



GeoPartners

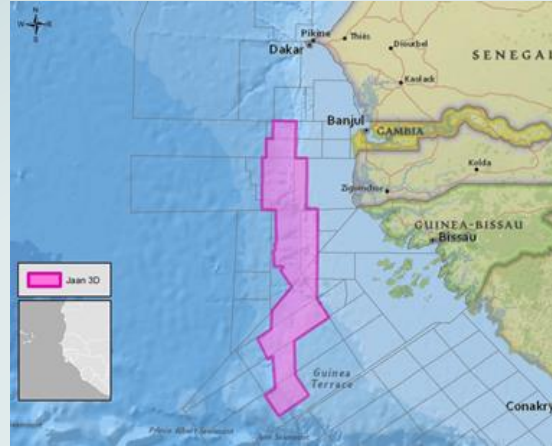
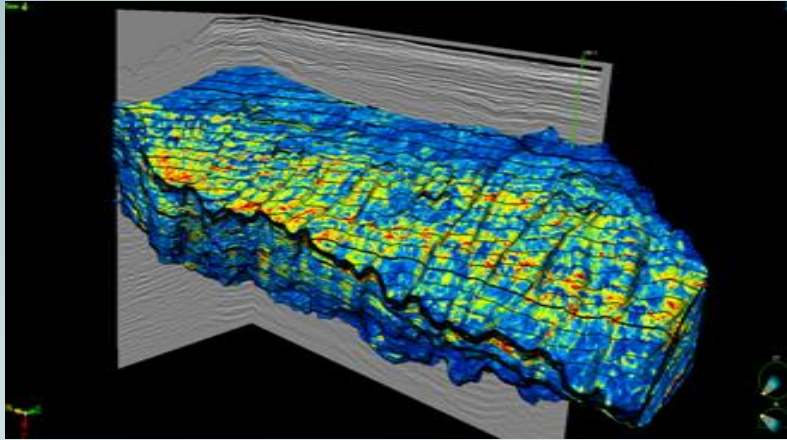
Review and Forecast: 10 years of African Discoveries

BEN SAYERS

Partner

INTRO

Core Services



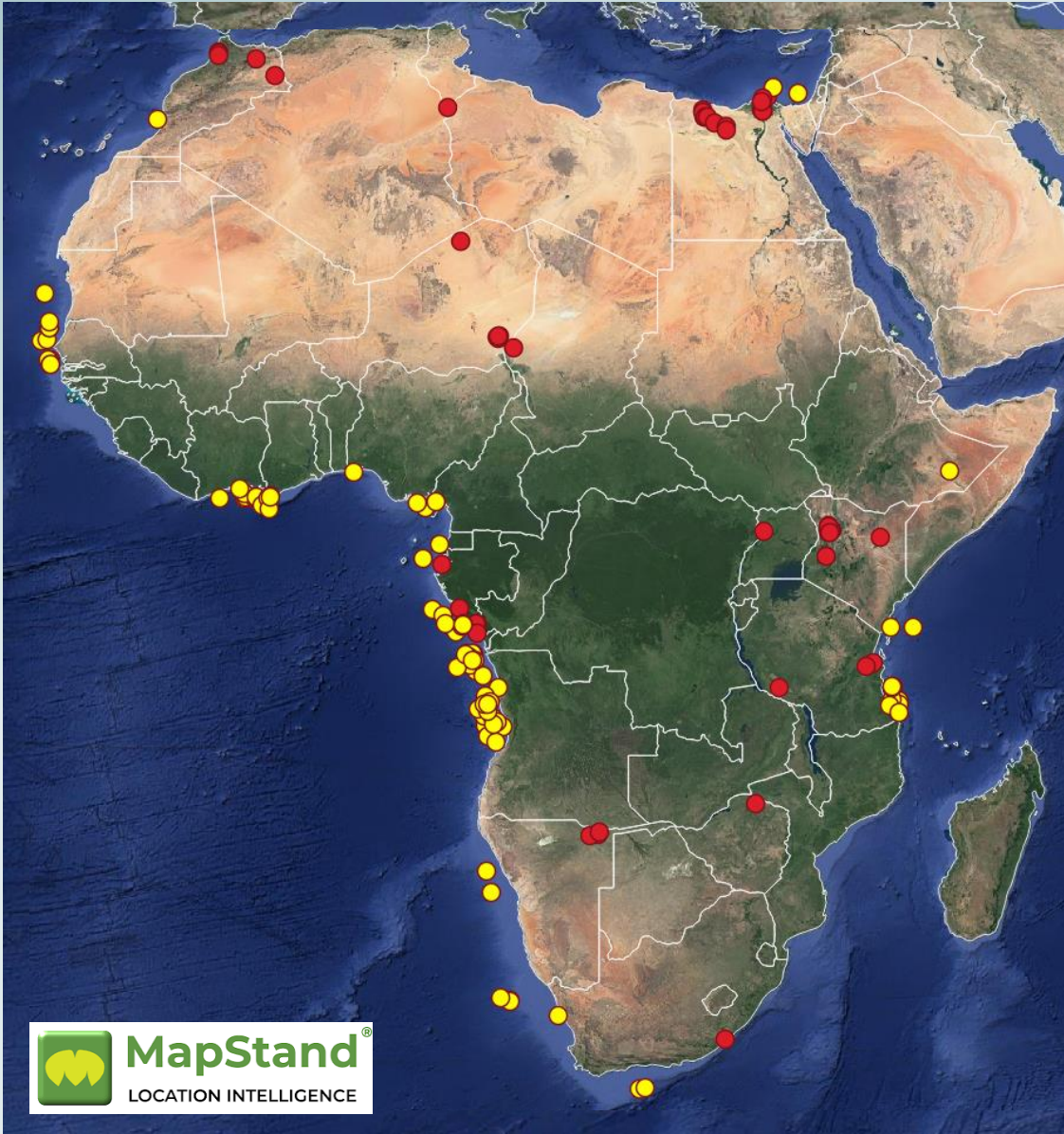
GeoPartners are an established International Geophysical and Geological company, specializing in providing a range of technical support services to Government Agencies, National Oil Companies and the International Energy Industry. We have a global portfolio in the creation, acquisition, marketing and financing of Multi-Client Projects. In November 2022, we celebrated 13 years of activities in Europe and Africa.

CORE SERVICES:

- Survey Design
- Seismic Data Acquisition
- Land, Marine, TZ, 2D, 3D
- Seismic Data Processing
- Depth Imaging
- Multi-Client Surveys
- Interpretation Services
- Licence Rounds
- Technical Advisories
- Project and Quality Control
- Gravity/Magnetic/Resistivity
- Rock Physics

**PART I –
SETTING THE SCENE**

2013-2023 Discoveries in Africa



In 10 years of exploration drilling in Africa there have been 154 discoveries.

Of these 102 discoveries were offshore

**Of these 54 were drilled in “Deepwater”
DW defined as > 1200m**

**AND 24 in “Ultra Deepwater”
UDW defined as > 2100m**

2013 Discoveries in Africa

Afren/Lekoil discovered 775 million BOE at the Ogo offshore block in Nigeria.

Nene Marine discovery in Congo Brazzaville by Eni -- 700 million BOE

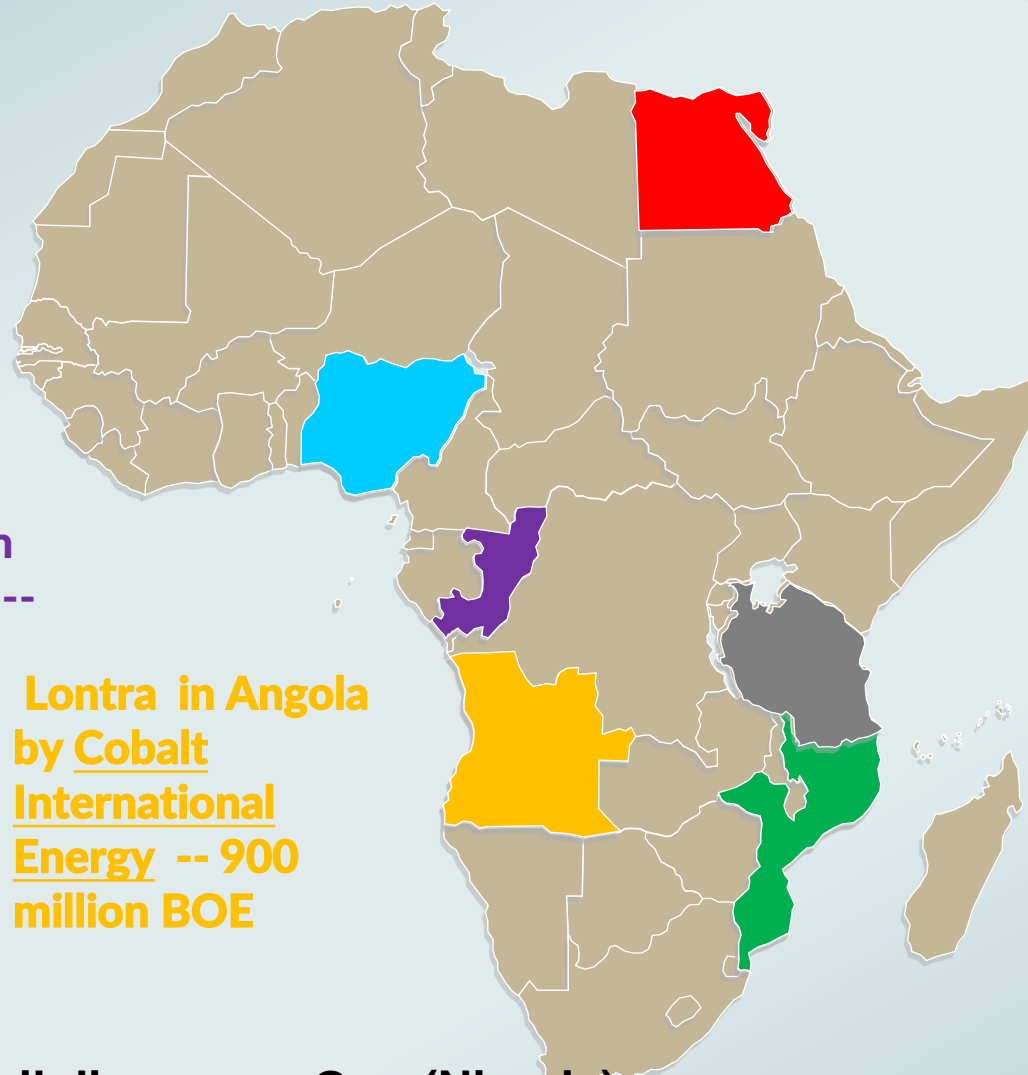
Lontra in Angola by Cobalt International Energy -- 900 million BOE

Salamat gas discovery in Egypt's East Nile Delta by BP -- 500 million BOE

Tangawizi gas discovery offshore Tanzania by Statoil -- 575 million BOE

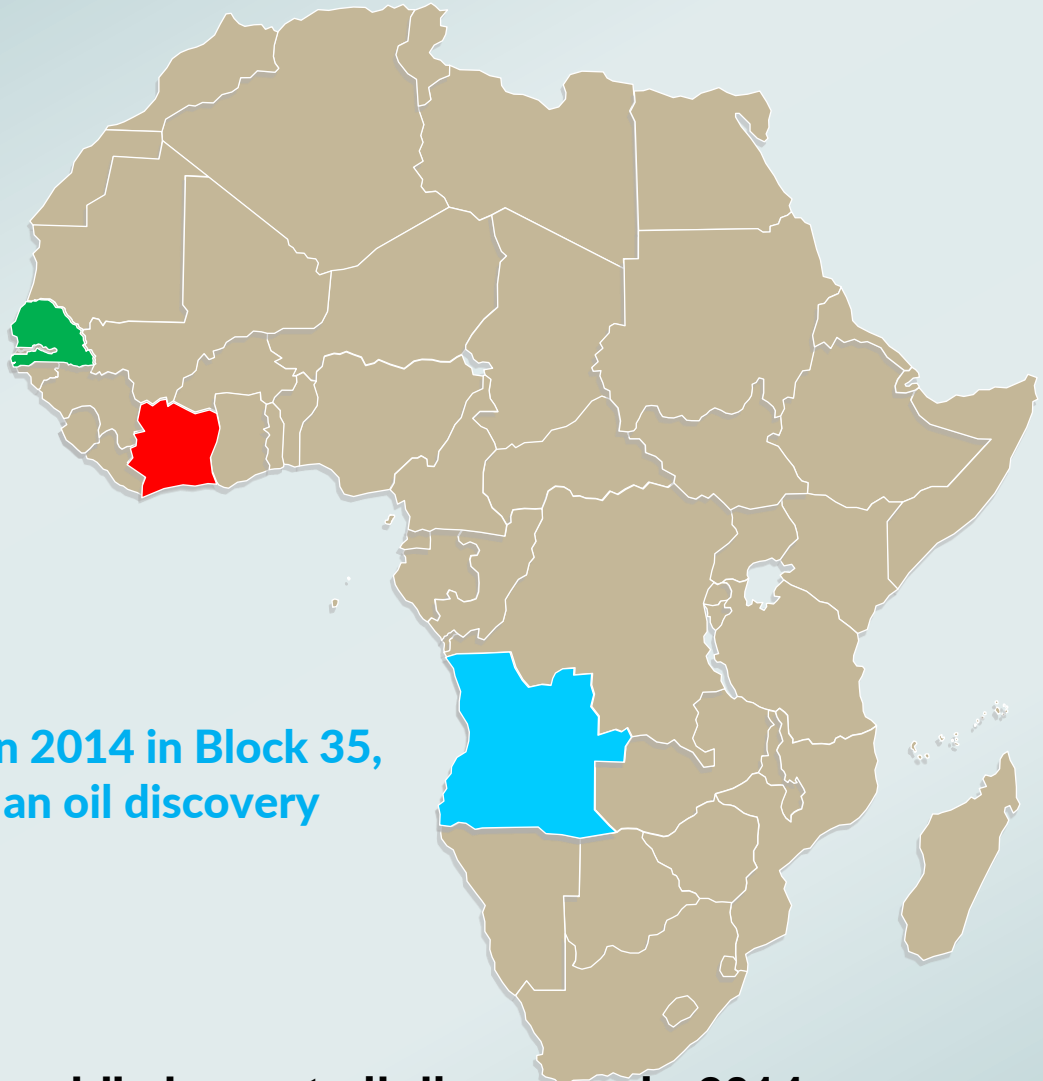
Also in December 2013, Statoil, along with partner ExxonMobil, touted a fifth discovery in offshore block 2, off Tanzania. The Mronge-1 well contained 2-3 Tcf of natural gas

Agulha/Coral gas discoveries offshore Mozambique by Eni -- 700 million BOE each



This year's top global oil discovery: Ogo (Nigeria) This year's top global gas discovery: Mronge (Tanzania)

2014 Discoveries in Africa



Apr 2014: The Saphir-1XB exploration well on Block CI-514 has proved the presence of oil in 2,300m of water off the west of the country. This is the first discovery in the San Pedro Basin.

