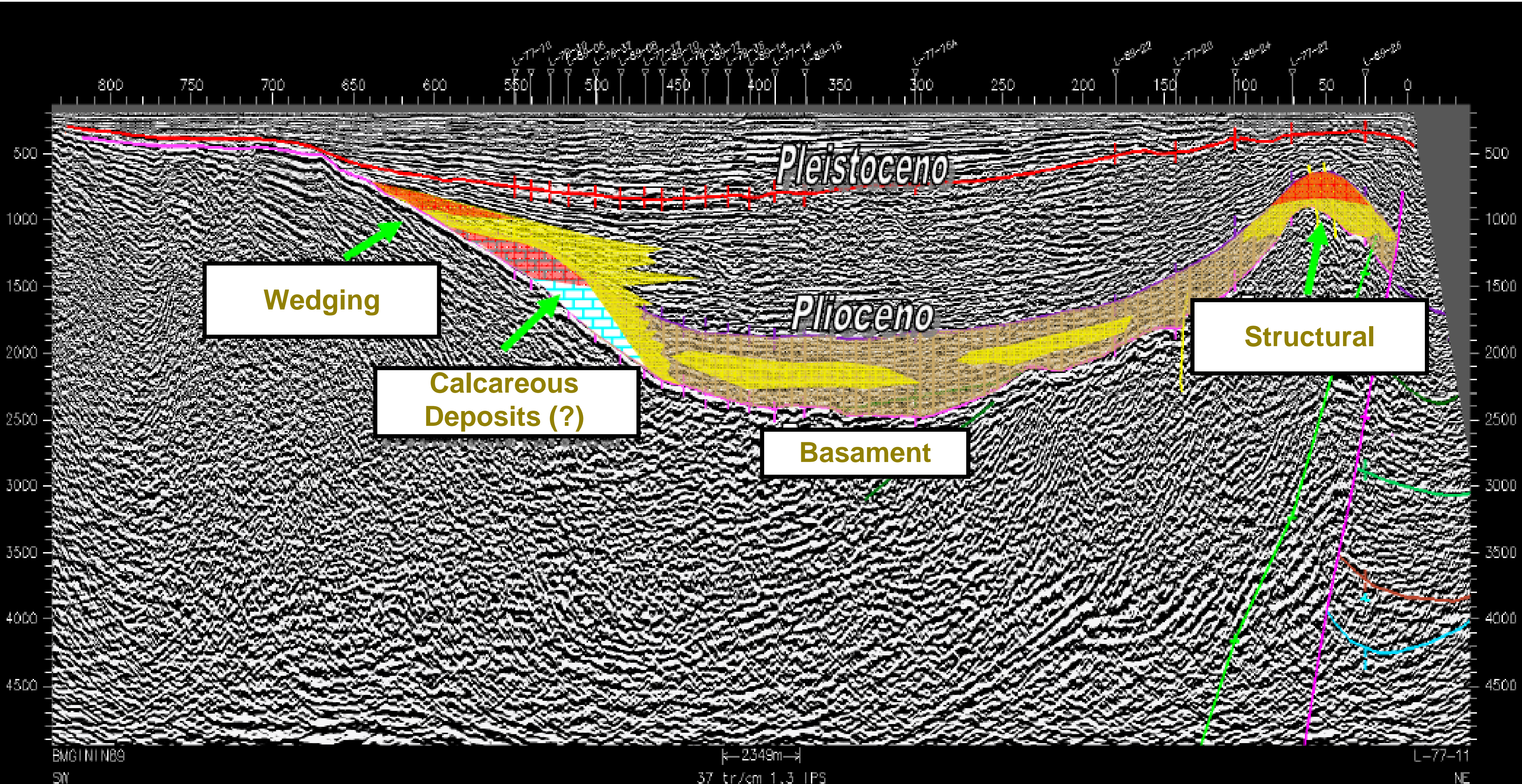


Middle Miocene to Pliocene – Pleistocene sediments controlled by transtensional faulting

