

# Prospectivity Offshore Liberia – Investment Opportunities



# Energy Transition for Africa

- Access to energy is a catalyst for development anywhere in the world. In Africa, energy poverty has been a major constraint not just to economic development but increasingly to trade.
- The fact that we, in Liberia and other African countries are taking some steps toward a clean, healthy world, symbolizes the continent's efforts to reduce greenhouse gases, even though it is only responsible for 3.8% of global emissions
- .... The world draws closer to a cut-off date for this transition... and that is why in Liberia, we have decided to do all we can to work with our potential partners for a better exploration experience while protecting their investment to the fullest.

# Contract Type

<b>Contract Type</b>	<b>Production Sharing Contract (PSC)</b>
<b>Duration</b>	9 Years divided in 3 exploration phases
Divisible into phases and subject to relinquishment at each progression	<b>Phase 1:</b> 3 years (extendable by 1 year), 25% relinquishment
	<b>Phase 2:</b> 2 years (extendable by 1 year), 25% relinquishment
	<b>Phase 3:</b> 2 years, 25% relinquishment

# Our Fiscal Terms (Current Production Sharing Contract)

## Work Commitment

The minimum expenditure commitment for the first. Second and third exploration phases is **Twenty Million (US\$20,000,000.00)** per phase in excess of the cost of acquisition of the existing 2-D and 3-D data.

each phase shall have at least one exploratory well drilled to a minimum depth of two thousand (2,000) meters

Description	Percentage
Royalty on Crude Oil	6%
Royalty on Natural Gas	5%
Corporate Income Tax	15%
Minimum Tax on Production	2%
State Participation	5%
Citizen Participation	5%

## Other Payments

Surface rental	<b>50 per Sq. km (1<sup>st</sup> Exploration)</b>
Surface rental	75 per Sq. km (2nd Exploration)
Surface rental	100per Sq.km (3rd Exploration)
Hydrocarbon Dev. Fund	500,000 (One Time payment)
Rural Energy Fund	100,000 (Annually)
Training	200,000 (Annually)
Social Welfare Contribution	175,000 (Annually)
Signing Bonuses	Negotiable

## Recoverable Petroleum Cost:

The contractor may freely take up to **70%** of Net Royalty Production

Sharing of remaining Oil Production between the State and the Contractor

Nominal pre-tax rate of return for the Exploitation Area	State's share of Remaining Oil Production or Remaining Natural Gas Production	Contractor's share of Remaining Oil Production or Remaining Natural Gas Production
19% or Less	25%	75%
Greater than 19%- 25%	45%	55%
Greater than 25%	70%	30%

# Licensing

- Petroleum Rights are given through Competitive Bidding after pre-qualification (We had a Licensing Round in 2020)
- Executive Allocation to NOCAL, where the President (in consultation with the Legislature) announces 100% Interest in a Block to NOCAL and some of this interest is divested through farm-out
- Direct Negotiation, where interested investors are required to send a letter of intent to the LPRA, get pre-qualified and then move on to the negotiation process and subsequent signing of the PSC (presently ongoing, with deadline

# Liberia

## Exploration History



### Results:

- **Hydrocarbon** presence at multiple stratigraphic levels
- **Reservoir** quality sandstones Albian to Campanian age
- Effective **source rocks** in Albian & Upper Cretaceous
- Effective **seal rocks**

### Lower Cretaceous Reservoirs:

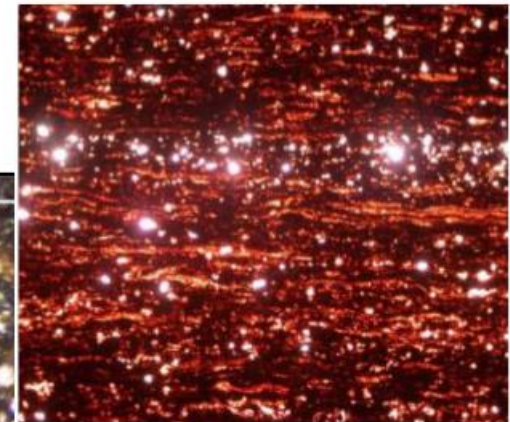
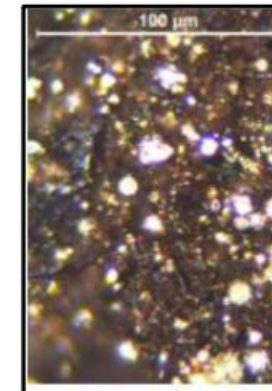
- **Narina-1/1z:** 11m Albian pay
- **Bee Eater-1:** 14m Albian Pay
- **IIB-1, H3-1, A1-1, A2-1, Apalis-1:** *oil shows in Albian sandstones*

### Upper Cretaceous Reservoirs:

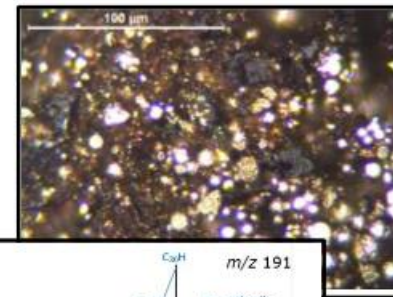
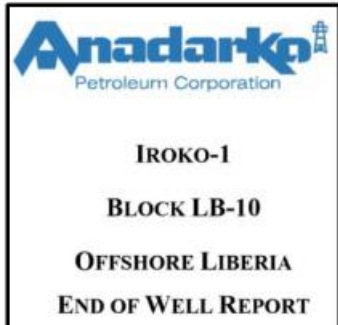
- **Narina-1/1z:** 21m Upper Turonian pay
- **Montserrat-1:** 7m Turonian pay (in secondary objective)
- **Bee Eater-1:** non-commercial Turonian & Cenomanian pay
- **Nighthawk-1, Iroko-1 & Timbo-1:** *oil shows in Late Cretaceous sandstones*

### Source Rocks:

- **Aptian-Albian:** Three or more oil-prone marine and lacustrine source rocks (Type II/III kerogen)
- **Cenomanian-Turonian:** organic-rich marine shales (Type II kerogen)

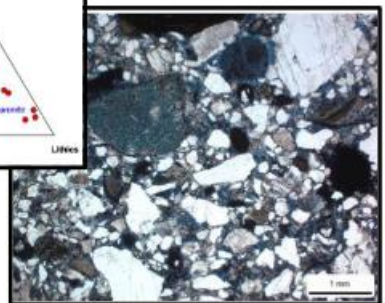
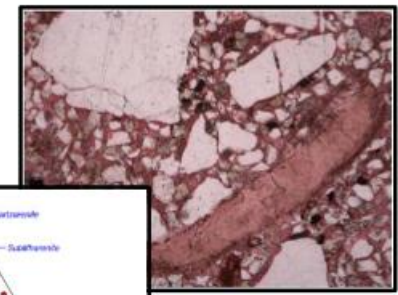
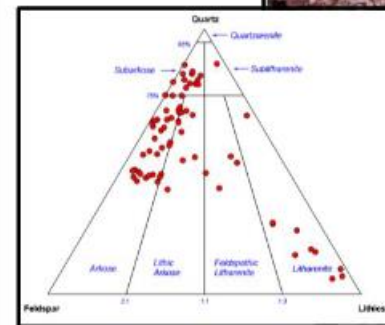
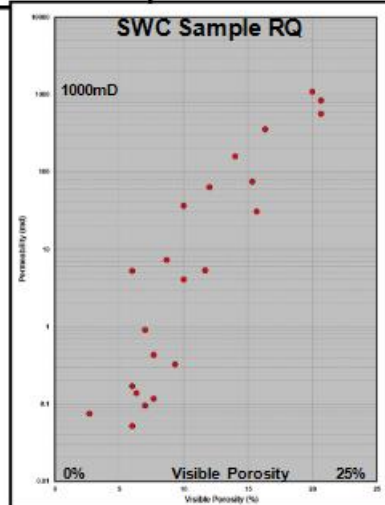
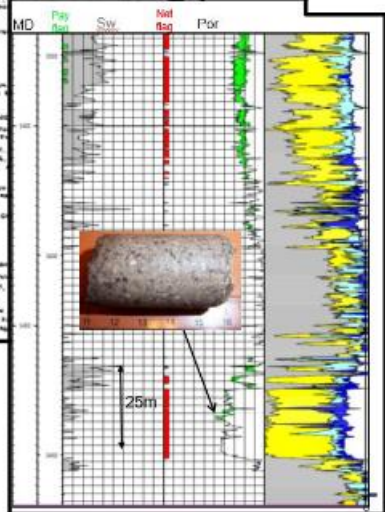
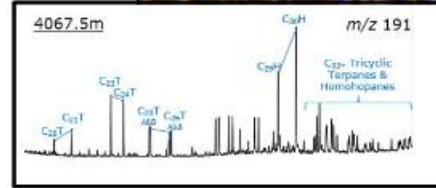
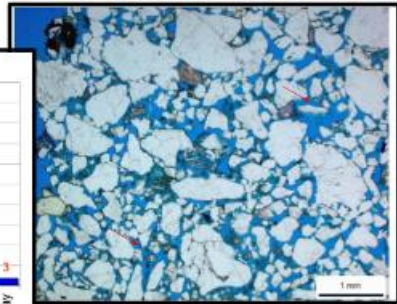
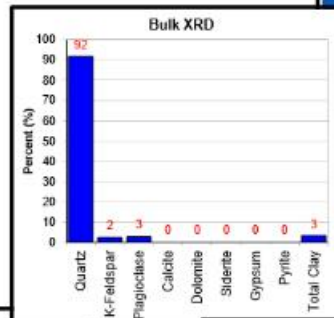