Ombovo-1 (ENI), drilled in 2014 in Block 35, Angola was presented as an oil discovery

FAN-1 – Senegal located in 1,427 metres water depth and drilled to a depth of 4,927 m.
– 29m of net oil-bearing reservoir in Cretaceous sandstones;
– Gross oil bearing interval of more than 500m;
– Distinct oils types ranging from 28° API up to 41° API indicated so far from a number of oil samples recovered to surface;
– STOIP estimates for the FAN-1 well range from P90, 250 mmbbls, P50, 950 mmbbls to P10, 2,500 mmbbls

SNE (Sangomar) - Early Albian sandy pro-delta turbidite apron and delta-fed ramp

Contingent Oil Updated August 2017:

- 1C = 346 mmbbls
- 2C = 563 mmbbls
- 3C = 998 mmbbls

SNE (Sangomar) = the world's largest oil discovery in 2014

Greater Tortue complex

Seismic courtesy of TGS

- Tortue-1 found 117 m of net gas pay in excellent poro-perm Cenomanian & Albian reservoirs
- Slope/channel reservoirs in structural /stratigraphic trap
- 25 TCF

Tortue-1
(5100m)



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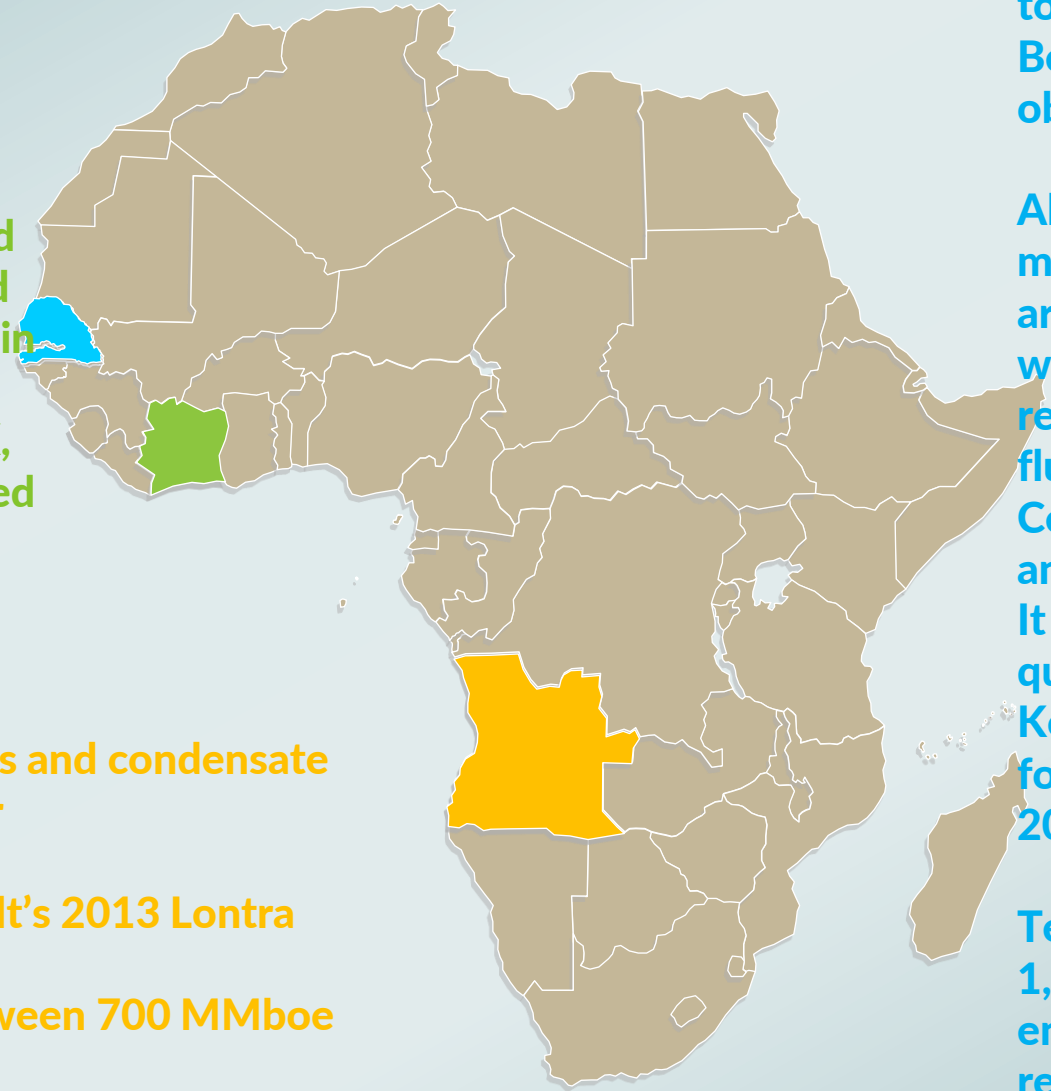
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Tortue = the world's largest thermogenic gas discovery in 2015

Zohr = the world's largest gas discovery in 2015

2016 Discoveries in Africa



Cote D'Ivoire

In offshore blocks CI-527 and CI-528, Anadarko's Pelican-1X well (along trend to Paon) intersected around 70 ft (21.3 m) of net oil pay in two separate intervals. Another well, Rossignol-1X, on block CI-528 encountered well-developed sands and roughly 15 ft (4.6 m) of net oil pay on water.

Angola

Zalophus 1 encountered gas and condensate Located in 1,800m of water TD of 5,170m 10 km south-west of Colbalt's 2013 Lontra discovery Resource estimated of between 700 MMboe and 1.1 Bboe.

Senegal

BEL-1 well in 1,031 m (3,382 ft) of water to a TVD of 2,767 m (9,078 ft). The well intersected two good-quality gas-bearing sand reservoirs with total net thickness of 8 m (26 ft) between the Bellatrix main objective and deeper SNE appraisal objective.

Ahmeyim-2 was drilled 5 km northwest and 200 m downdip of the Tortue-1 discovery well in around 2,800 m of water, to a TD of 5,200 m. The well confirmed significant thickening of the gross reservoir sequences down-structure and static fluid pressure communication within the lower Cenomanian between Ahmeyim-2, Tortue-1, and Guembeul-1.

It delivered 78 m of net gas pay in two high-quality reservoirs in the Albian and Cenomanian. Kosmos raised its Pmean gross resource estimate for the Tortue structure from 17 tcf to more than 20 tcf.

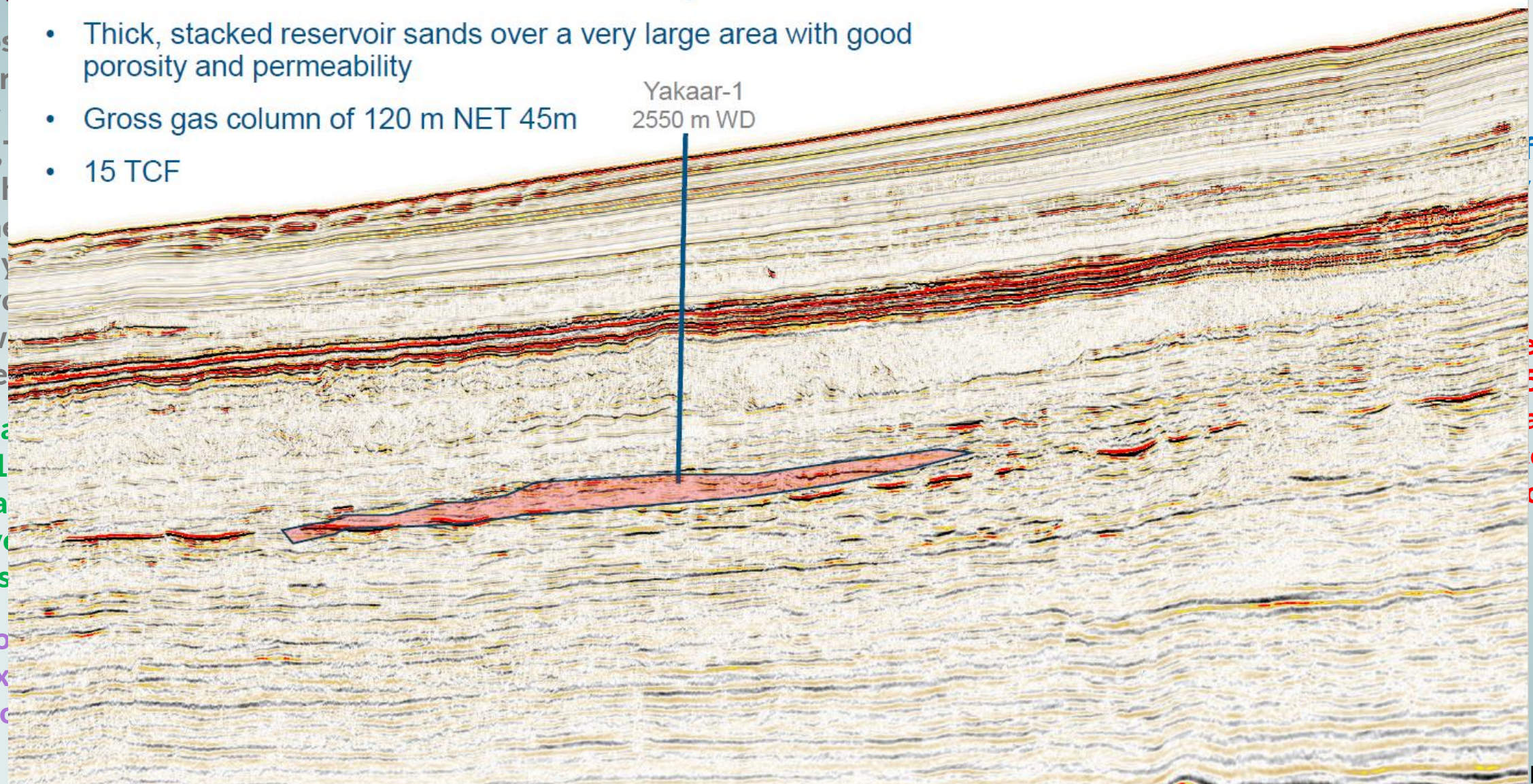
Terranga-1 exploration well in water depths of 1,800m; drilled to a TD of 4,485m and encountered 31m of net gas pay in good quality reservoir in the Lower Cenomanian objective

Yakaar-1

Seismic courtesy of TGS

- Stacked Lower Cenomanian basin floor fairways fans
- Thick, stacked reservoir sands over a very large area with good porosity and permeability
- Gross gas column of 120 m NET 45m
- 15 TCF

Yakaar-1
2550 m WD



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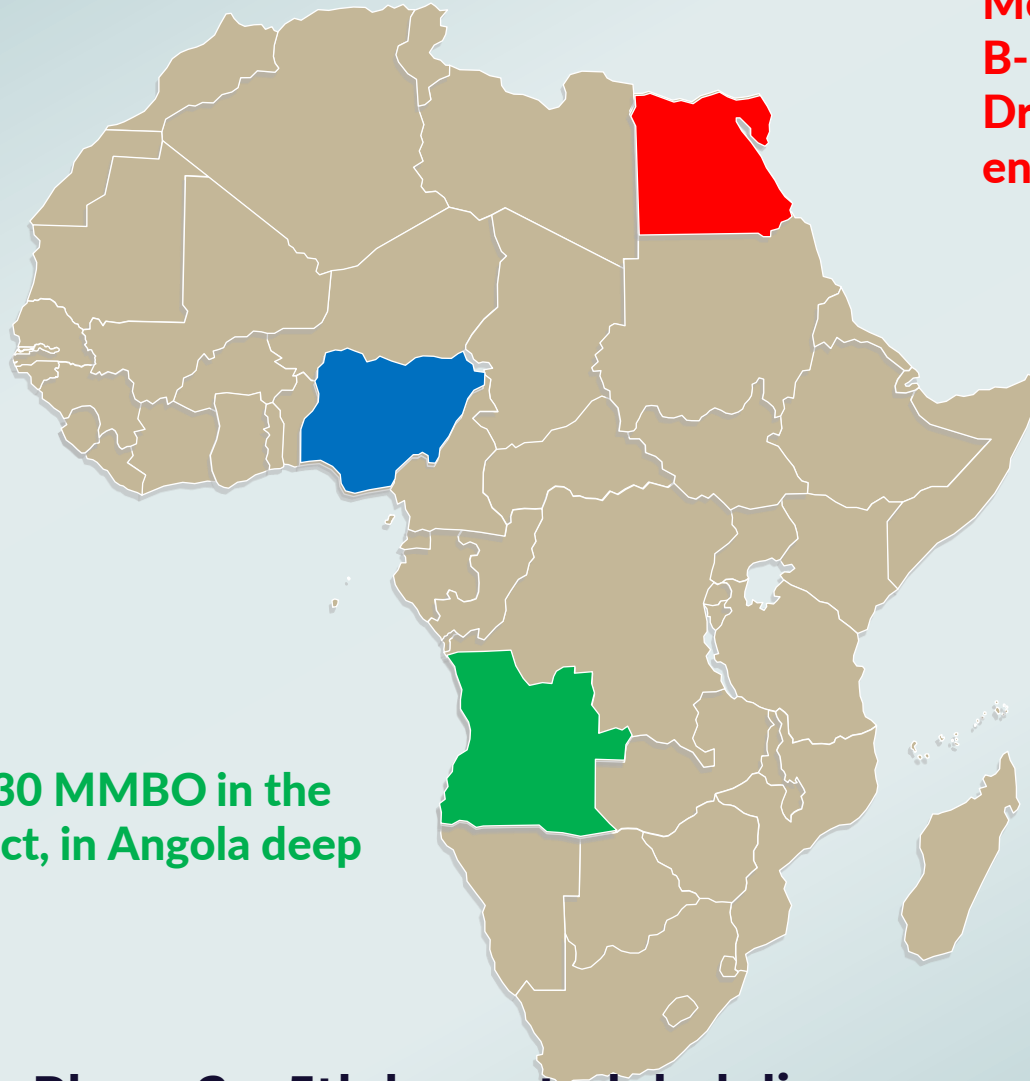
Yakaar = the world's largest gas discovery in 2017

front of
worldwide discoveries with 27% of volumes

2018 Discoveries in Africa

Nigeria - Erin Energy discovered the Oyo field discovered hydrocarbons(28 MMboe) in the Miocene formation. The well is located about 9.5 km northwest of the Oyo Central field 120 offshore Nigeria