# Landmark Seismic Interpretation for the ANH (2007)

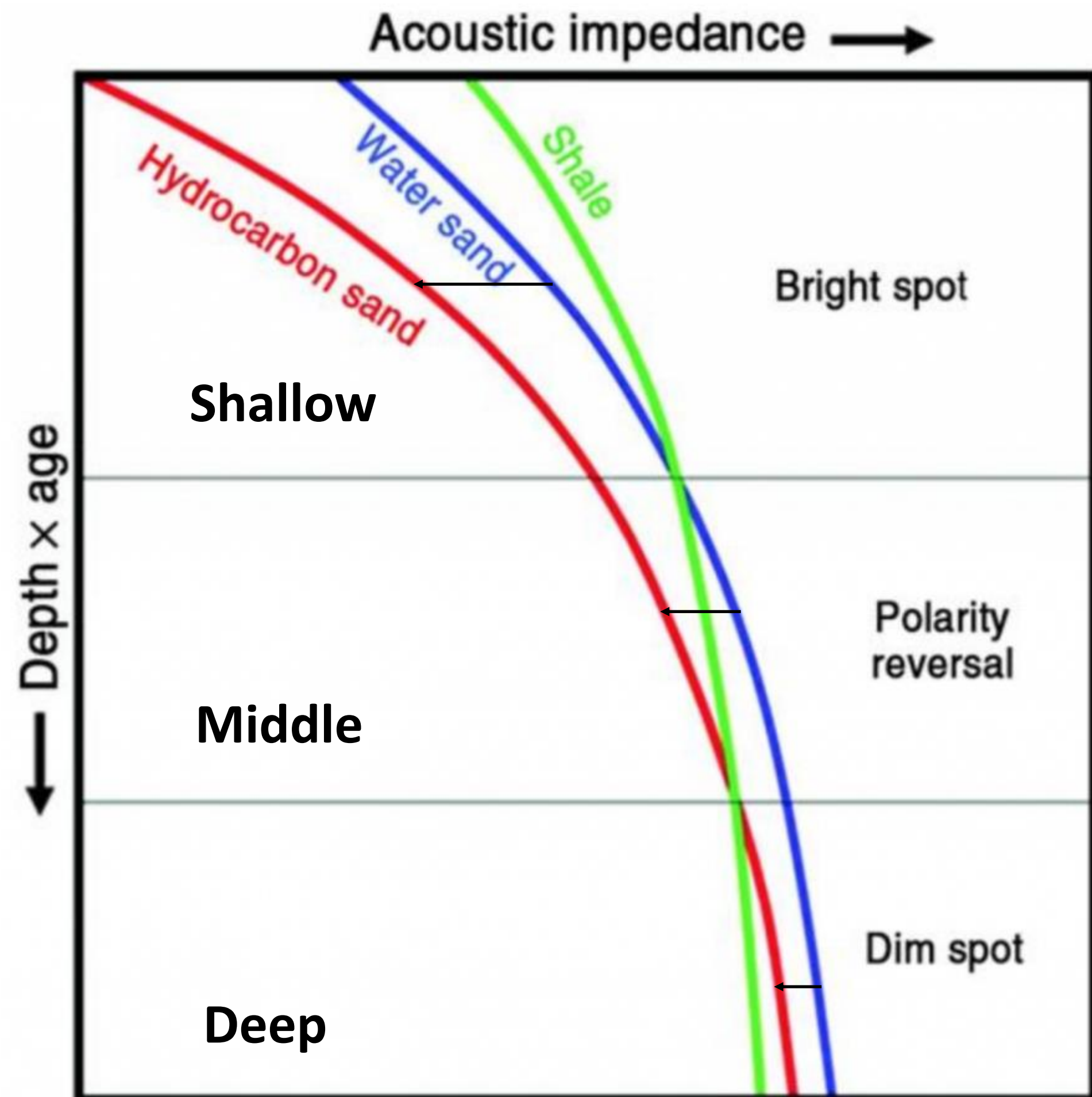


# Possible Stratigraphic Trap (Reef