# Liberia Exploration History



AMOCO LIBERIA CORE DESCRIPTION SHEET

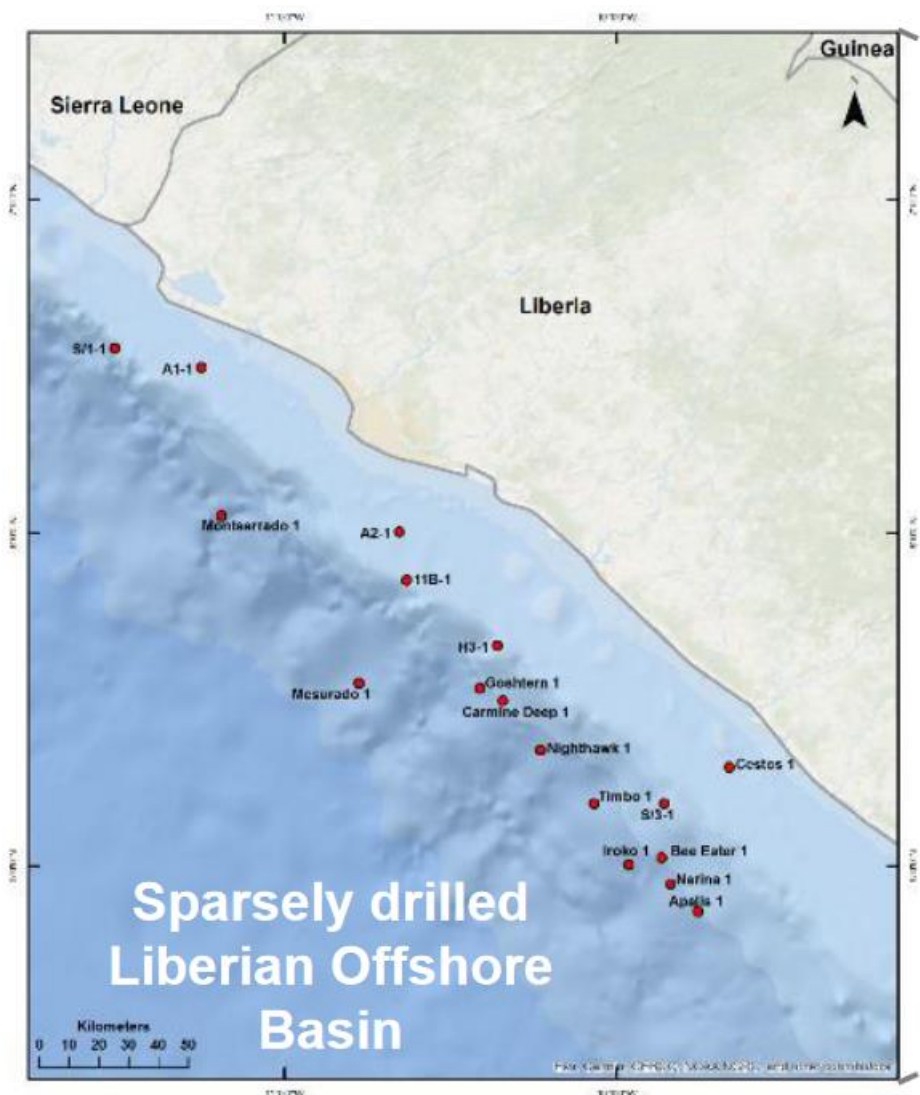
DEPTH (m)	DESCRIPTION	REMARKS
0.00 - 0.30	...	...
0.30 - 0.60	...	...
0.60 - 0.90	...	...
0.90 - 1.20	...	...
1.20 - 1.50	...	...
1.50 - 1.80	...	...
1.80 - 2.10	...	...
2.10 - 2.40	...	...
2.40 - 2.70	...	...
2.70 - 3.00	...	...
3.00 - 3.30	...	...
3.30 - 3.60	...	...
3.60 - 3.90	...	...
3.90 - 4.20	...	...
4.20 - 4.50	...	...
4.50 - 4.80	...	...
4.80 - 5.10	...	...
5.10 - 5.40	...	...
5.40 - 5.70	...	...
5.70 - 6.00	...	...
6.00 - 6.30	...	...
6.30 - 6.60	...	...
6.60 - 6.90	...	...
6.90 - 7.20	...	...
7.20 - 7.50	...	...
7.50 - 7.80	...	...
7.80 - 8.10	...	...
8.10 - 8.40	...	...
8.40 - 8.70	...	...
8.70 - 9.00	...	...
9.00 - 9.30	...	...
9.30 - 9.60	...	...
9.60 - 9.90	...	...
9.90 - 10.20	...	...
10.20 - 10.50	...	...
10.50 - 10.80	...	...
10.80 - 11.10	...	...
11.10 - 11.40	...	...
11.40 - 11.70	...	...
11.70 - 12.00	...	...
12.00 - 12.30	...	...
12.30 - 12.60	...	...
12.60 - 12.90	...	...
12.90 - 13.20	...	...
13.20 - 13.50	...	...
13.50 - 13.80	...	...
13.80 - 14.10	...	...
14.10 - 14.40	...	...
14.40 - 14.70	...	...
14.70 - 15.00	...	...