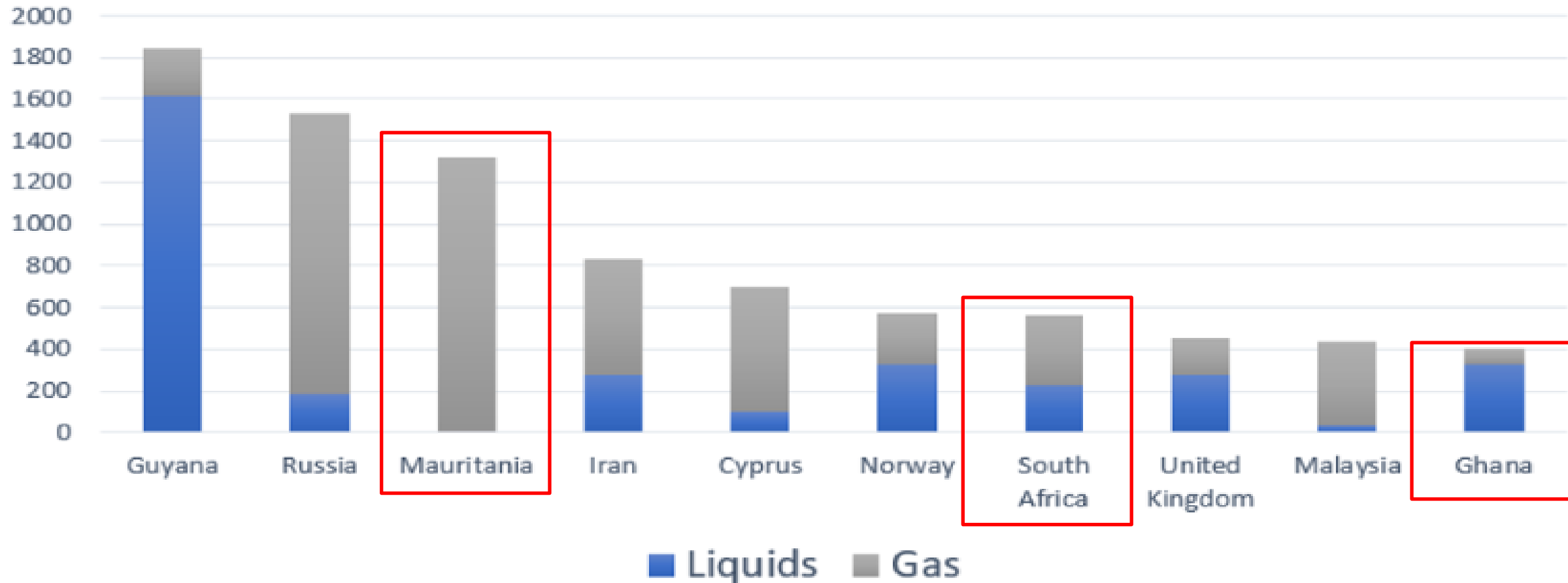
Angola - Block 15/06 - 130 MMBO in the Agogo exploration prospect, in Angola deep water.



Meleiha Phase 2 - (190 MMBO) -SWM B-1X Exploration Prospect Drilled to a TD of 4,523 meters, encountering 35 meters of light oil.

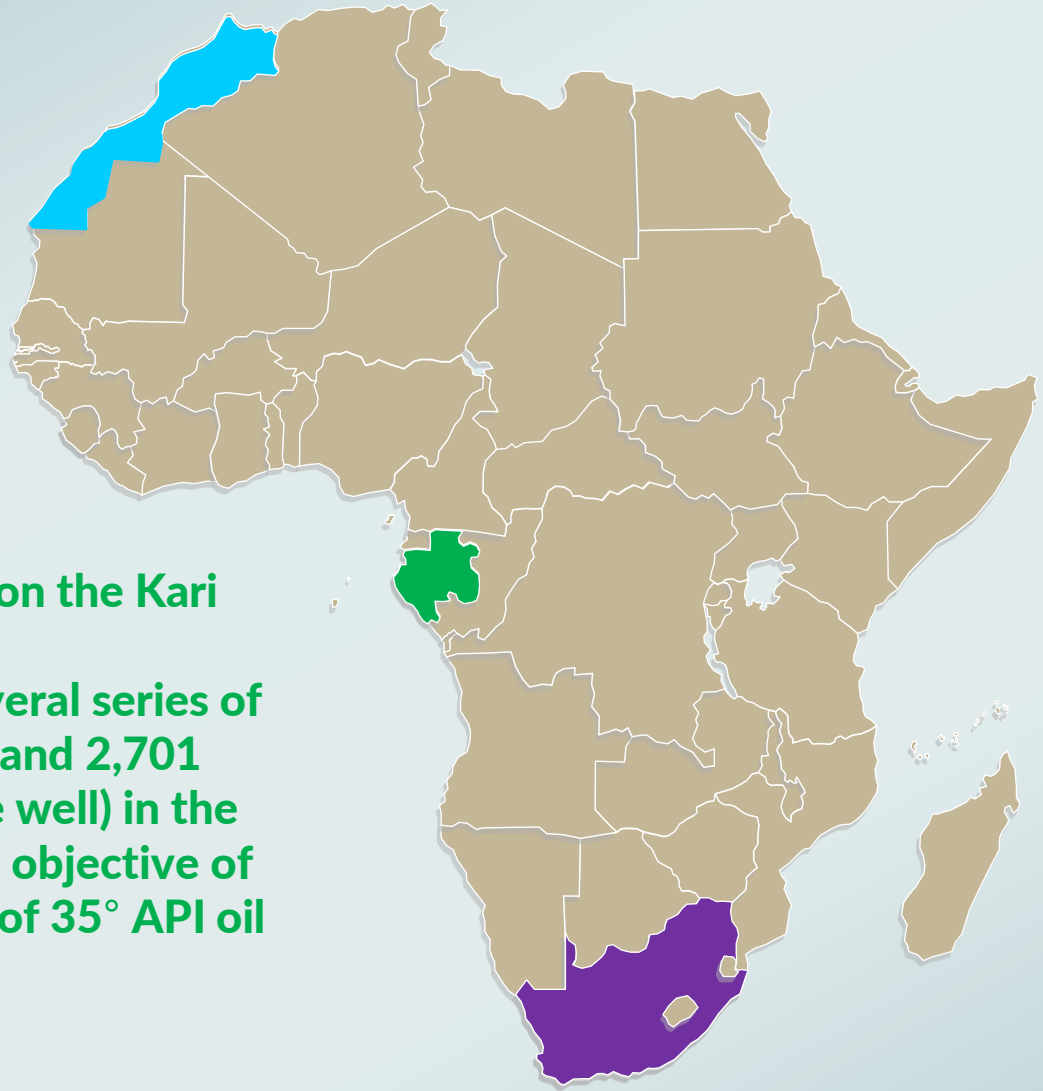
Meleiha Phase 2 - 5th largest global discovery of the year

Top ten countries in terms of conventional discovered volumes in 2019. Millions of barrels of oil or equivalent



ExxonMobil led the way in discoveries in 2019 thanks to new finds in Guyana. RYSTAD ENERGY

2020 Discoveries in Africa



SDX Makes Commercial Gas Discovery with Morocco's BMK-1 Well

Kama-1 exploration well on the Kari licence in south Gabon. The well encountered several series of oil shows between 1,865 and 2,701 metres (total depth of the well) in the Kissenda formation, main objective of the drilling, and a sample of 35° API oil has been collected.

Total made a significant gas condensate discovery on the Luiperd prospect, located on Block 11B/12B in the Outeniqua Basin.

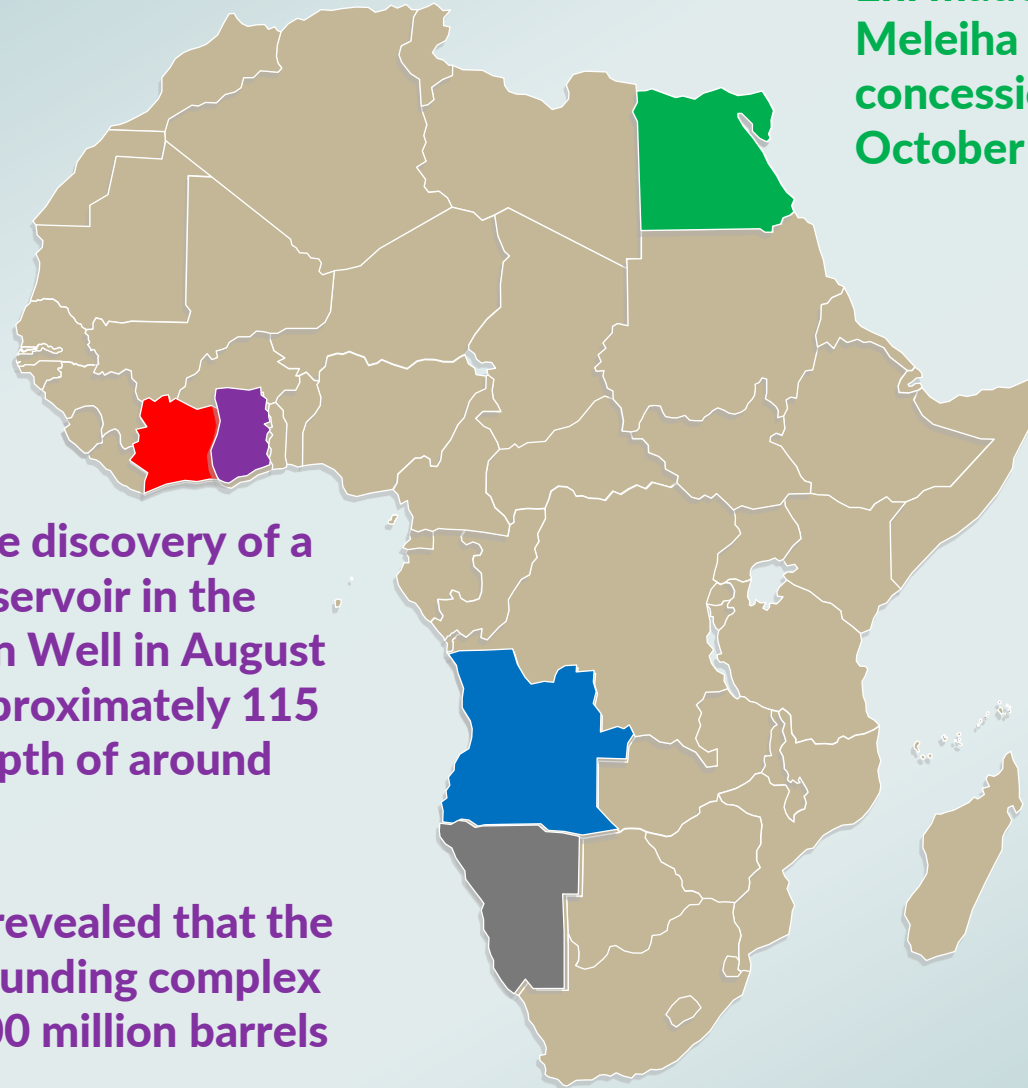
Luiperd well drilled to a total depth of about 3,400 meters and encountered 73 meters of net gas condensate pay in well-developed good quality Lower Cretaceous reservoirs

2021 Discoveries in Africa

Baleine-1X well was the first exploration well drilled by the E&P company in Ivory Coast. Preliminary estimates place the discovery between 1.5 and 2 billion barrels of oil and between 1.8 and 2.4 tcf of associated gas.

BW Energy, announced the discovery of a 13.5 meters oil-bearing reservoir in the Hibiscus North Exploration Well in August 2021. Water depths of approximately 115 meters and with a total depth of around 3,500 meters.

Eni in CTP Block 4 in July revealed that the Eban-1X well and its surrounding complex holds between 500 and 700 million barrels of oil equivalent.



Egypt
Jasmine W-1X, Jasmine MWD-21 and SWM Meleiha-4X Wells
Eni made three oil and gas discoveries in the Meleiha and South West Meleiha (SWM) concessions in Egypt's Western Desert in October 2021.