Limestone)



# GAS CHIMNEYS AND DHI

# Direct Hydrocarbon Indicators

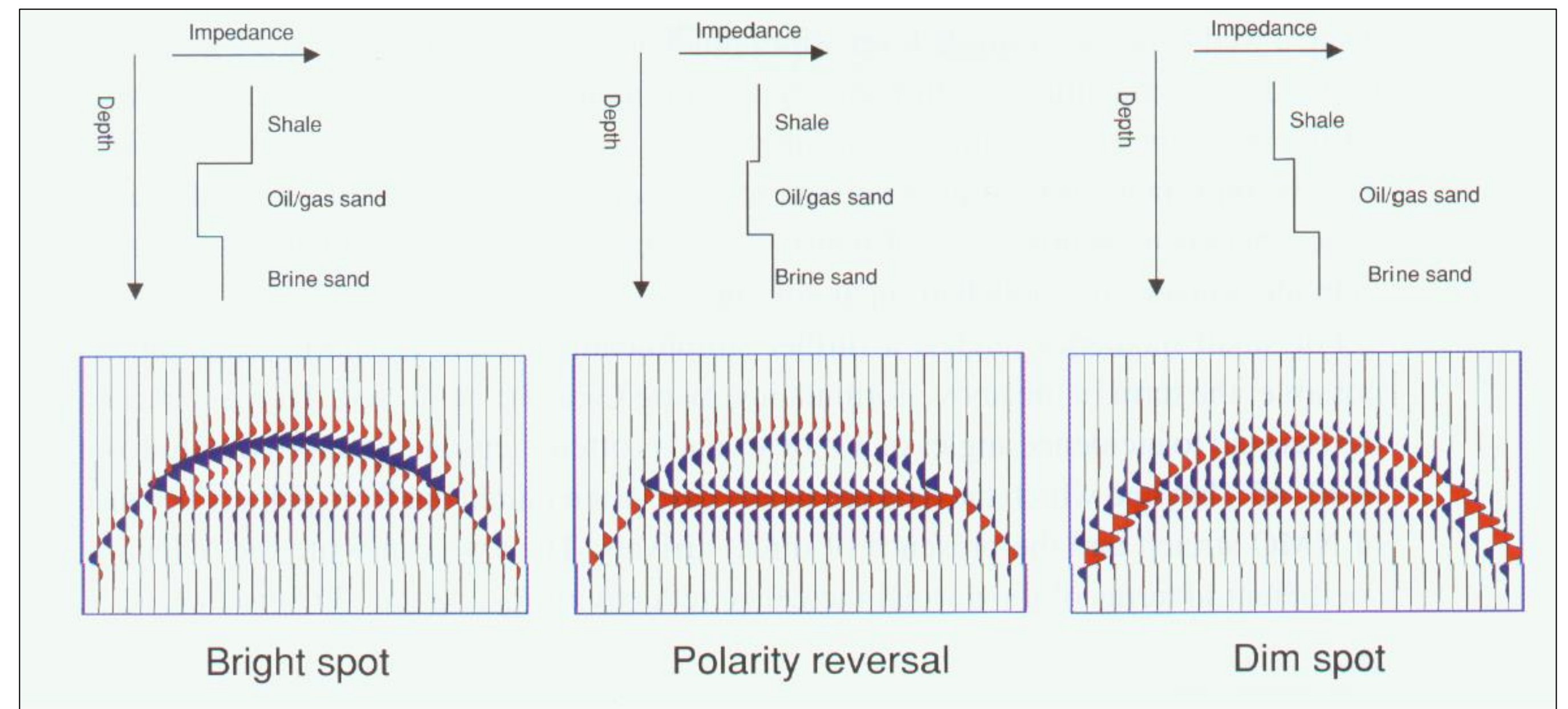


Taken from Hart (2011)