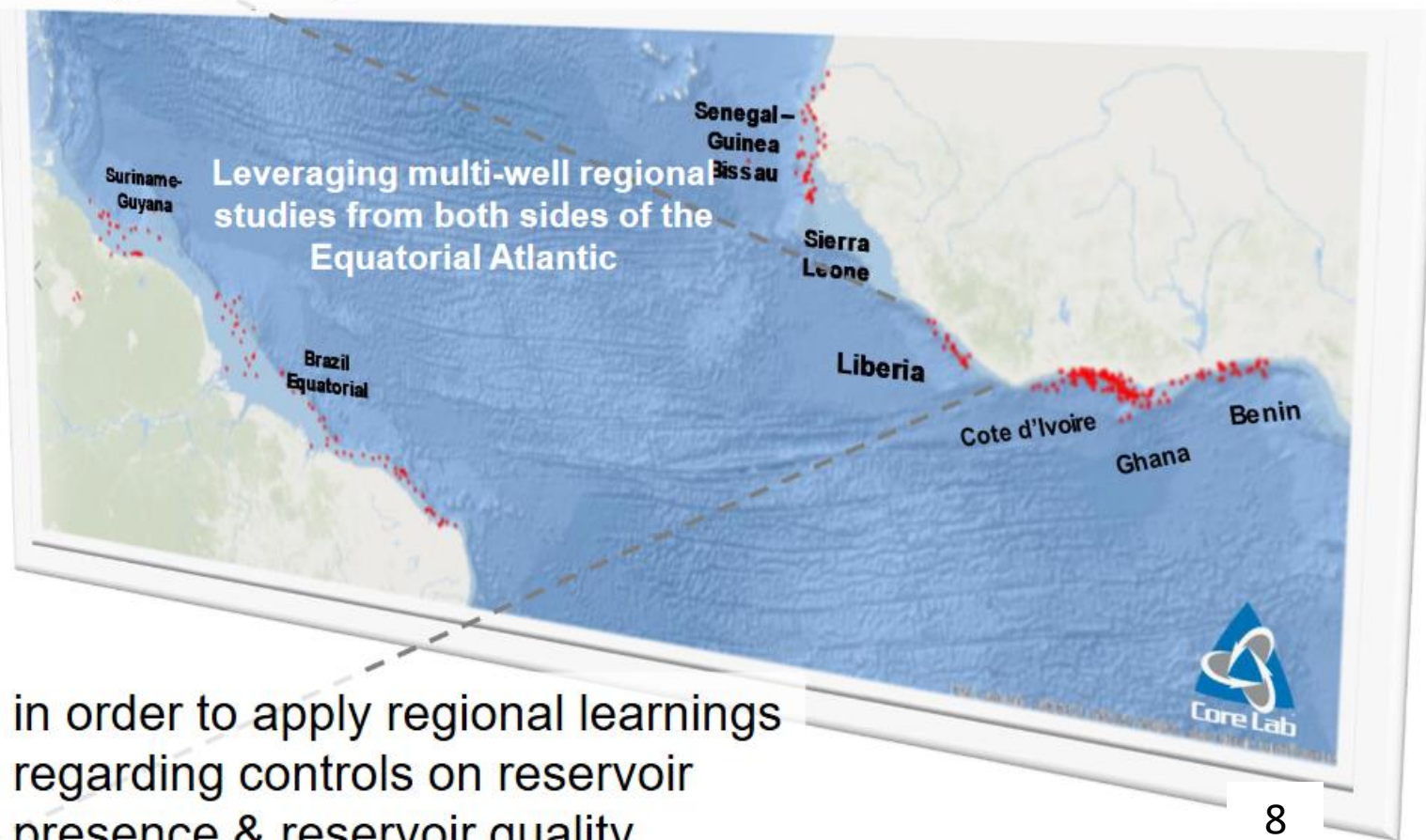
## Rock & Fluids Database

- Pre-Drill & EOW Reports
- Downhole Logs & Composite logs
- Core, SWC & Cuttings Data
- Stratigraphic Reports
- Log & Laboratory Petrophysical Data
- Image Log Data
- Geochemistry Data

# Future Exploration Success Regional Knowledge



Core Lab approach is to evaluate legacy Liberian well datasets in a greater regional context



in order to apply regional learnings regarding controls on reservoir presence & reservoir quality



# Future Exploration Success Lower Cretaceous Targets



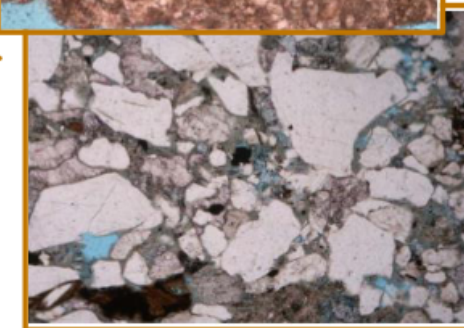
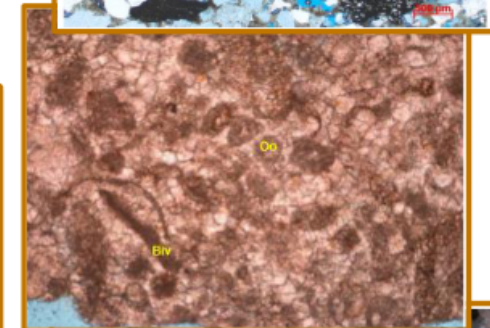
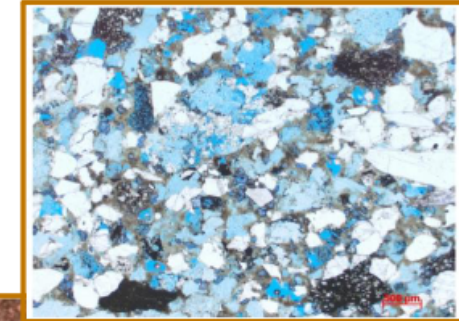
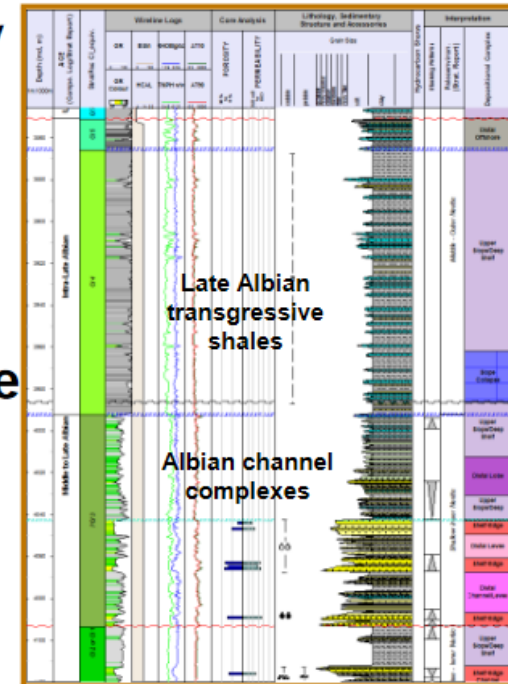
## Albian Reservoirs (WATM)

- Late Syn-Rift & Early Post-Rift Phases
- Higher risk of coarse-grained immature sediments sourced from basin margin fans
- Good to excellent reservoir quality sandstones within well-developed delta front lobes and channel complexes
- Latest Albian transgressive shale – forms important seal and source rock
- Local limestone development (form significant reservoirs on Guyana Margin) – POTENTIAL ADDITIONAL DRILLING TARGETS?

## Albian Reservoirs (Liberia)

- Range of fine to coarse-grained clastics in shelf-edge & slope channels
- Locally-developed limestones
- Igneous activity