Eni announced that the drilling of the Cuica-1 NFW well on the Cuica exploration prospect in Block 15/06, offshore Angola, has resulted in a new light oil discovery

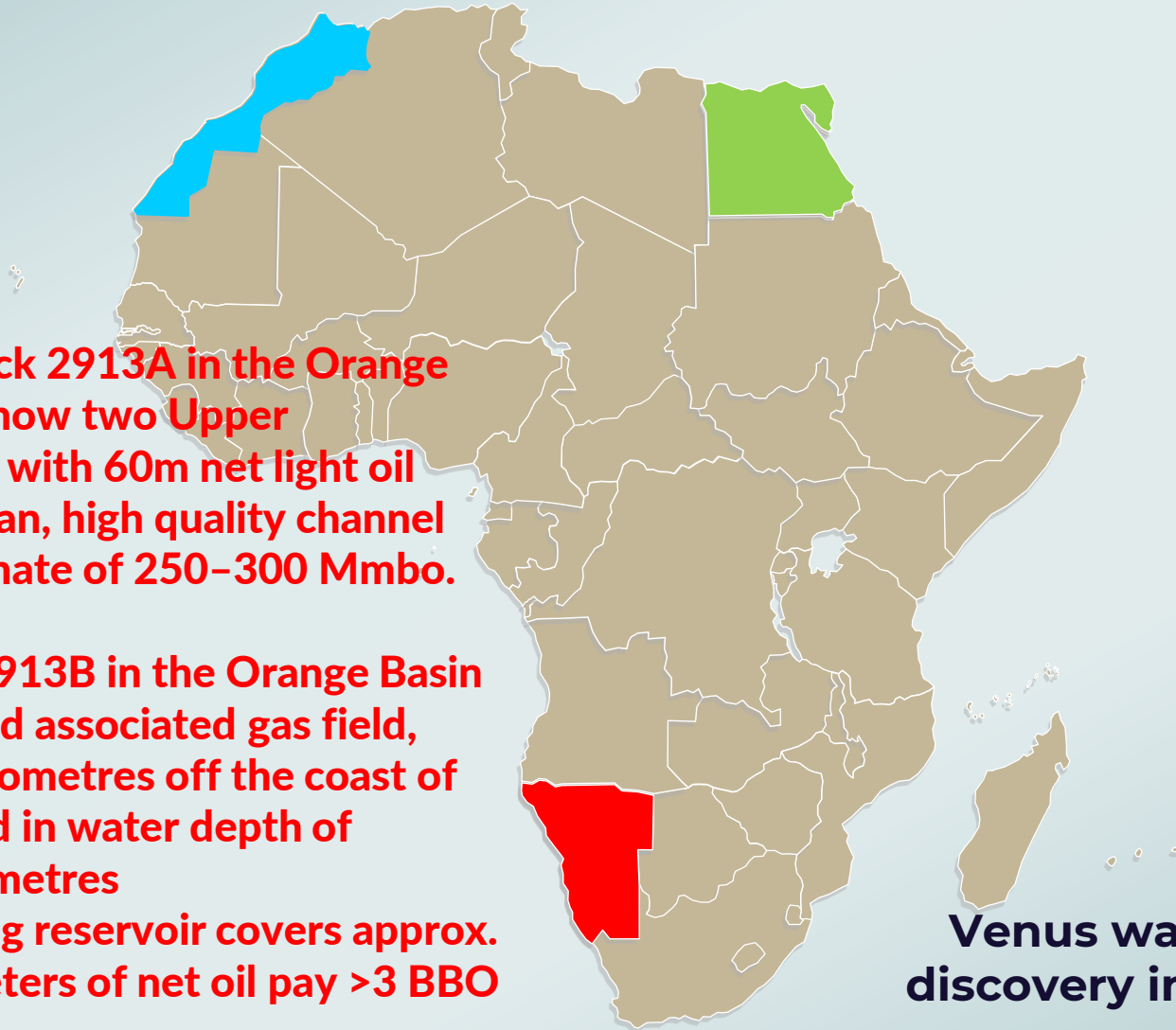
Namibia
ReconAfrica, uncovered the potential of a massive oil discovery estimated to contain 120 billion?

2022 Discoveries in Africa

Morocco
Chariot
Anchois-2
100m net-gas pay

Graff-1 located in Block 2913A in the Orange Basin - Well results show two Upper Cretaceous reservoirs with 60m net light oil column in the Santonian, high quality channel sands. Resource estimate of 250-300 Mmbo.

**Venus-1 well, Block 2913B in the Orange Basin world class light oil and associated gas field, approximately 290 kilometres off the coast of southern Namibia, and in water depth of approximately 3,000 metres
The oil and gas-bearing reservoir covers approx. 600 sq.km with 84 meters of net oil pay >3 BBO recoverable**



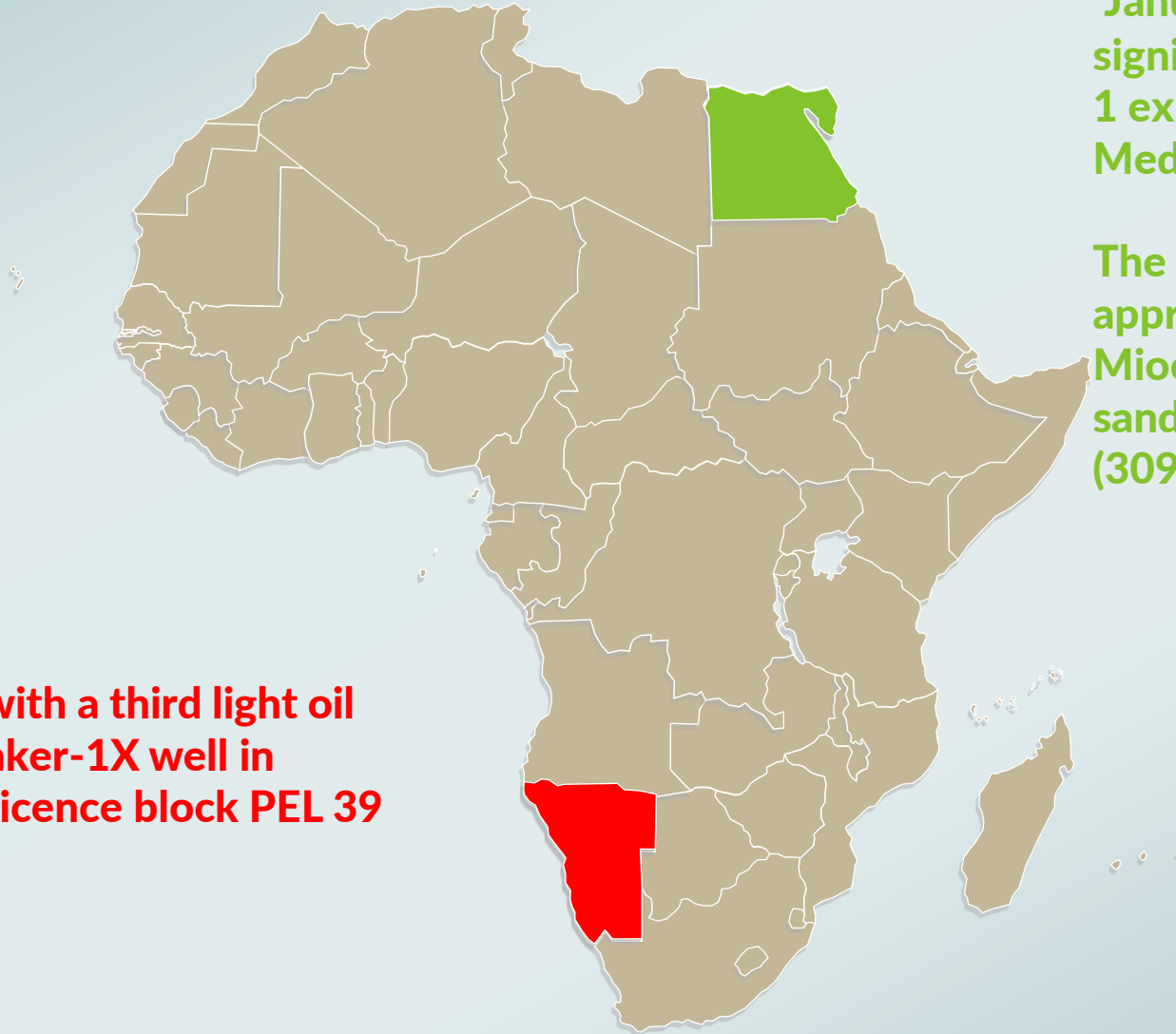
Nada E Deep 1X, Meleiha SE Deep 1X and Emry Deep 21 Wells
In April 2022, Eni made three oil and gas discoveries within its Meleiha concession in Egypt, boosting the region's production capacity by approximately 8,500 barrels per day (bpd) of oil equivalent.

Eni's discoveries include the:

- Nada E Deep 1 X well, encountering 60 meters of net hydrocarbon pay;
- Meleiha SE Deep 1X well, leading to the discovery of 30 meters of net hydrocarbon pay; and the
- Emry Deep 21 well, which encountered 35 meters of net hydrocarbon pay.

Venus was the worlds largest play opening discovery in 2022 and Africa's largest ever oil discovery!

2023 to date Discoveries in Africa



January 15, 2023 - Eni announced a significant new gas discovery at the Nargis-1 exploration well located in the Eastern Mediterranean Sea, offshore Egypt.

The Nargis-1 well has encountered approximately 200 net feet (61 m) of Miocene and Oligocene gas bearing sandstones and was drilled in 1,014 feet (309 m) of water

Shell started 2023 with a third light oil discovery at the Jonker-1X well in Namibian offshore licence block PEL 39

Summary of the last 10 years discoveries in Africa...



This year's top global oil discovery: Ogo (Nigeria) 2013

This year's top global gas discovery: Mrong (Tanzania) 2013

SNE (Sangomar) = the world's largest oil discovery in 2014

Tortue = the world's largest thermogenic gas discovery in 2015

Zohr = the world's largest gas discovery in 2015

Yakaar = the world's largest gas discovery in 2017

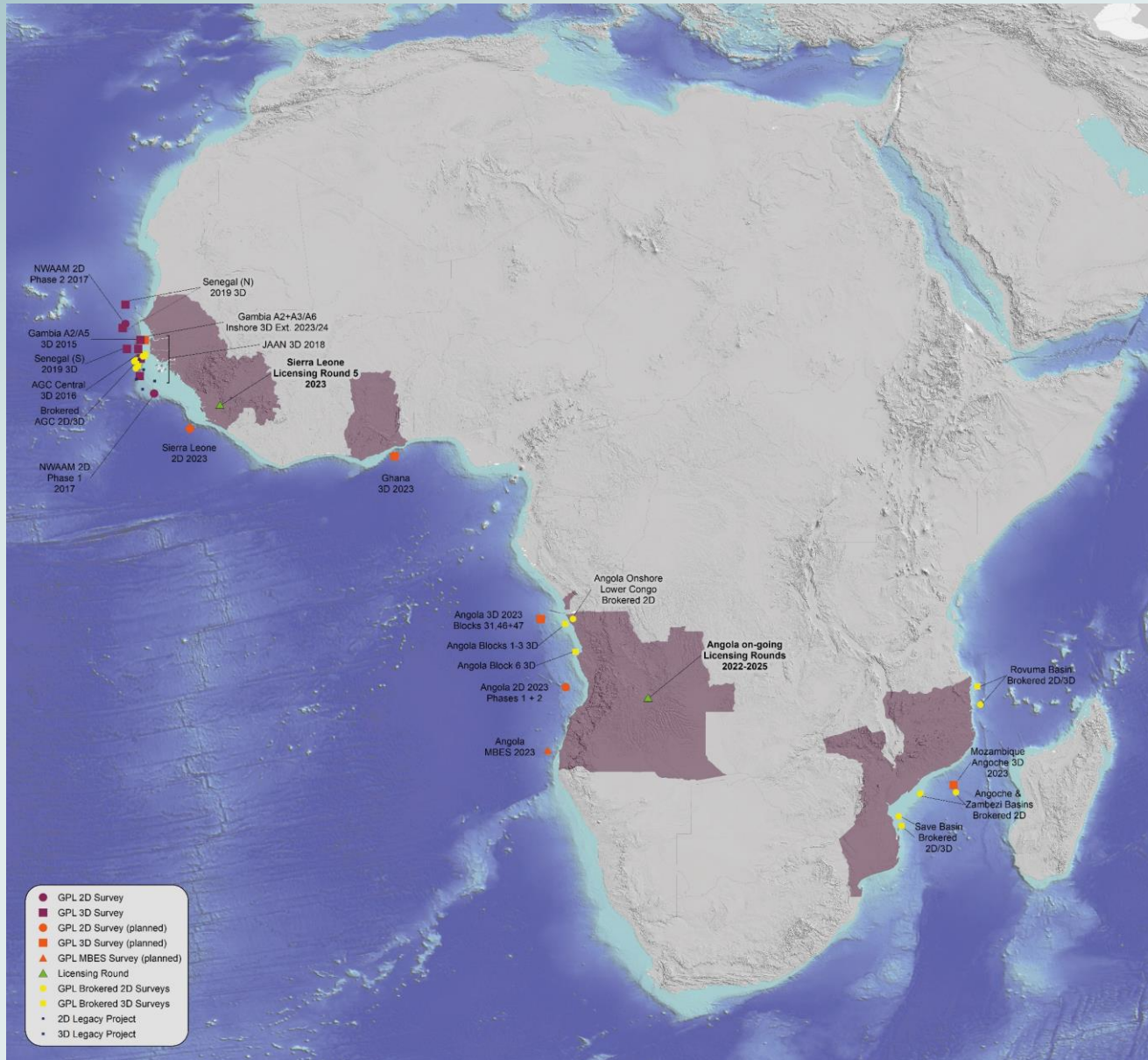
Meleiha Phase 2 - 5th largest global discovery of 2018

Orca - Largest deepwater hydrocarbon discovery in the world in 2019

**Venus was the worlds largest play opening discovery in 2022
and Africa's largest ever oil discovery!**

PART II
– THE SELL
(the next 10 years)

Current Pan-African Activities



Active in 11 countries:

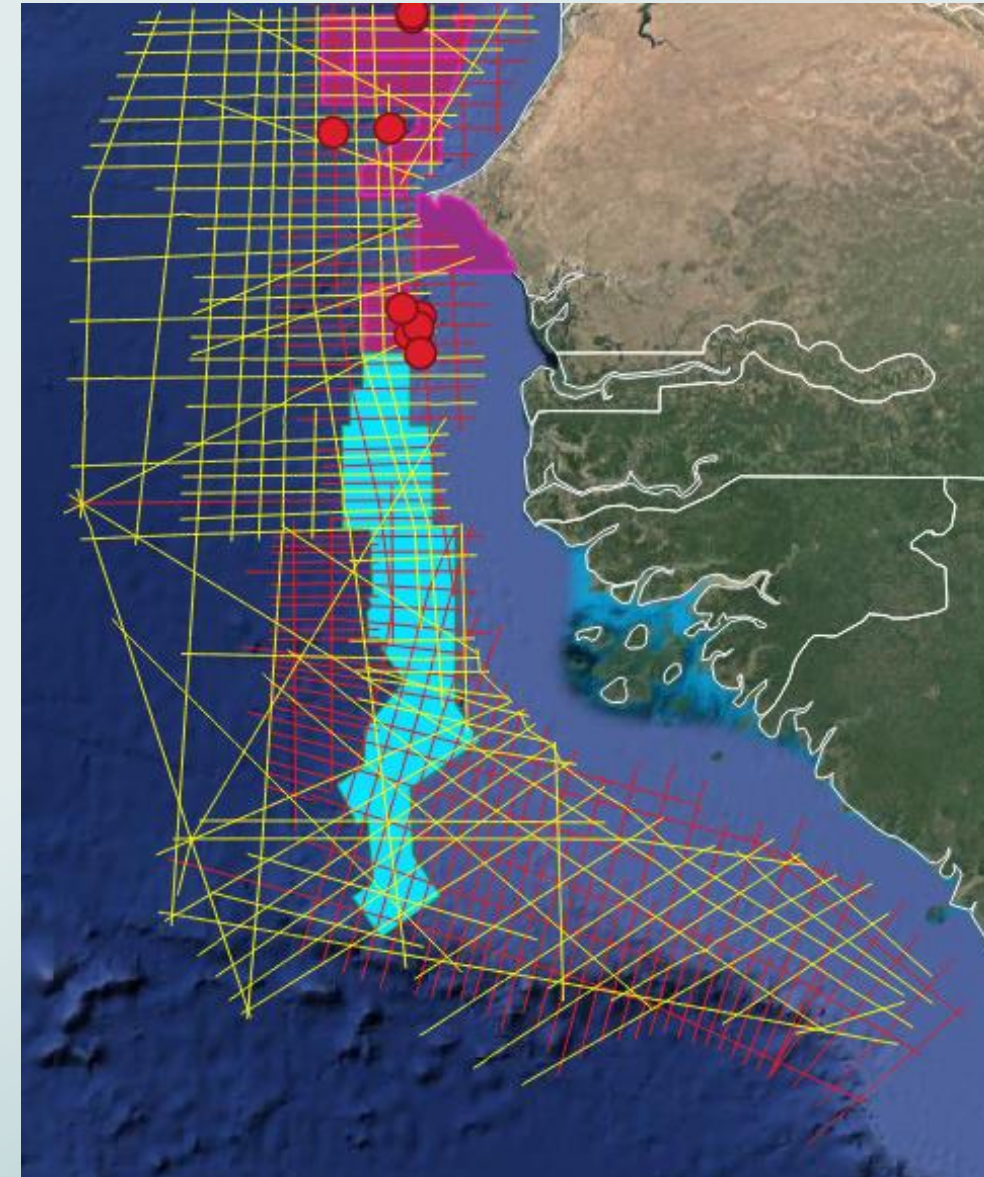
- Ongoing License Round support
- New data acquisition
- Data brokering
- Legacy data reprocessing and merging

SNE (Sangomar) = the world's largest oil discovery in 2014
Tortue = the world's largest thermogenic gas discovery in 2015
Yakaar = the world's largest gas discovery in 2017

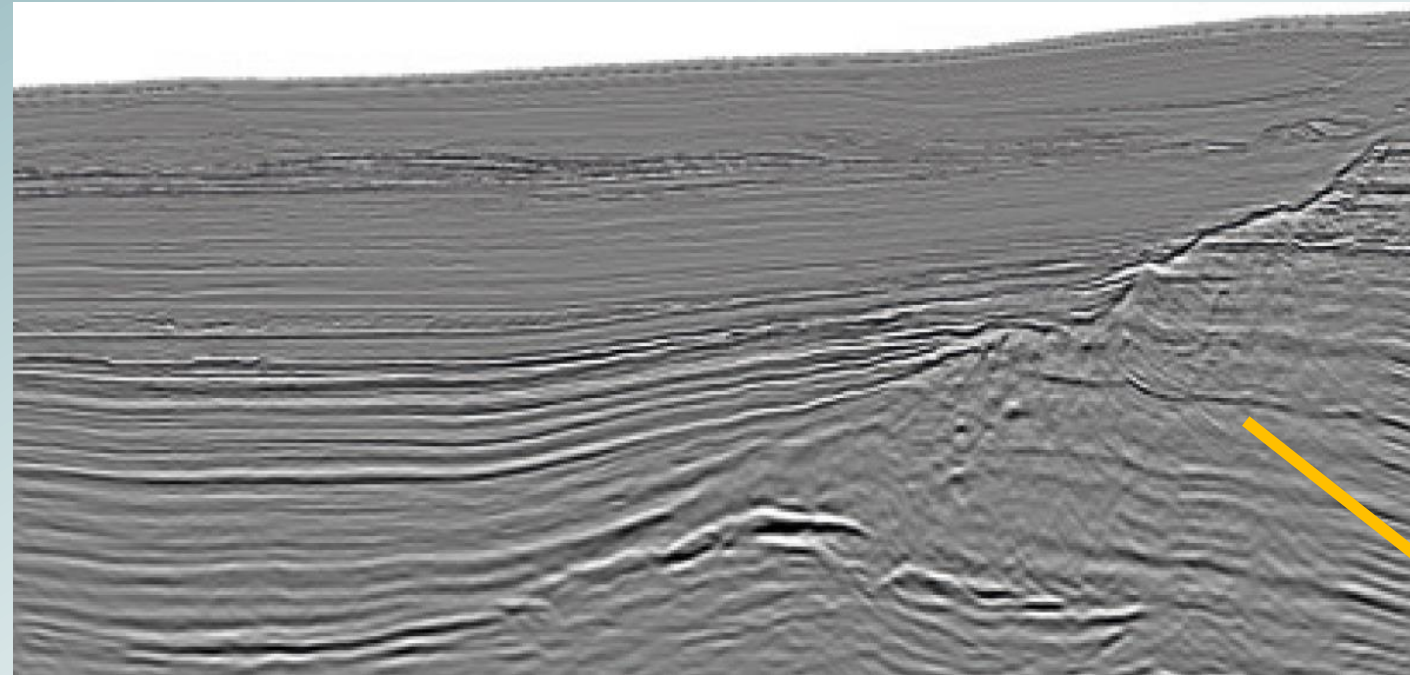
Orca - Largest deepwater hydrocarbon discovery in the world in 2019

Senegal

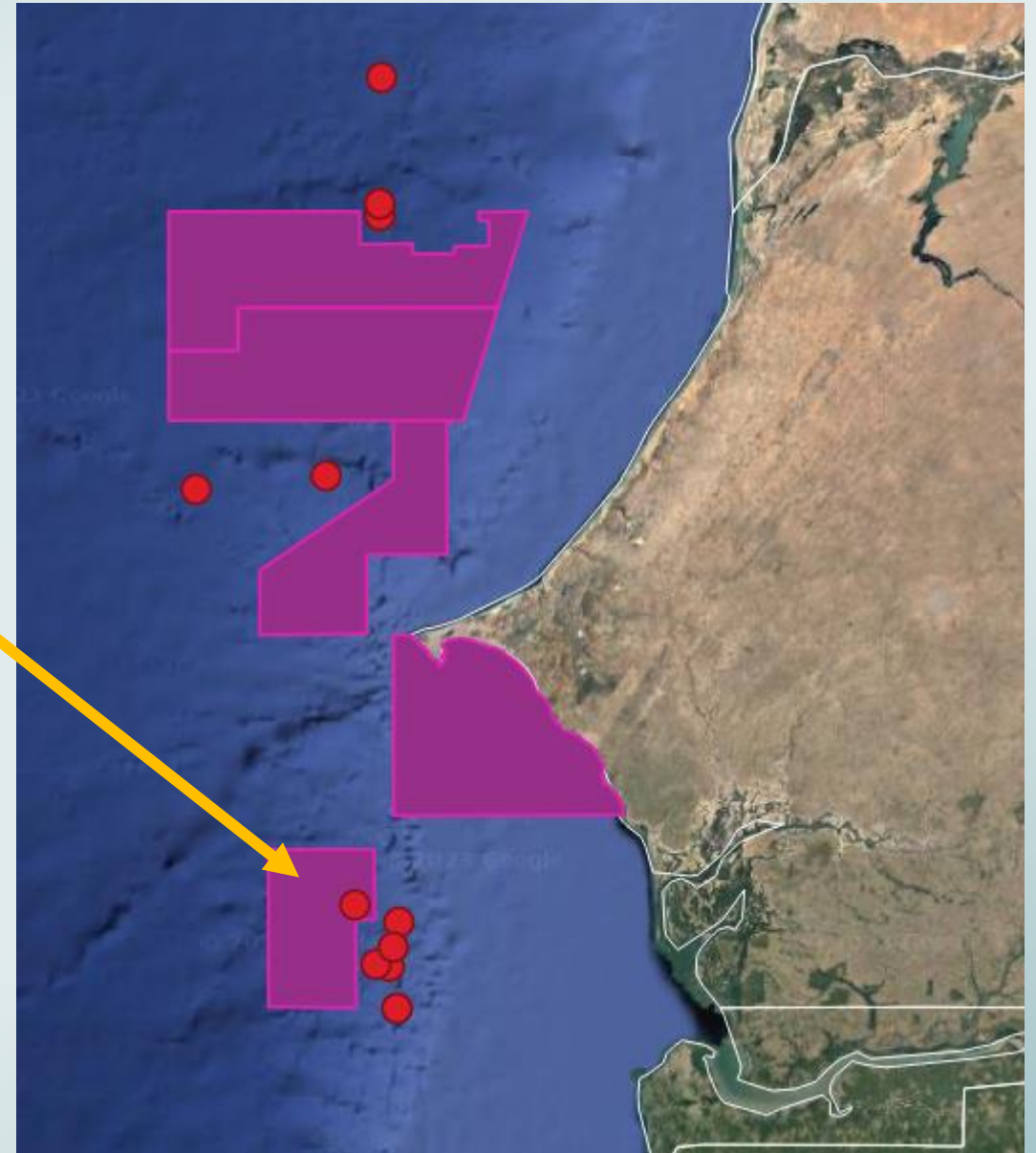
- NWAAM2012
 - 28,000 km of 2D seismic
 - Worked with BOS to permit and acquire, now brokered by TGS
 - Reprocessed to broadband and PSDM in 2018
- NWAAM2017
 - Acquired in partnership with TGS and PGS
 - 24,000 km of MC2D PSTM/PSDM
 - Brokered by TGS
- Jaan
 - Acquired in partnership with TGS and PGS in 2018
 - 28,000 sq.km MC 3D data
 - (re)Processing and Merging of legacy 3D and acquiring 12,000 sq.km of new MC data
- Brokerage of legacy ex-proprietary 3D seismic data
 - Acquired by Block Operators and following discoveries, areas relinquished.



Senegal – 3D Brokerage

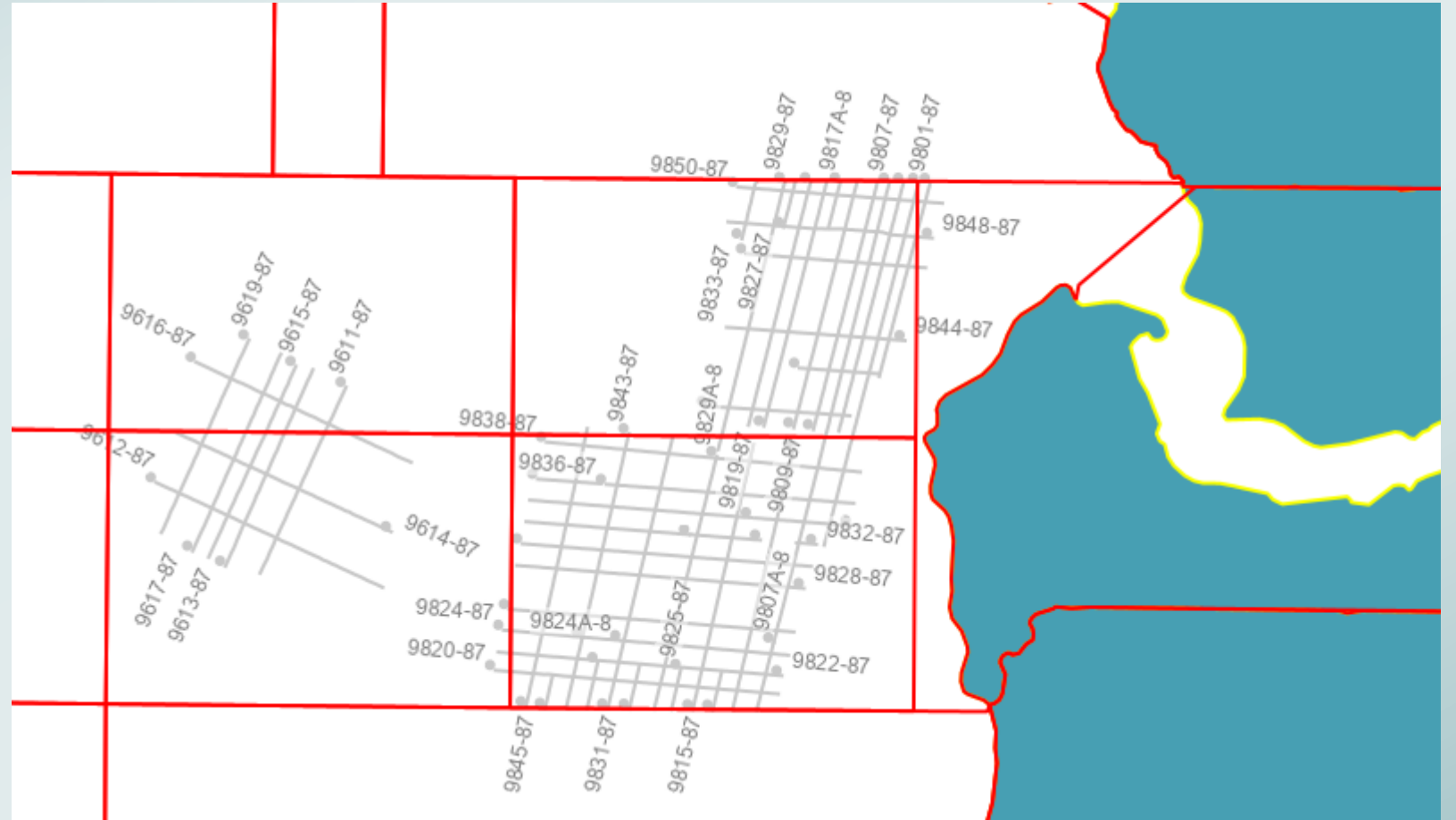


“Over 11,000 sq.km of modern 3D drill-ready MC Seismic”