**Shallow**

**Middle**

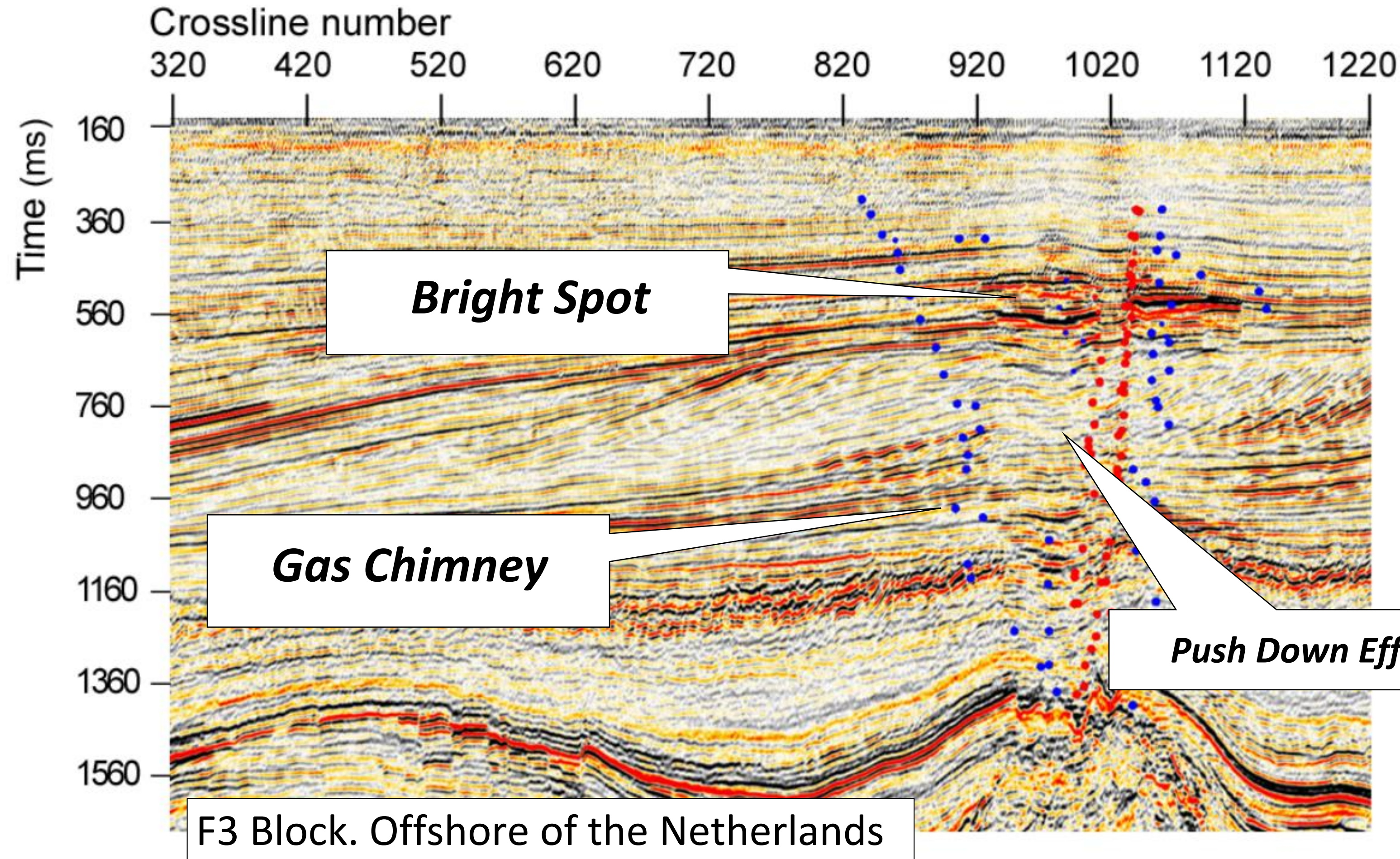
**Deep**



Taken and Modified from Simm & Bacon (2014)