### Delta Front/Slope Sandstones



# Future Exploration Success Cenomanian – Campanian Targets

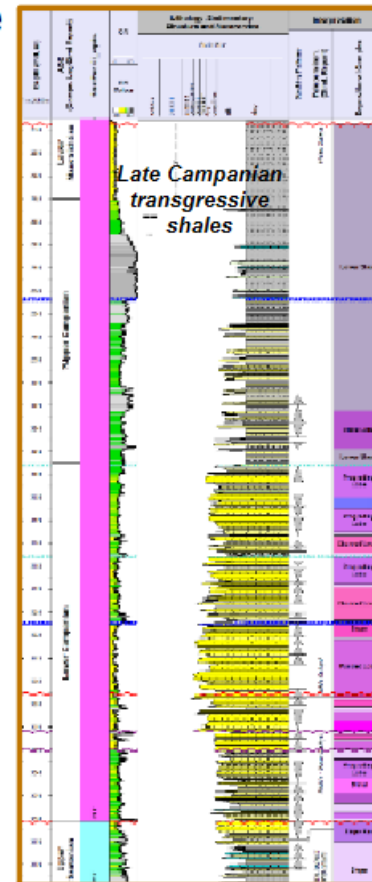


## Cenomanian-Campanian Reservoirs (WATM)

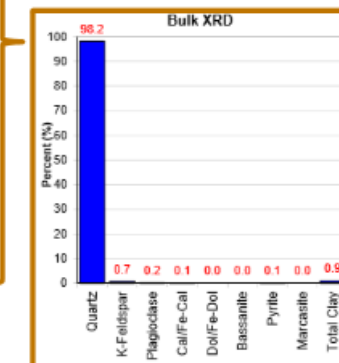
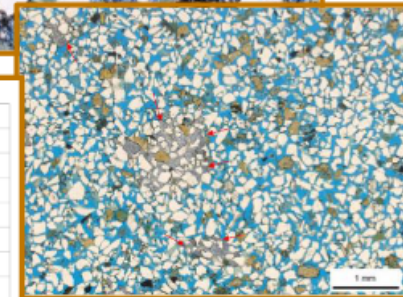
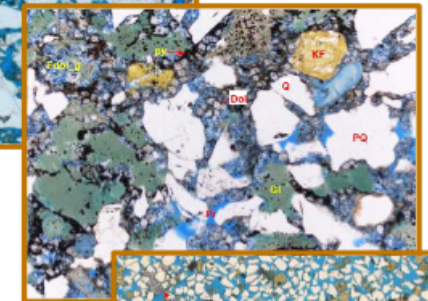
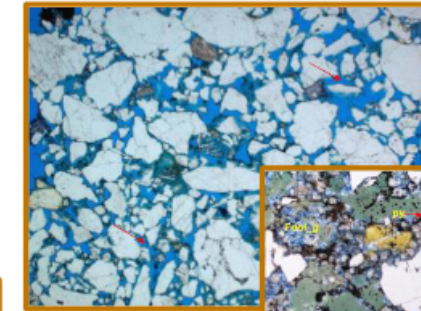
- Syn-Transform Phase: Cenomanian & Campanian regressions with renewed influx of coarse clastics
- Fine to coarse-grained sandstones within shelf-edge and slope channels
- Interbedded transgressive shale horizons – form source rocks & seals
- Localized limestone development – rarely targeted but may also locally form good reservoirs

## Cenomanian-Campanian Reservoirs

- Some immature sediments, but clean, quartz-rich sandstones observed in some wells
- Locally thick, ponded sands
- Variable compaction & cementation



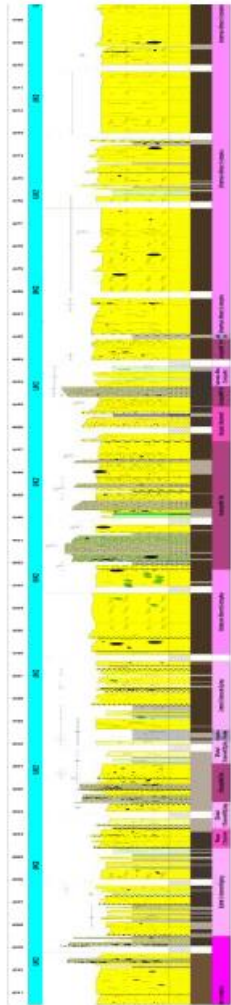
### Slope Channel/Lobe Sandstones



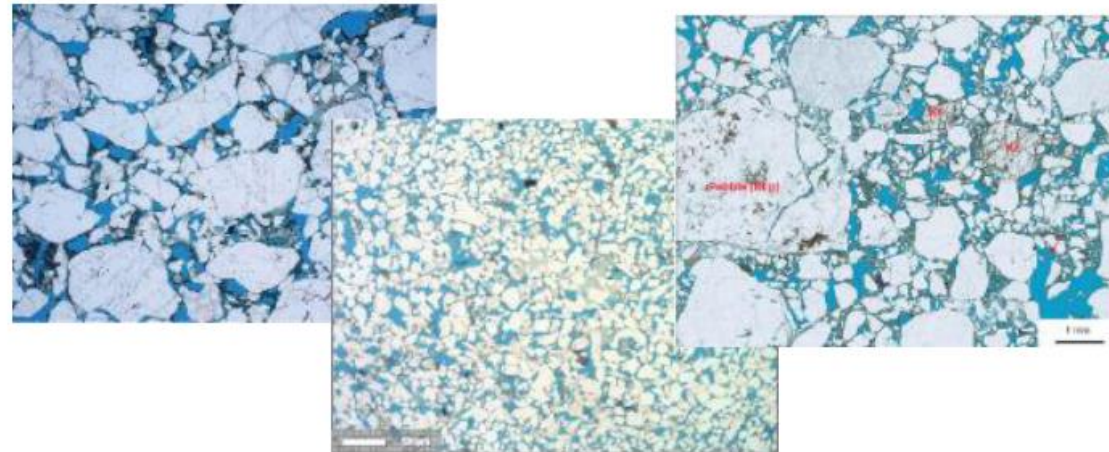
# Future Exploration Success Upper Cretaceous Analogues