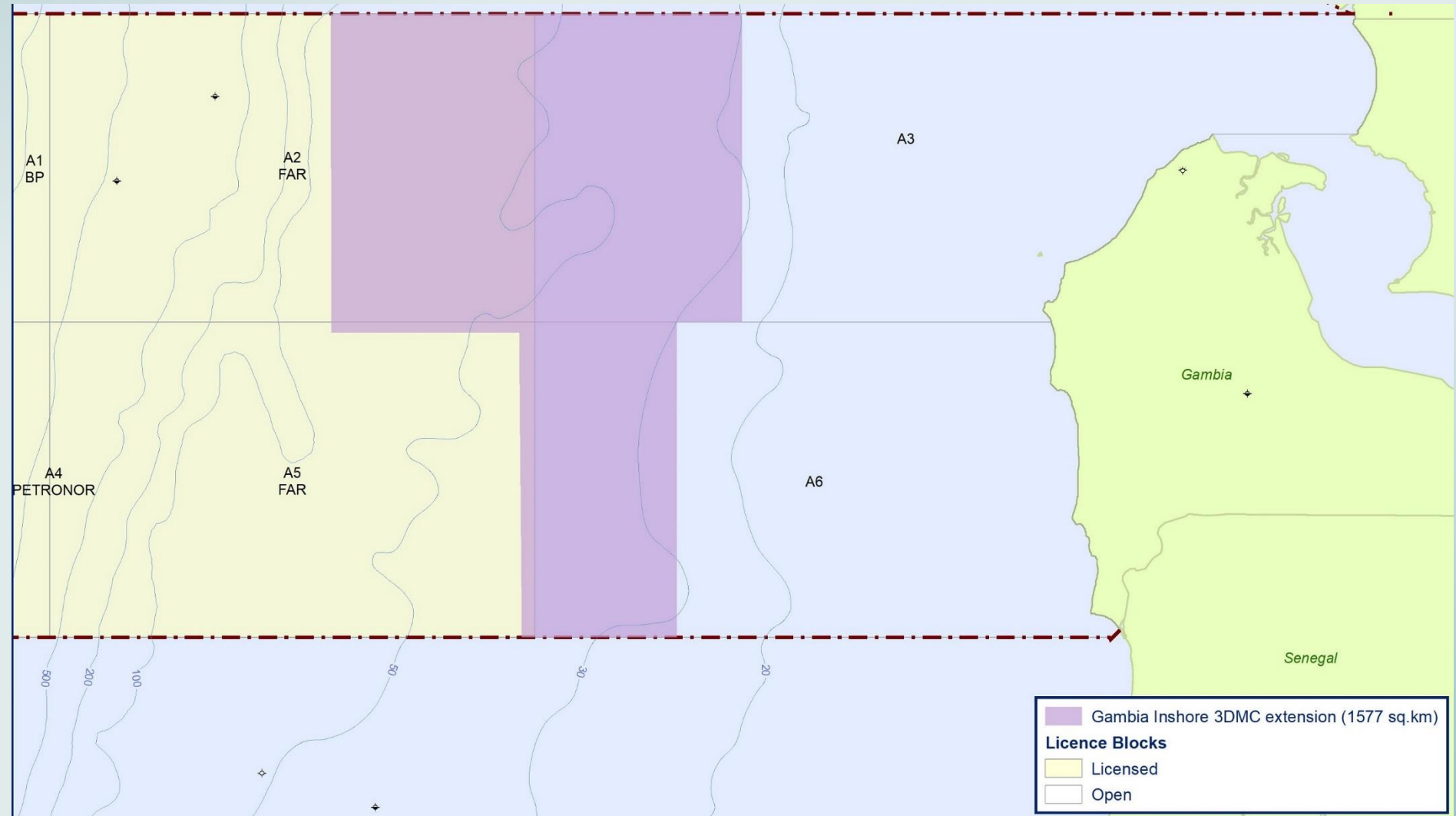
The Gambia

- Despite disappointing wells results in The Gambia over the last few years GeoPartners still see potential in the Shallow water area.
- Brokerage of shallow water 2D data available