# Gas Chimney Structures



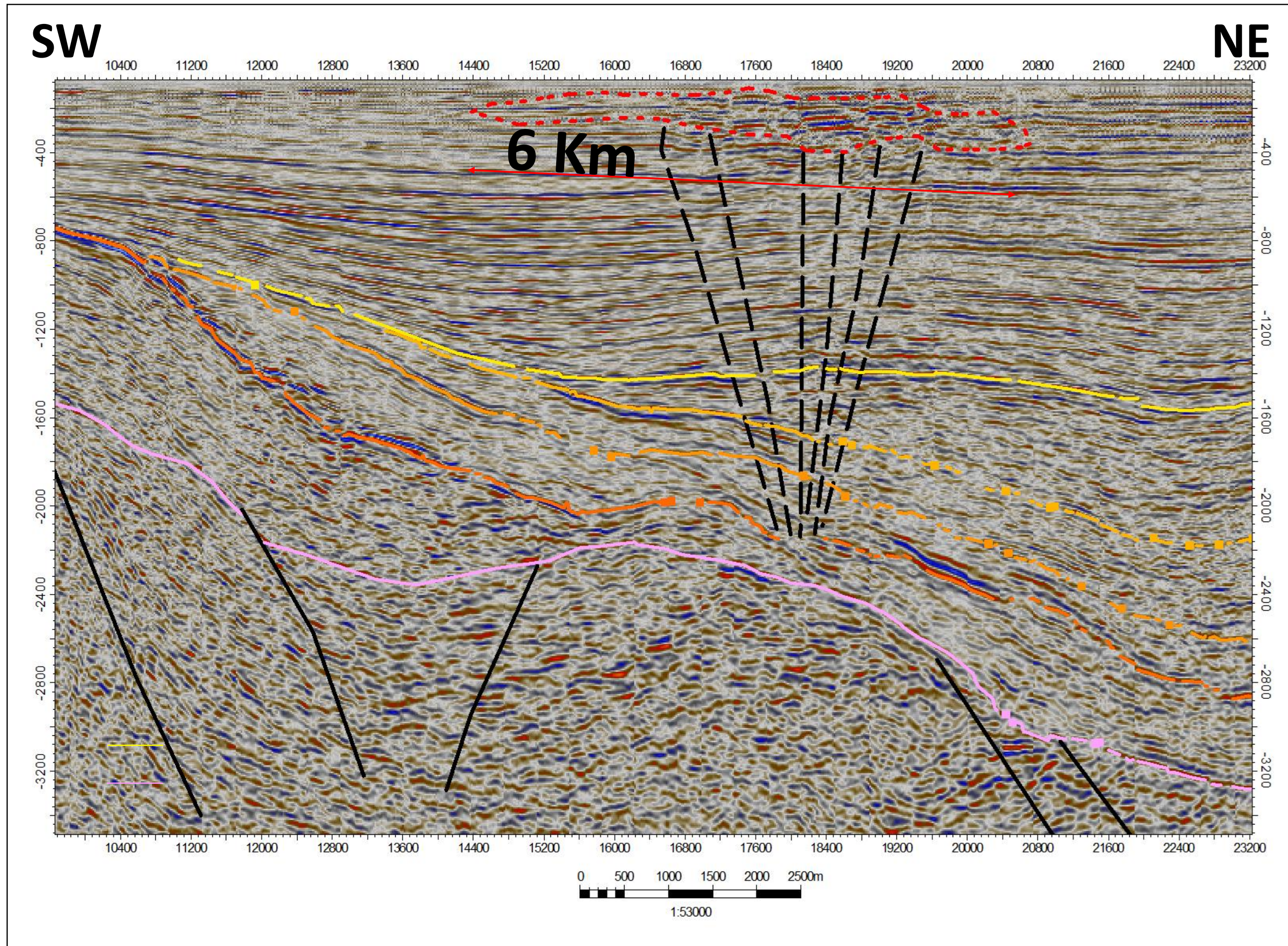
A **gas chimney** is defined as a **gas leakage** from an accumulation with **low seal capacity**.

The presence of gas decreases velocity of the seismic waves producing push down effects of units below