Sand-rich slope channel complexes – locally ponded on upper slope



## TANO BASIN: Cenomanian-Campanian Analogues



High porosity/high permeability sandstones



# Liberia – TGS Data Library (2D, 3D)



3D

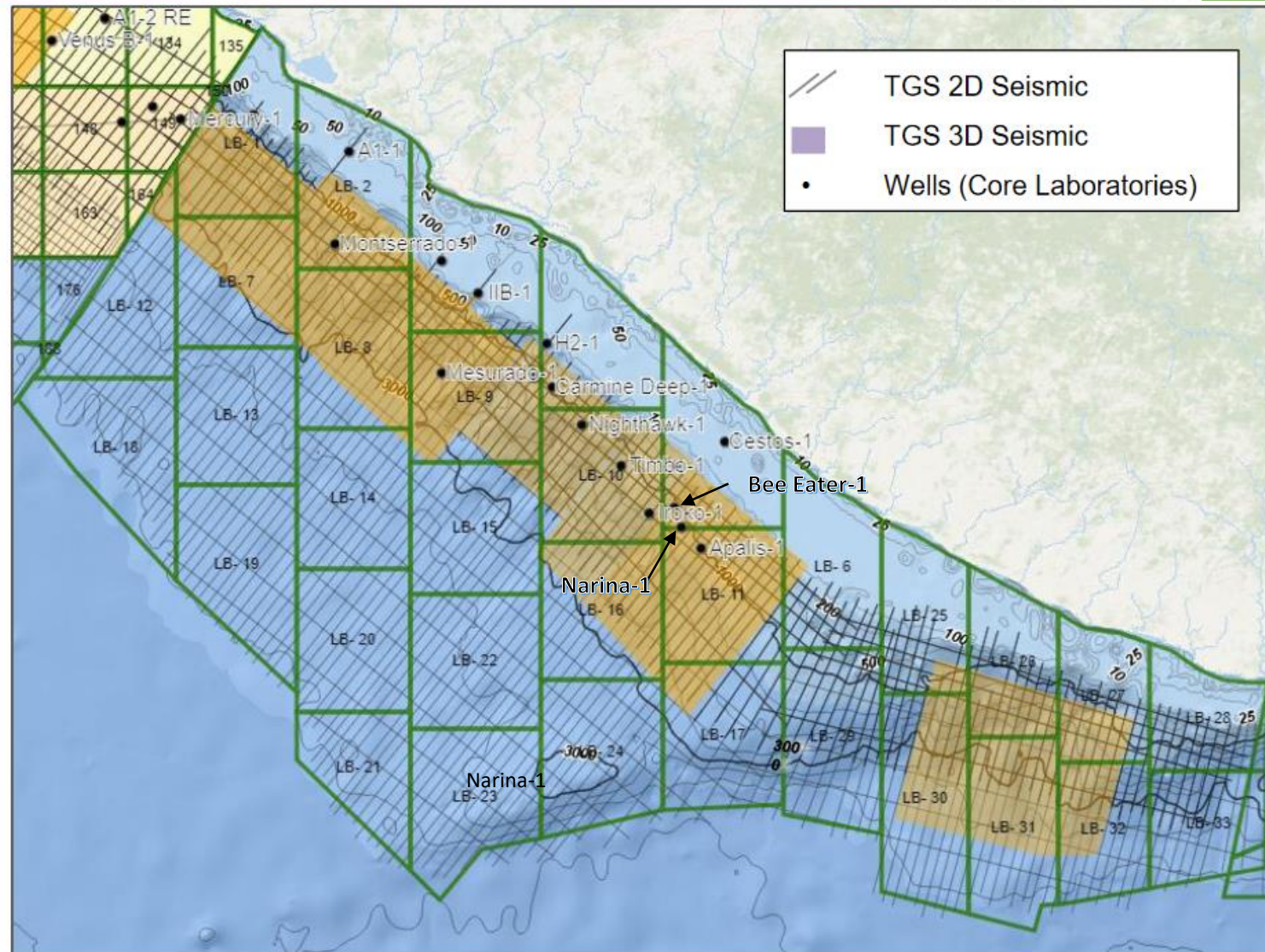
24,500 km<sup>2</sup>

21,500 km<sup>2</sup> in Depth

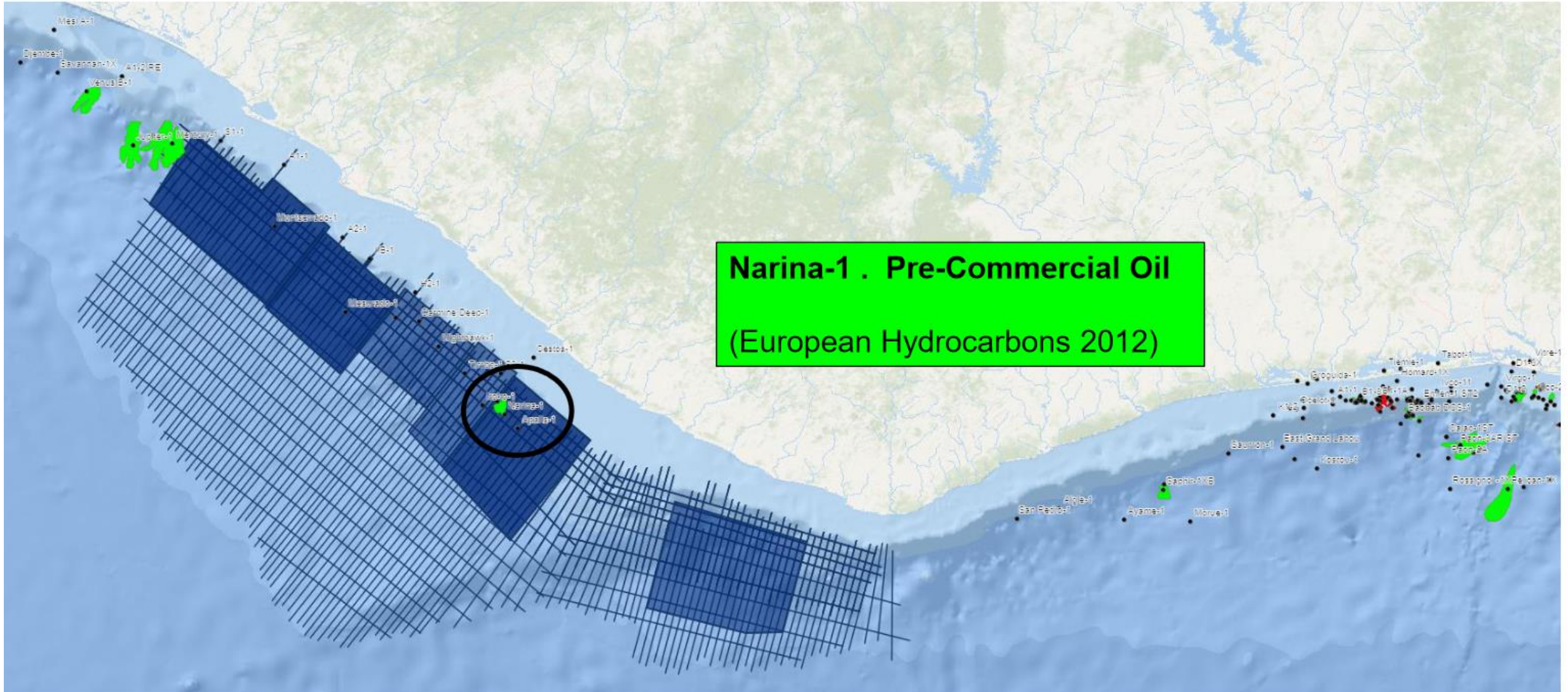
2D

34,000 km

10,000 km in Depth



# Pre-commercial Success, Narina

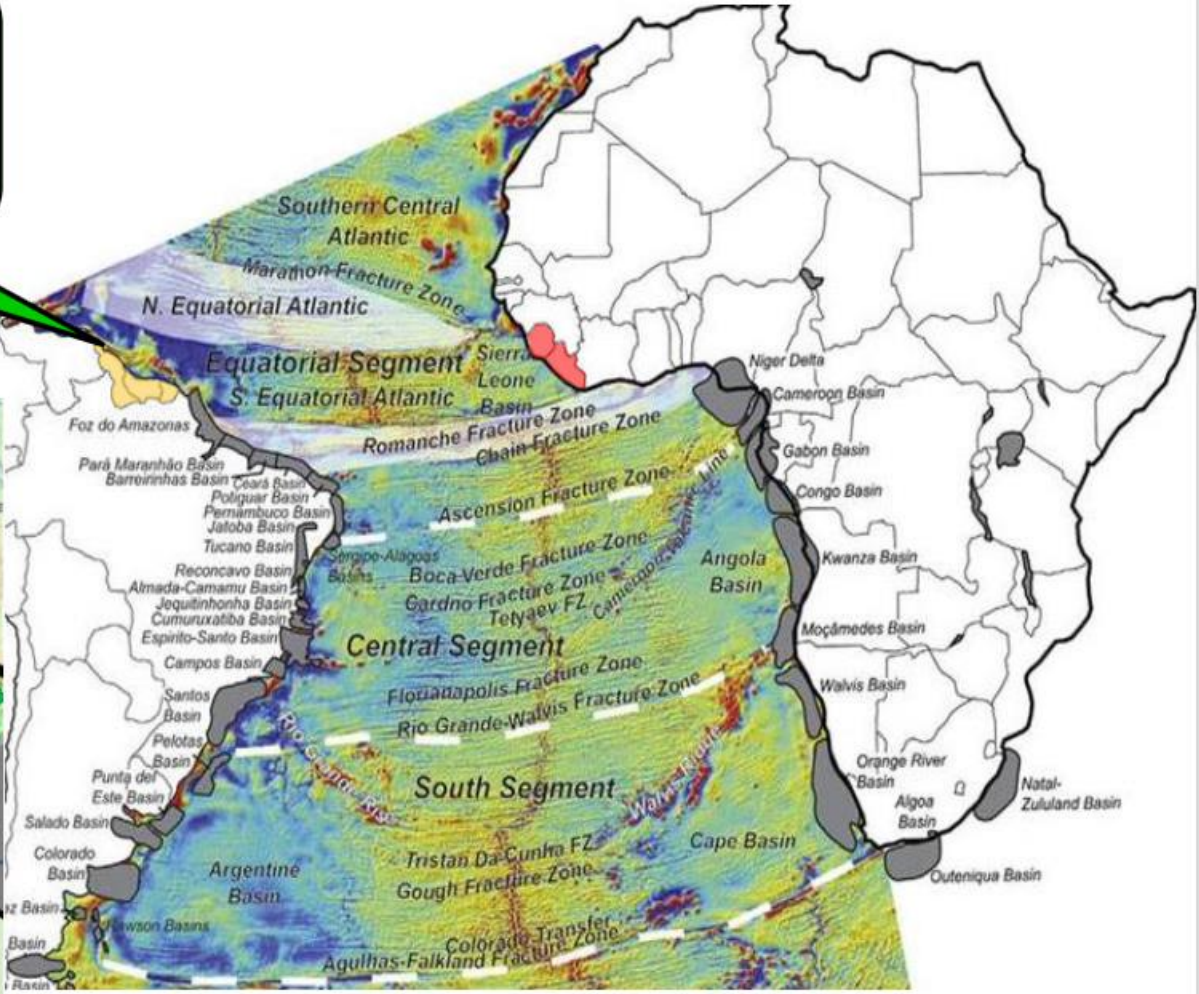
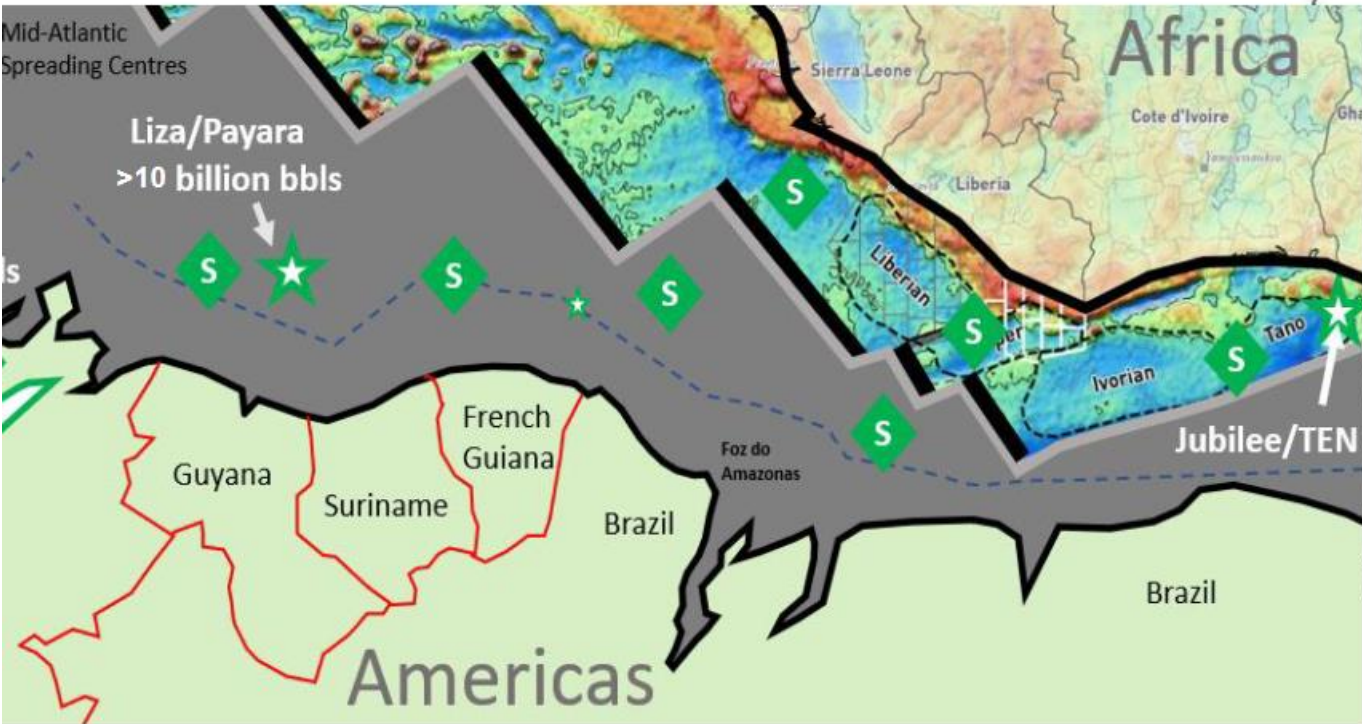