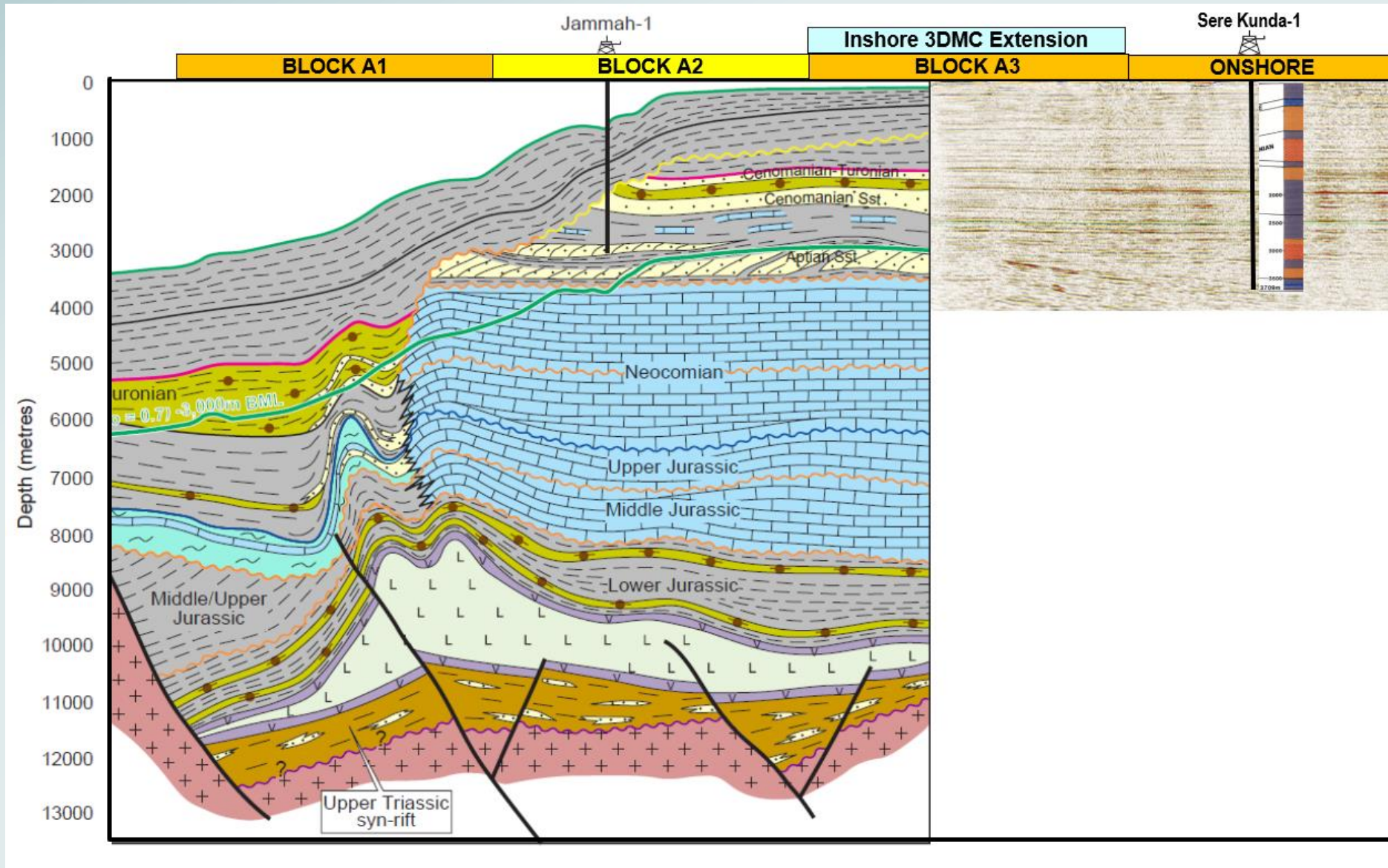


The Gambia

Approx. 1,600 sq. km
Survey in planning

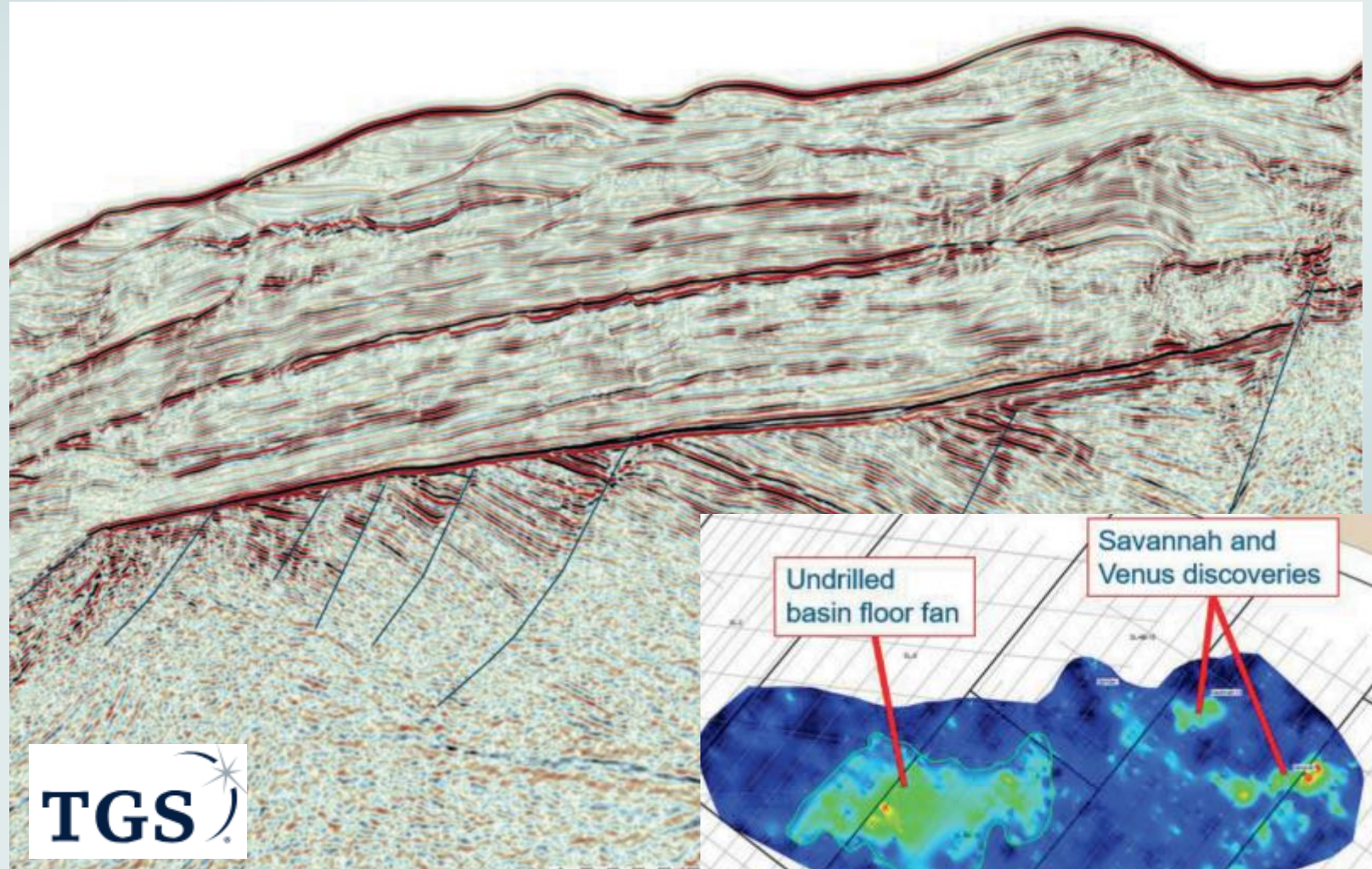


The Gambia



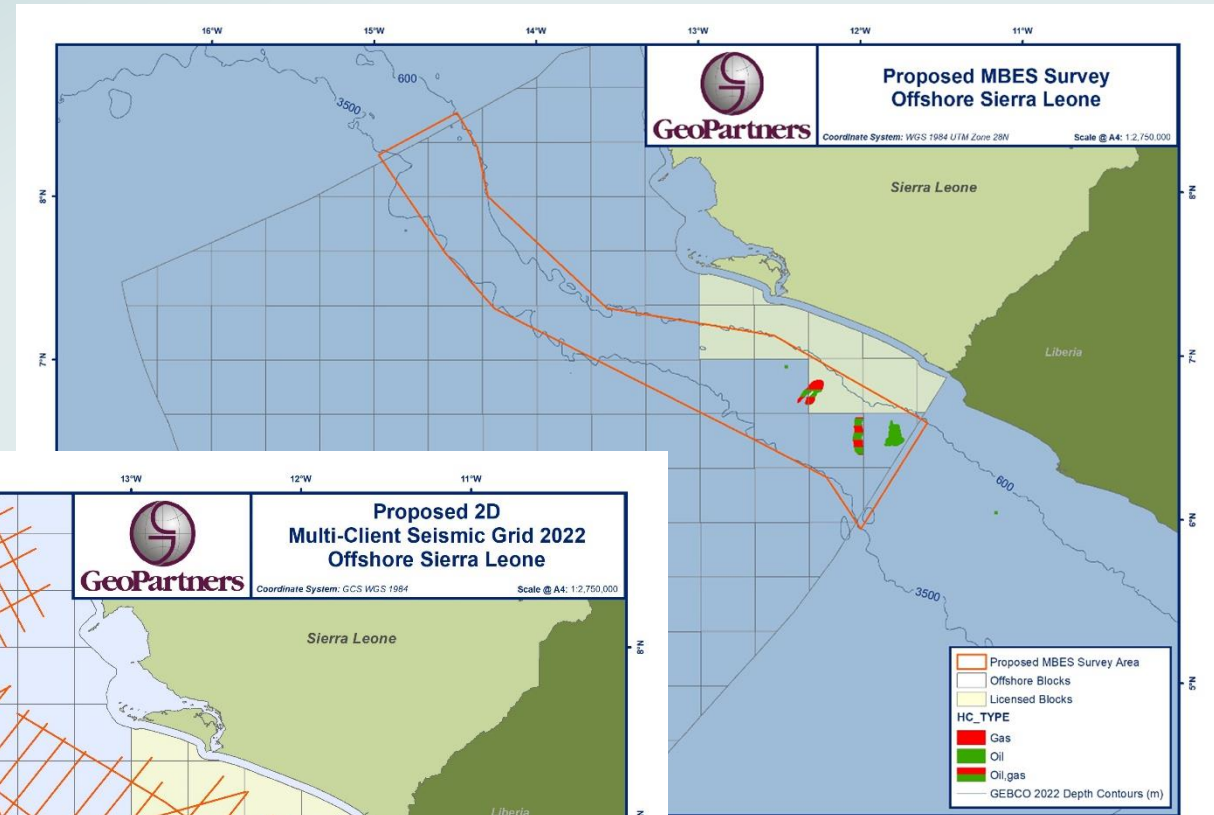
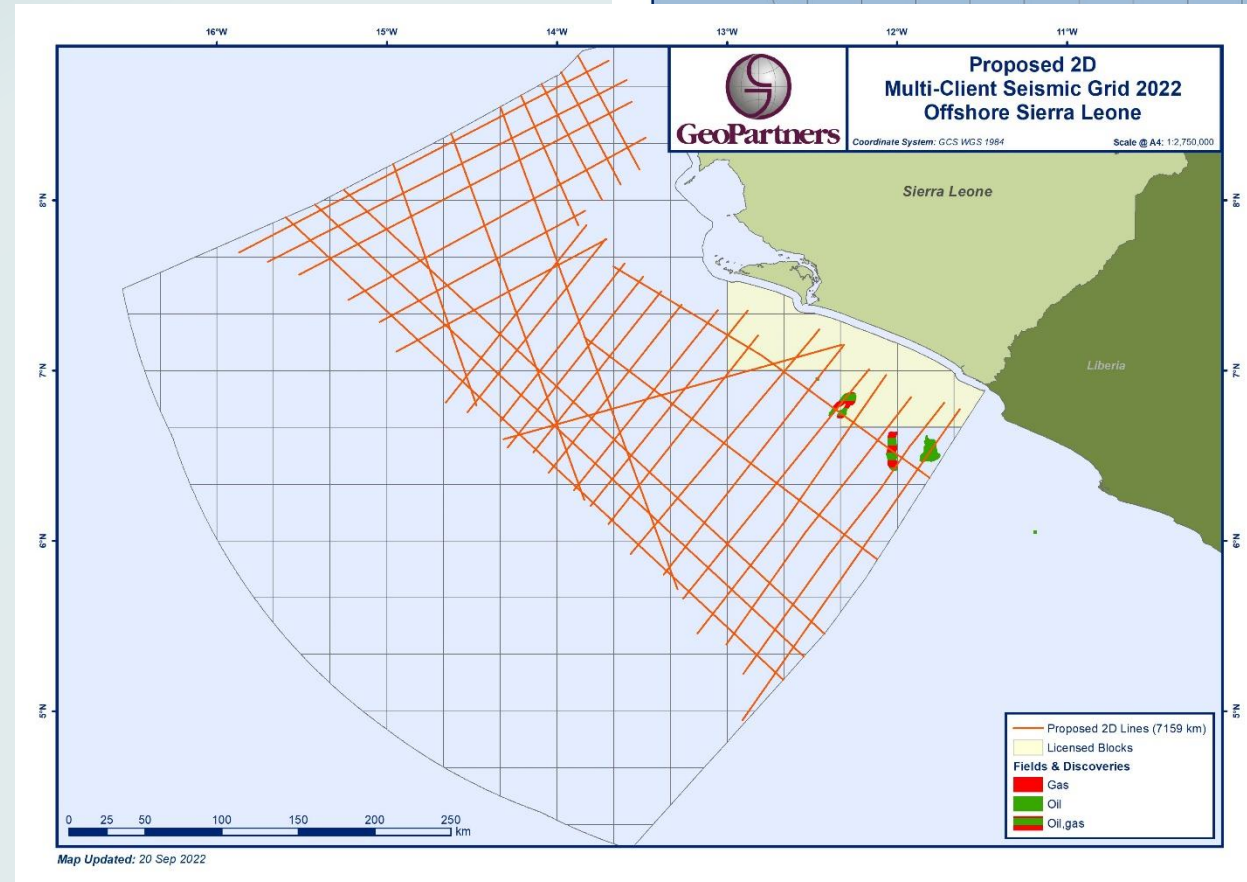
Sierra Leone

- Sierra Leone, which has more than 400 km of Atlantic coastline can be tectonically-reconstructed back to fit with the Guyana Basin.
- Exploration success in Guyana has led to truly world class oil discoveries (15 Bbbls), which should be waiting in their eastern twin in Africa in Sierra Leone



Sierra Leone

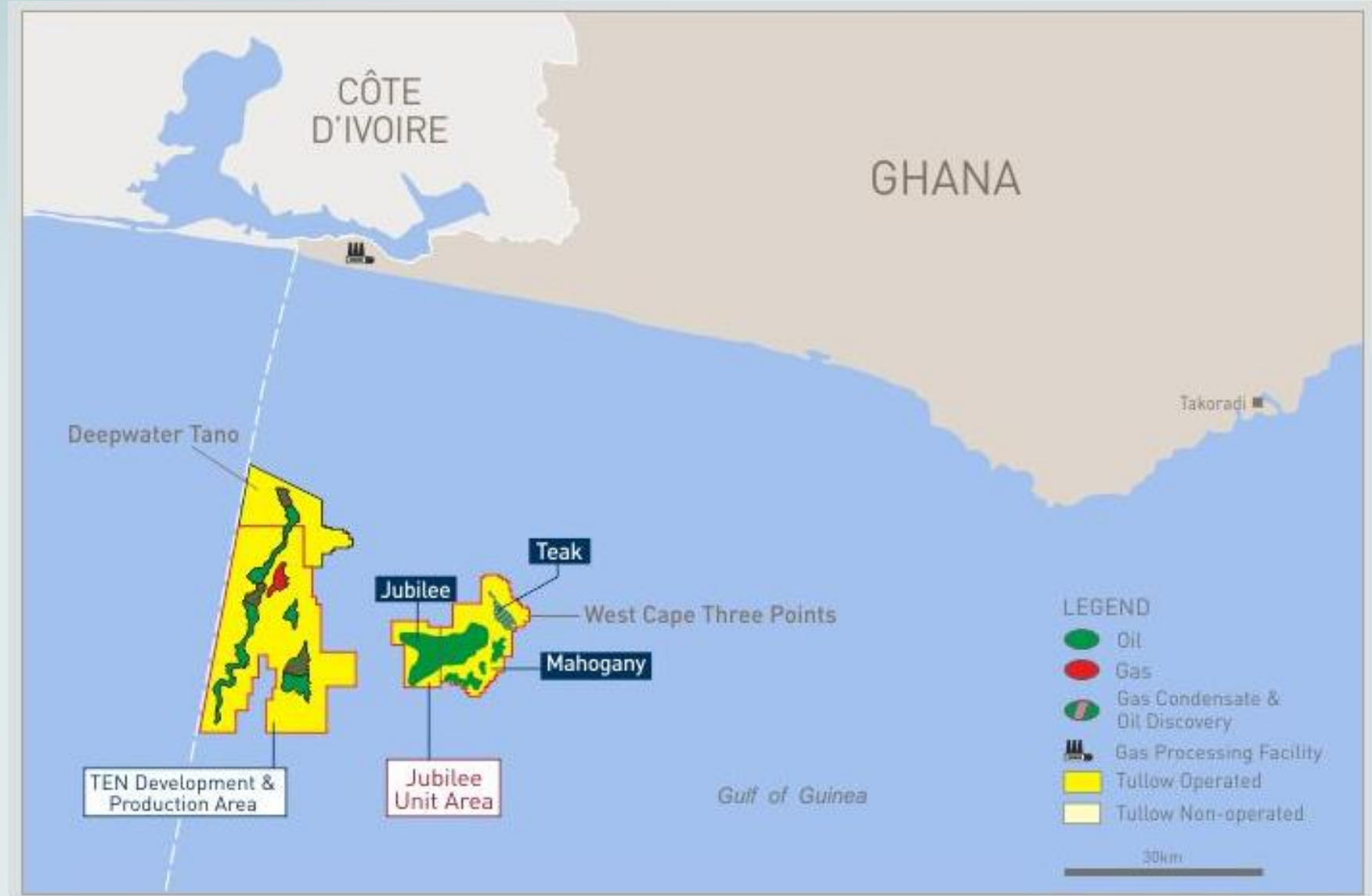
- GeoPartners in partnership with PDSL have 2 projects which we are currently seeking prefunding to begin acquisition in Q4-2023



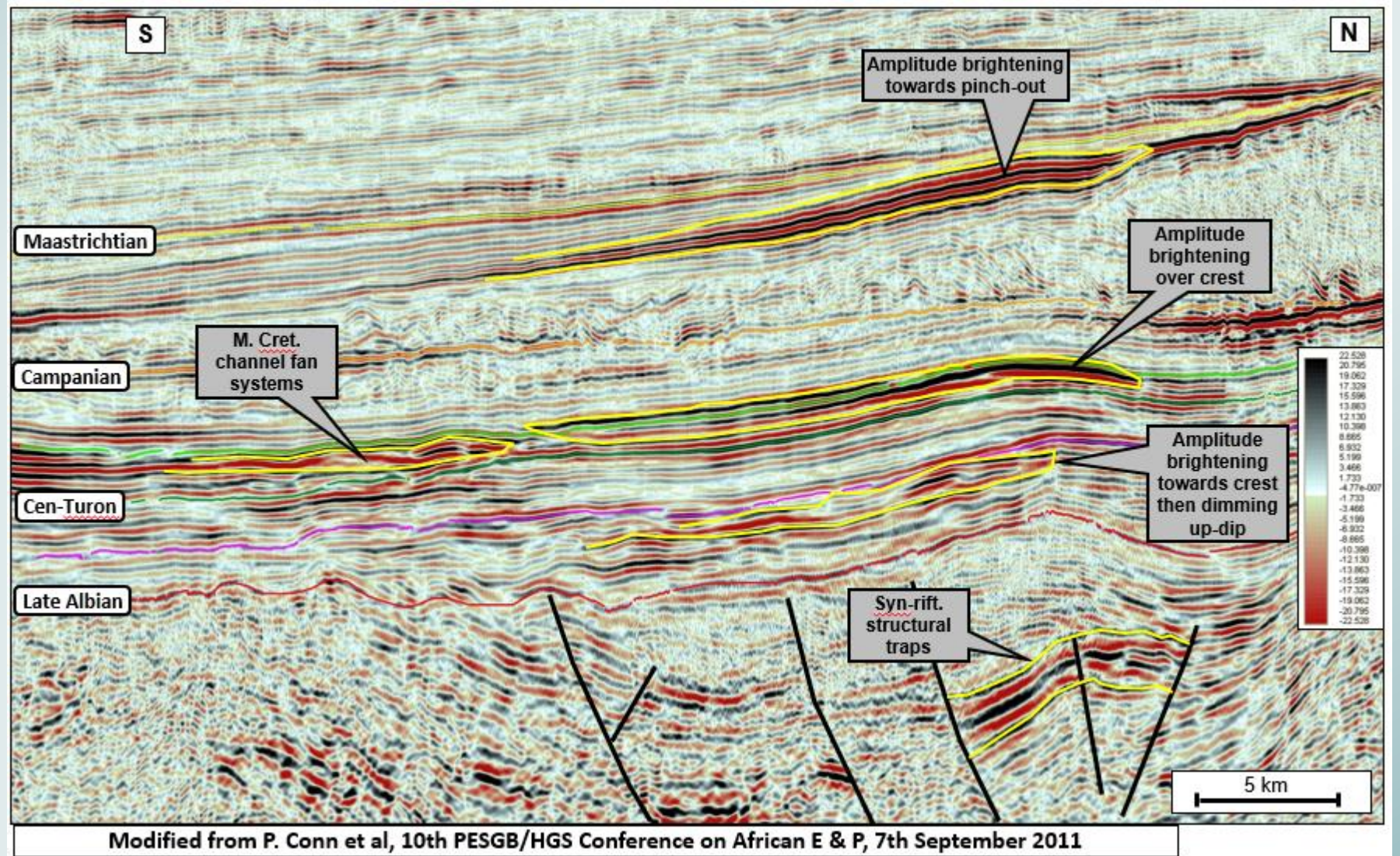
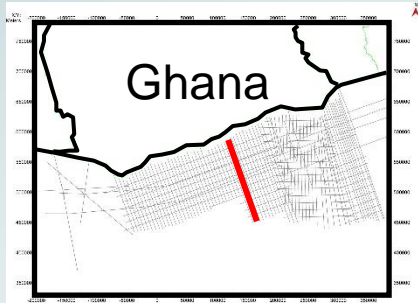
Ghana

2022 and 2023 Production

Net production from the Jubilee field was 31,900 bopd in 2022 and is expected to average around 37,000 bopd in 2023.