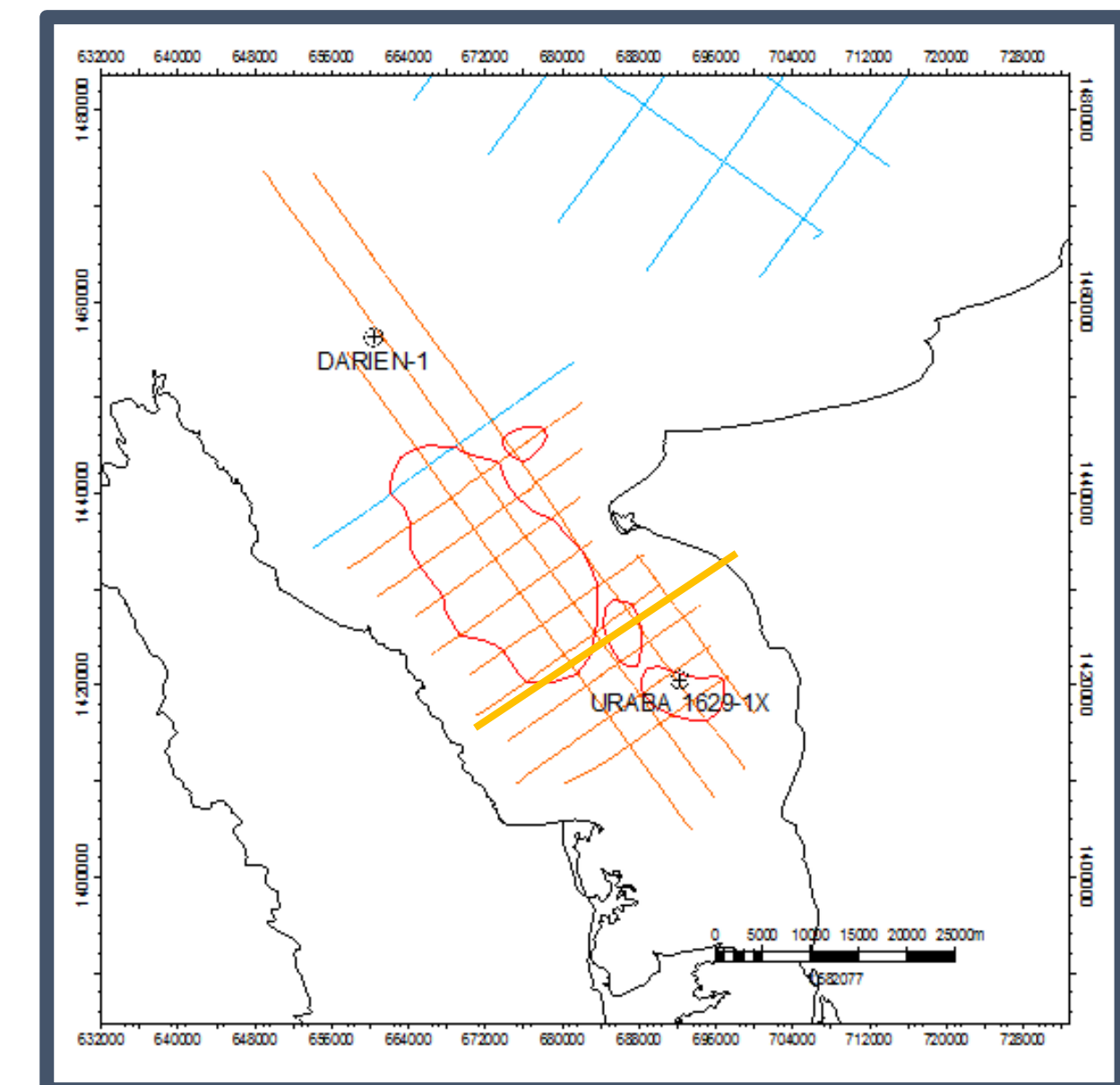
*Taken from Hashemi & Tax (2008)*

# URABA BASIN VOLUMETRICS

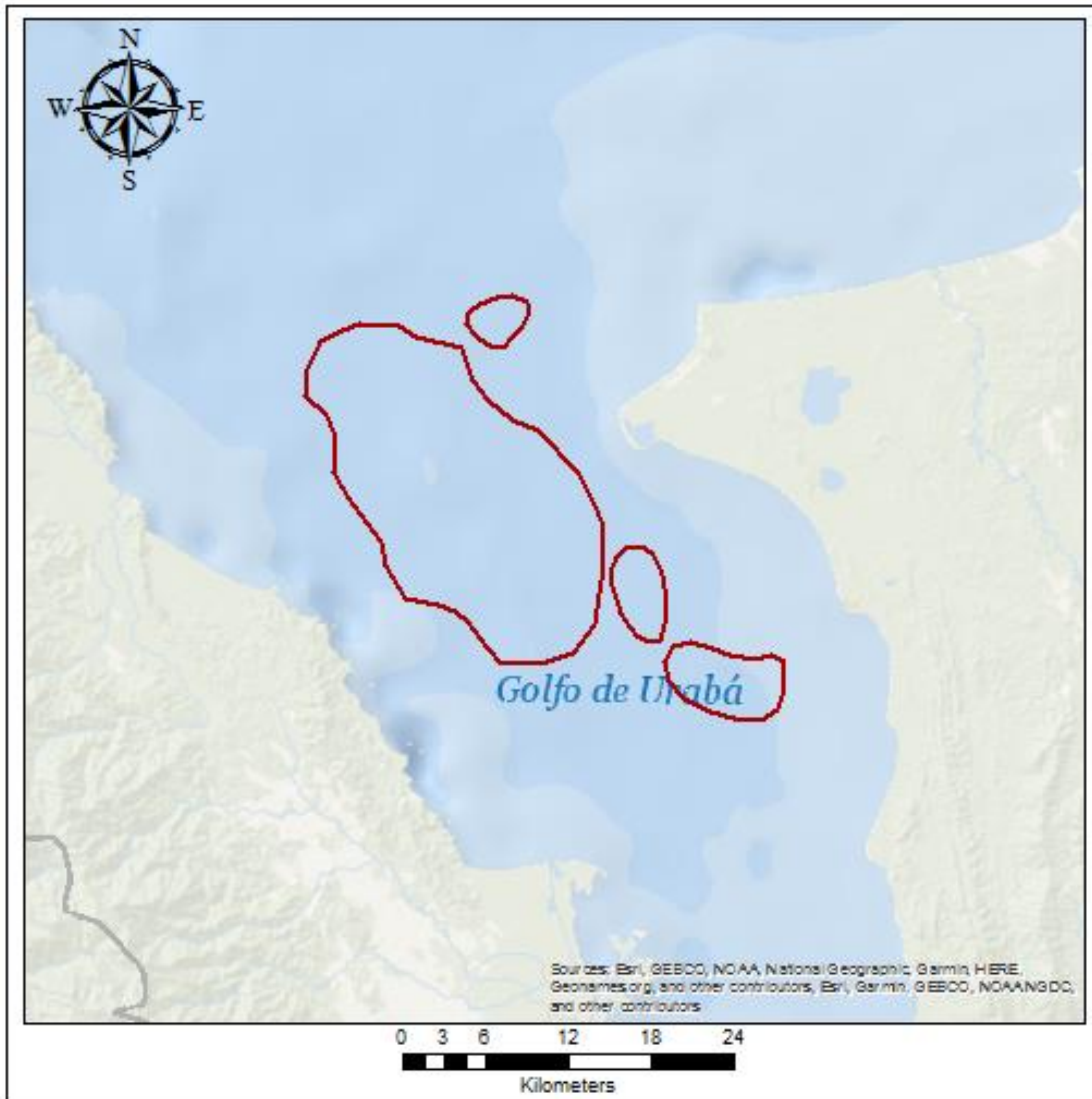
# Seismic Interpretation: Dip Line



- Presence of DHI (gas chimneys)
- Apparently similar reservoir as the ones found in the Pliocene of the Colombia basin
- Shallow seabed: water column (100 m)
- Reckoned as the best place to test the play



*Dip Line: L-1977-27*



## **GAS**

- **4 leads in total**
- **OGIP: 29,96 TCFs**  
  
Recovery factor 85%  
Chance of success 10%
- **Prospective Resources**  
  
High Estimate: 2,54 TCFs  
Best Estimate 1,27 TCFs  
Low Estimate 0,25 TCFs

# Conclusions

- **The Uraba offshore basin** is a **sub-explored basin** where only two wells have been drilled: Uraba 1629-1X (1972) and Darien – 1 (1979).
- The area offered by the ANH (**URA 1-1**) is located **50 km southward** from the E&P blocks **Col 5, Purple Angel and Fuerte Sur**, where wells such as **Gorgon – 1, Purple Angel – 1 and Kronos – 1** have been drilled.
- The wells Urabá- 1629-1X and Darien-1 drilled sediments from the Miocene with limestone reefs at the base and marine sandy levels at the top. The **Miocene limestones and shales** have the potential of being **source rocks (?)** while the **Pliocene sandstones** of being **potential reservoirs**.
- According to interpretations made by Landmark – Halliburton for the ANH in 2007, **stratigraphic traps in calcareous sediments** from the Pliocene could be found as well as **structural traps associated to transpressive faults**.
- The main leads identified by ANH are associated to **possible gas chimneys** related to sandstones from the Plioceno – Pleistocene (?) with a **best estimate of 1,2 TCFs of gas**.

# Thanks

[www.anh.gov.co](http://www.anh.gov.co)