**Narina-1 . Pre-Commercial Oil**  
(European Hydrocarbons 2012)

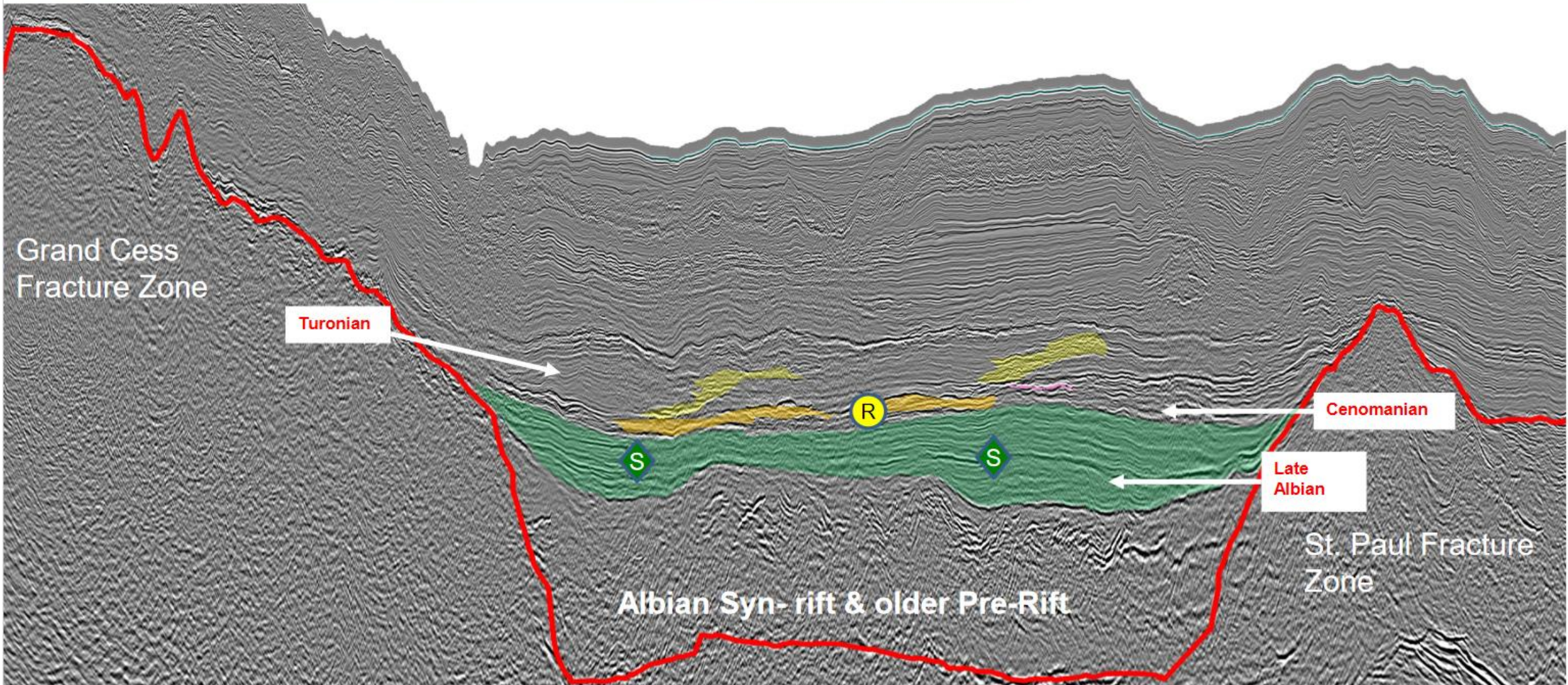
# Organic-Rich Source Rock



Late Cretaceous Source Rock proven @Conjugate (multi billion bbls oil)

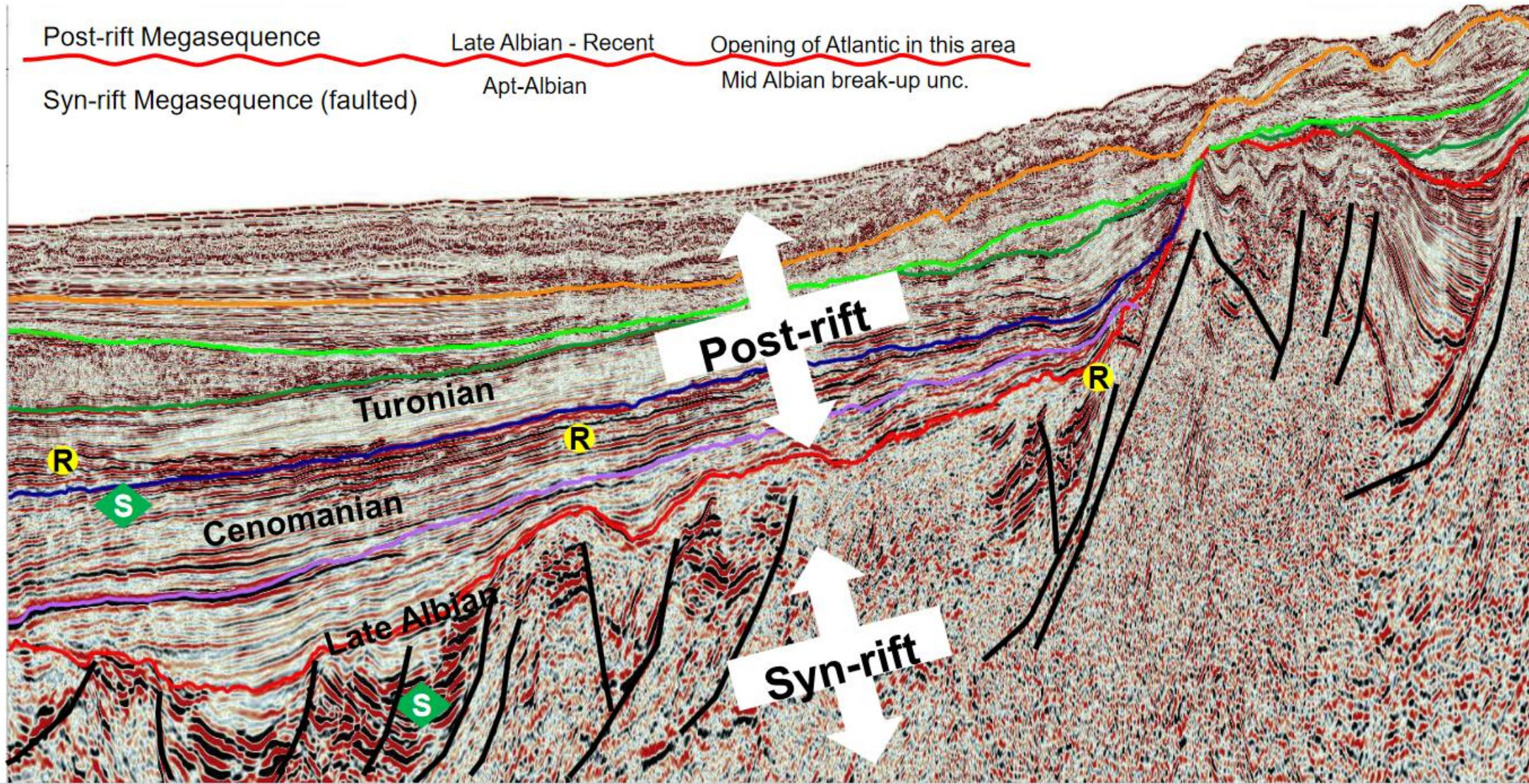


# Reservoir Fairways, Source Rock

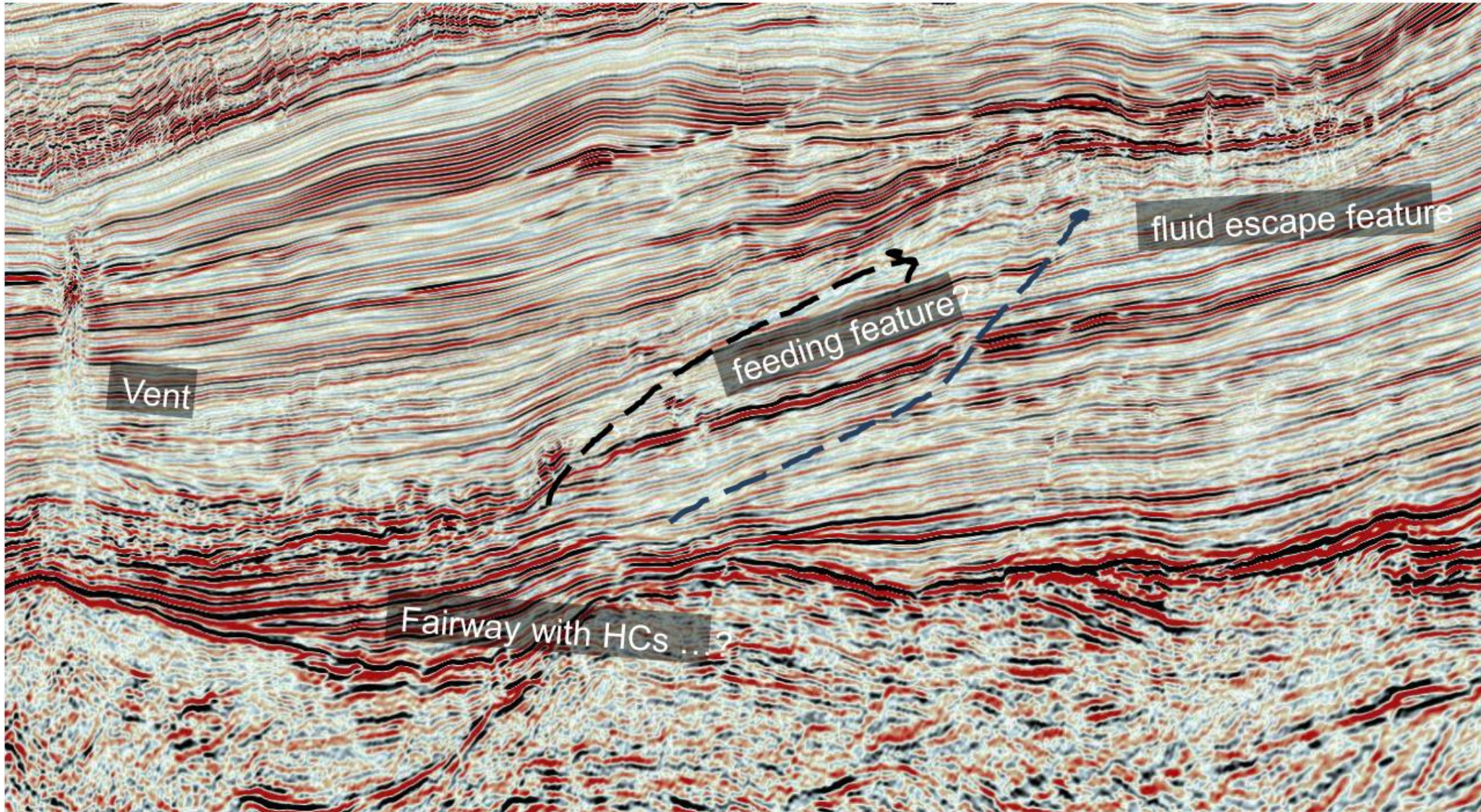




# Several phases of Reservoir Influx



# Hydrocarbon indicators on Amplitude



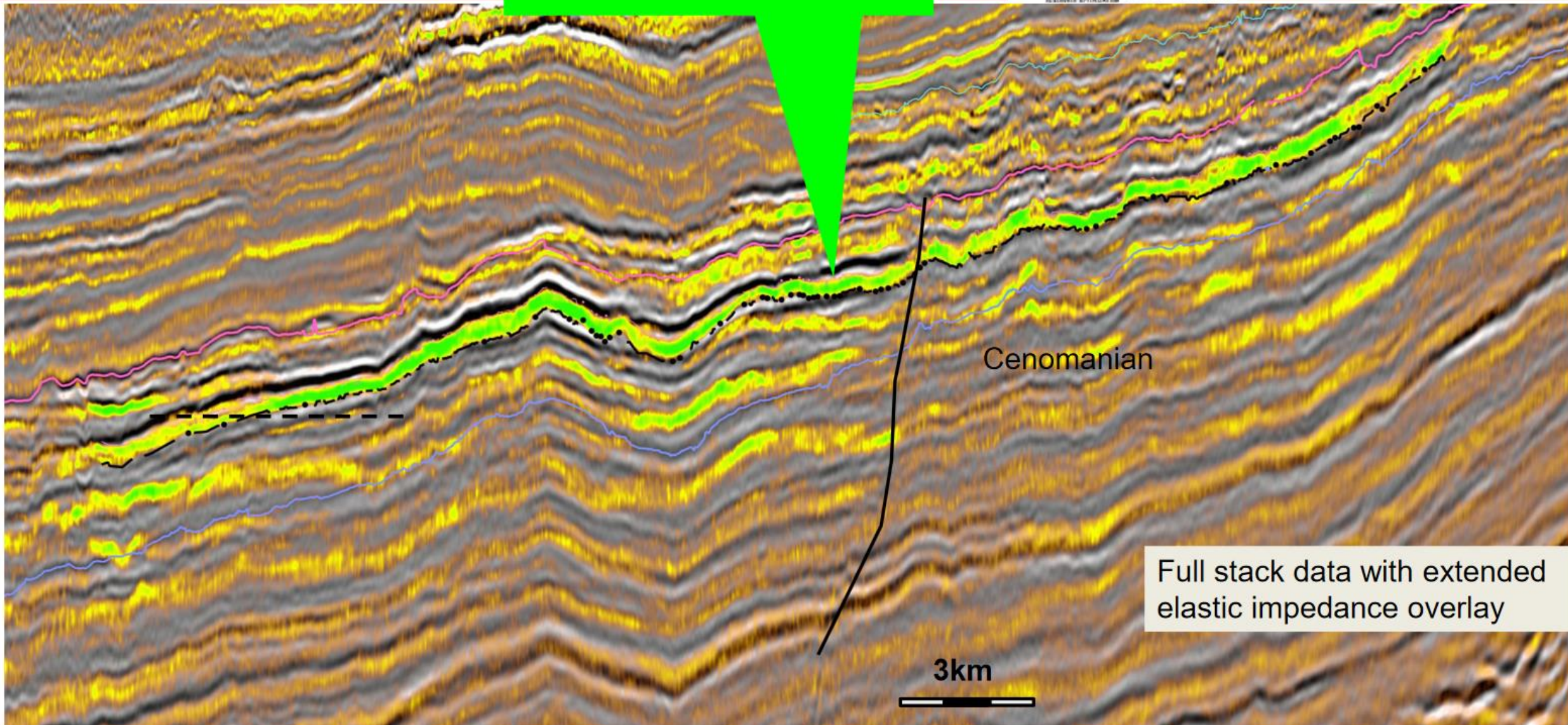
# Undrilled Prospects

Prospect  
(> 300M bbls mean reserves)

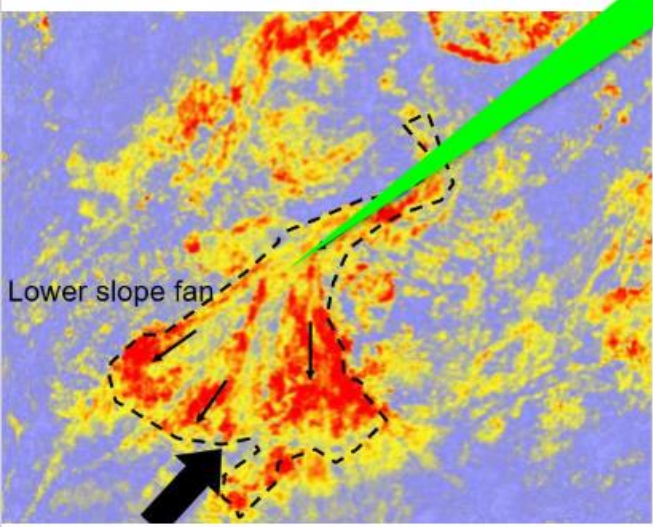
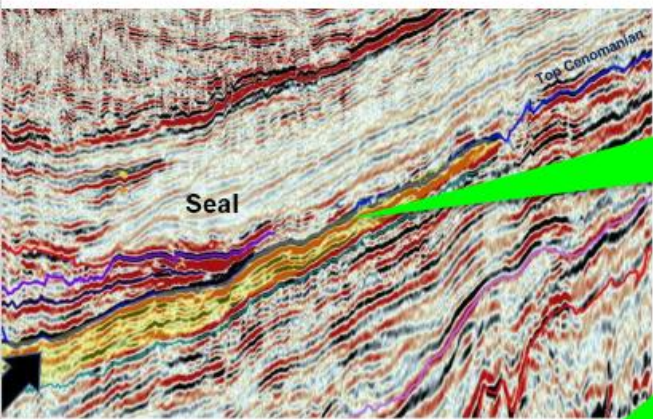
TGS



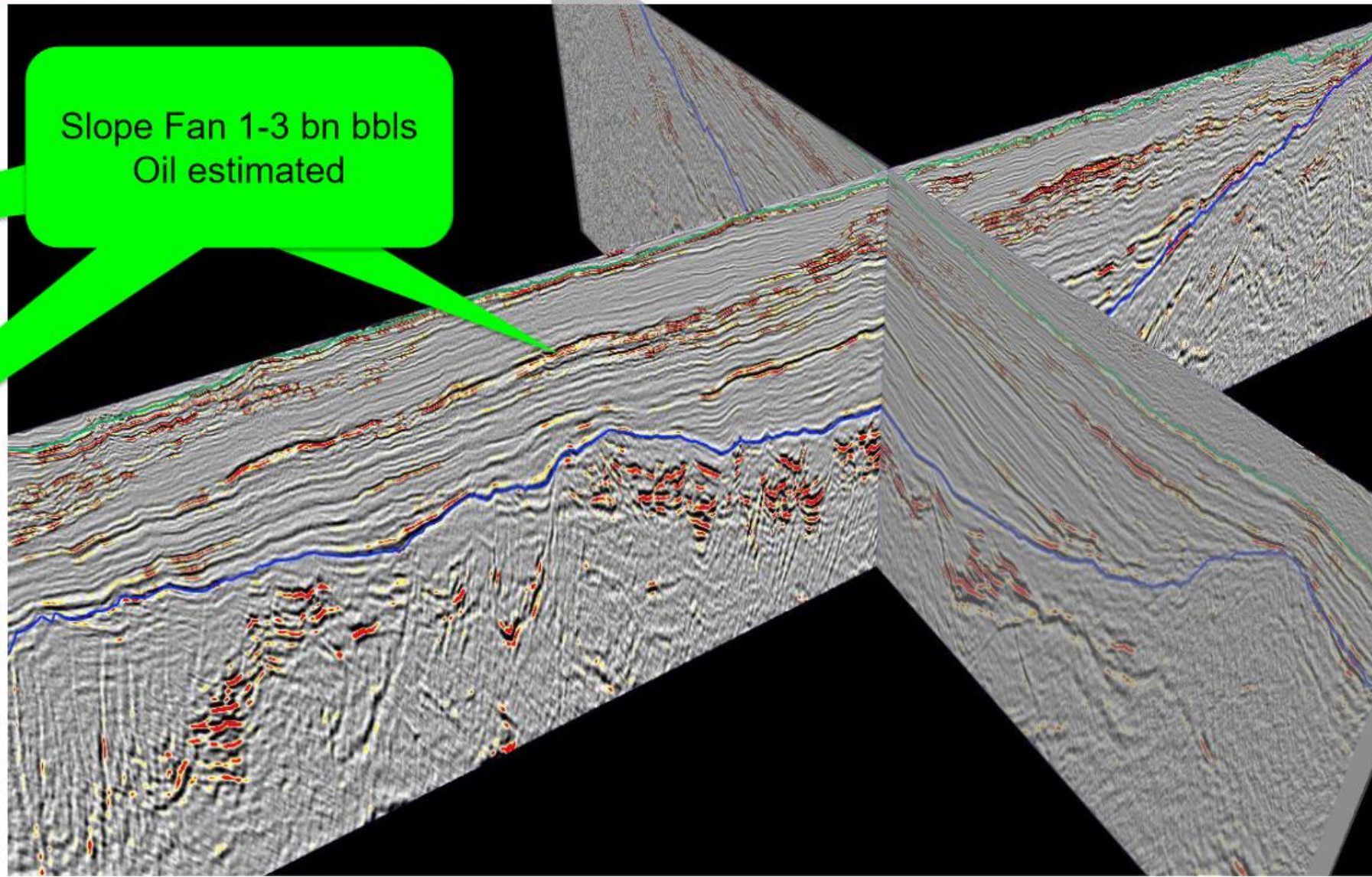
LPRA



# Undrilled Prospects



Slope Fan 1-3 bn bbls  
Oil estimated



For more information  
Please contact

Atty. Saifuah-Mai Gray, President & CEO of NOCAL