Ghana – the underexplored Keta basin



Ghana

Approx 14,000 sq. km

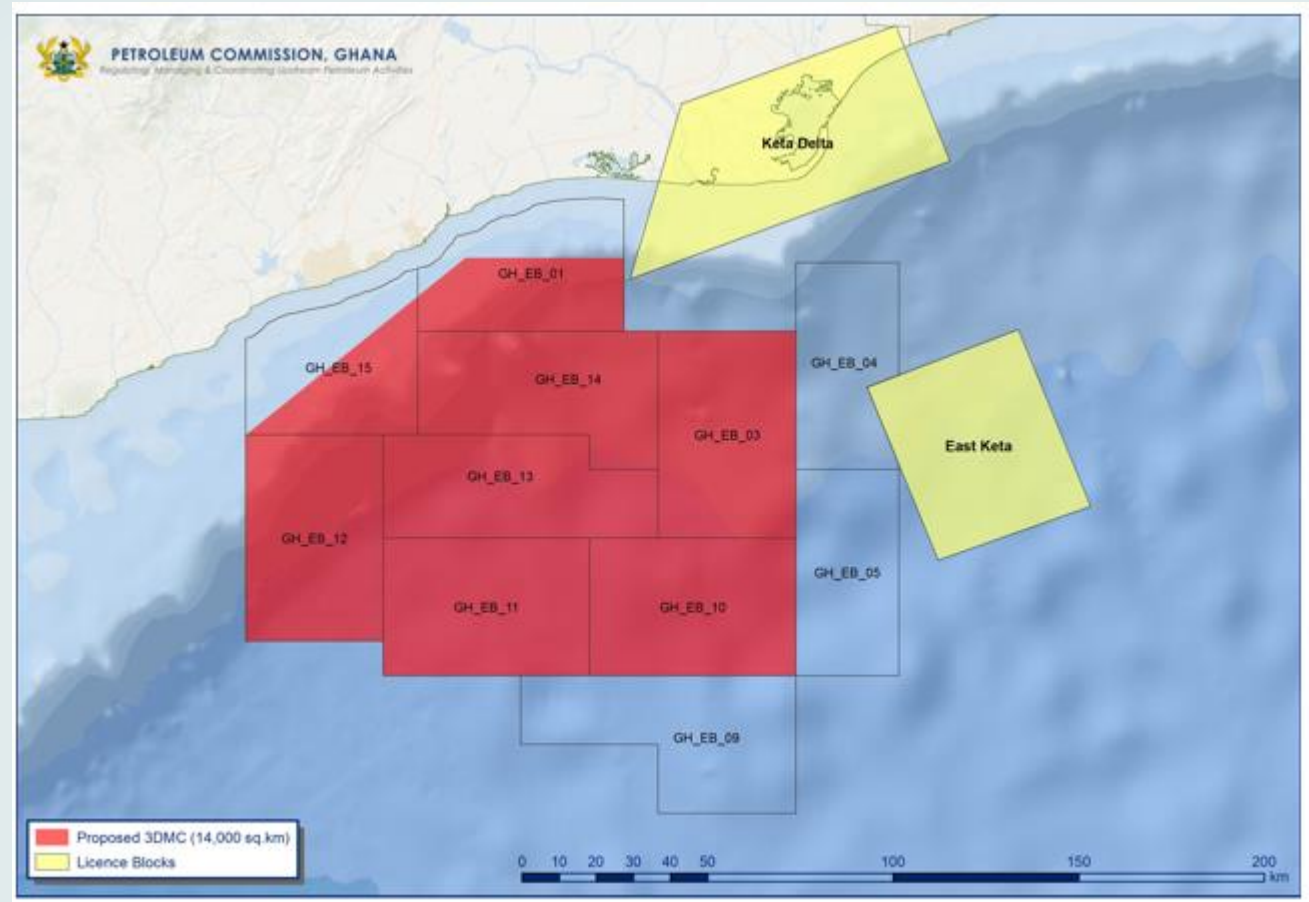
Commencing Q1 2024, with Fast Track deliverables in Q4 2024 and final deliverables in Q2/3 2025

Covers 8 open blocks, available for license negotiation

Water Depths 50 – 3,500m

12 x 112.5m x 8000m streamer configuration in E-W orientation

PreSTM and PreSDM processing deliverables



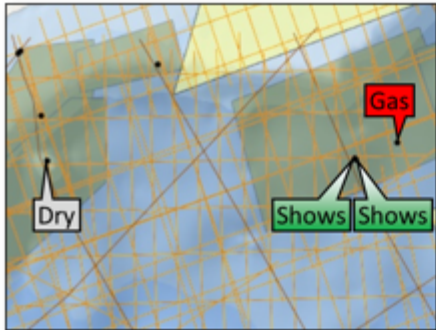
Ghana

#1

Historically under-explored basin:

Only 6 wells drilled on 3D data.

3 out of 4 deepwater wells found HCs.

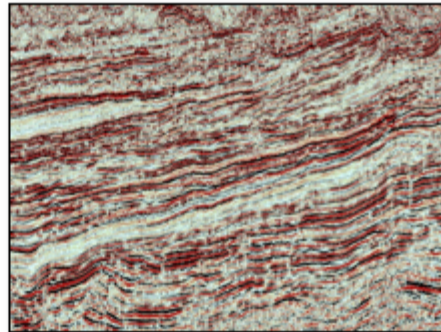


Opportunity:
Re-model deep water using well results

#2

Multiple stacked mass-flow sand systems:

Sand-rich system with stacked units



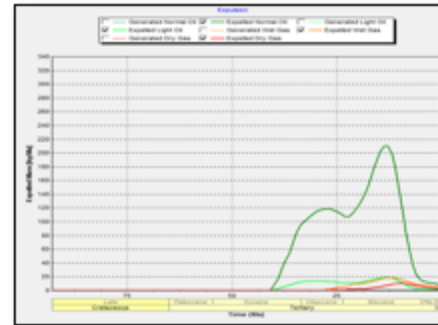
Opportunity:
Drill deepwater with modern 3D data

#3

Source Rocks:

Several mature source rocks across basin.

Miococene expulsion & charge modelled.

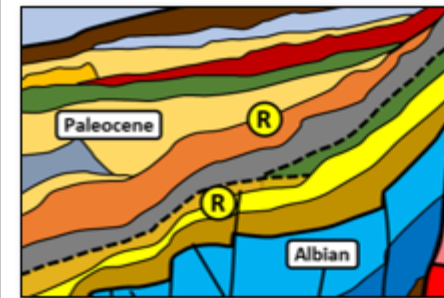


Opportunity:
Reduced risk to charge

#4

Pre-charge inversion forms traps:

Inversion of basin-bounding fault cuts-off sand systems.

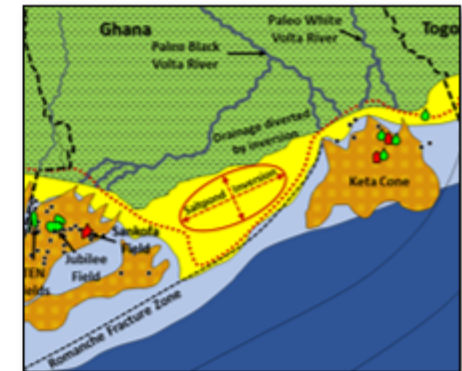


Opportunity:
Reduced risk to trap, especially stratigraphic

#5

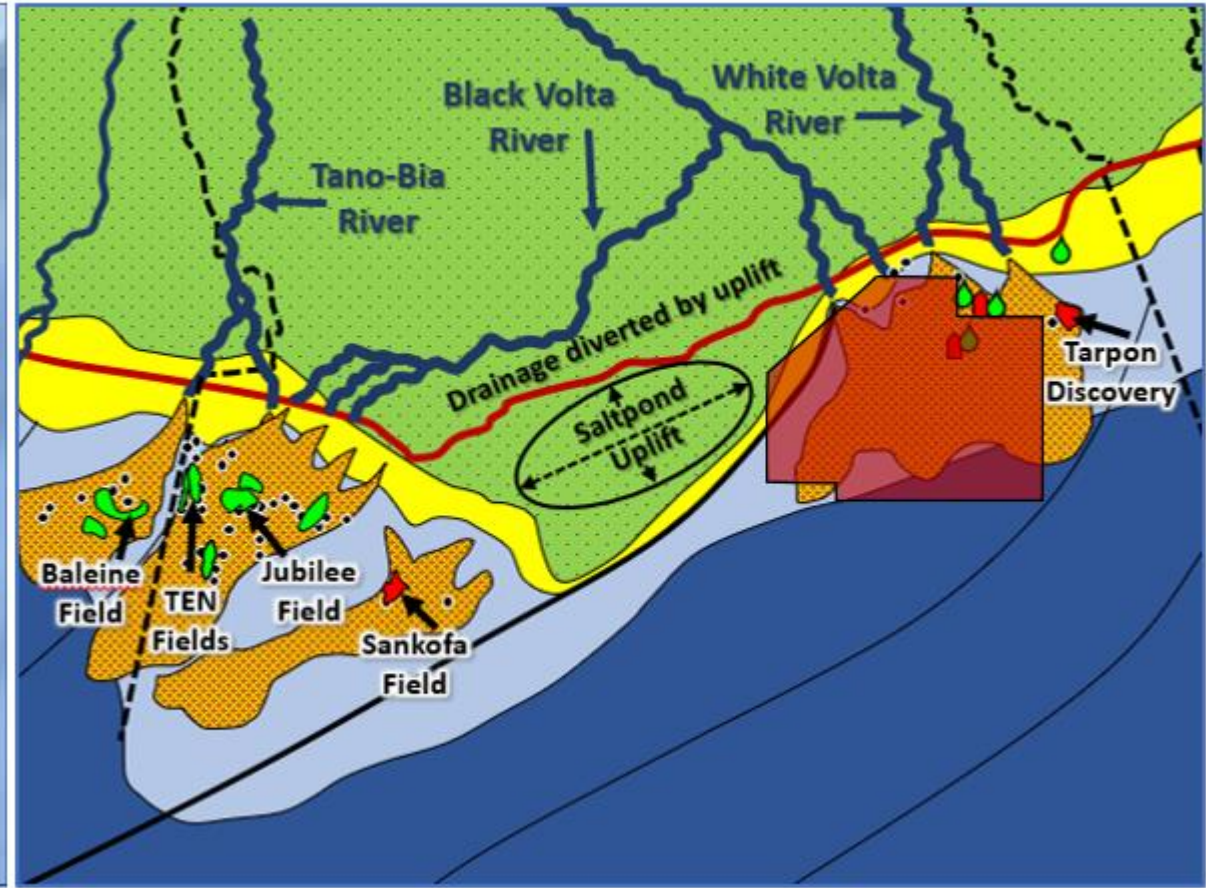
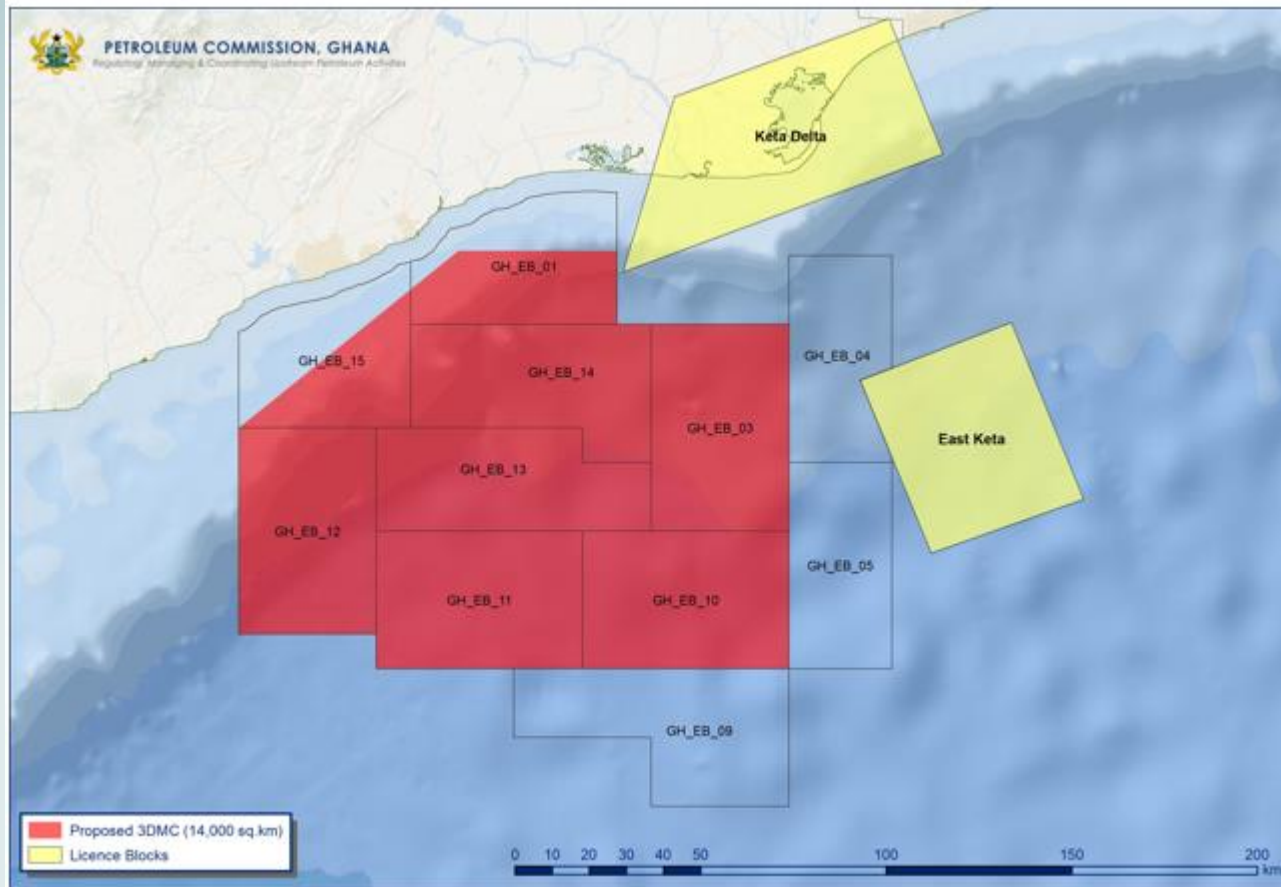
Sand Provenance & Qualities:

Sand provenance indicates excellent reservoir qualities.



Opportunity:
Reservoir qualities likely similar to Tano.

Ghana



Congo

2013

Nene-2 exploration well tested

Litchendjili-6 well tested

Nene-3 exploration well tested

2014

Nene field early development plan approved

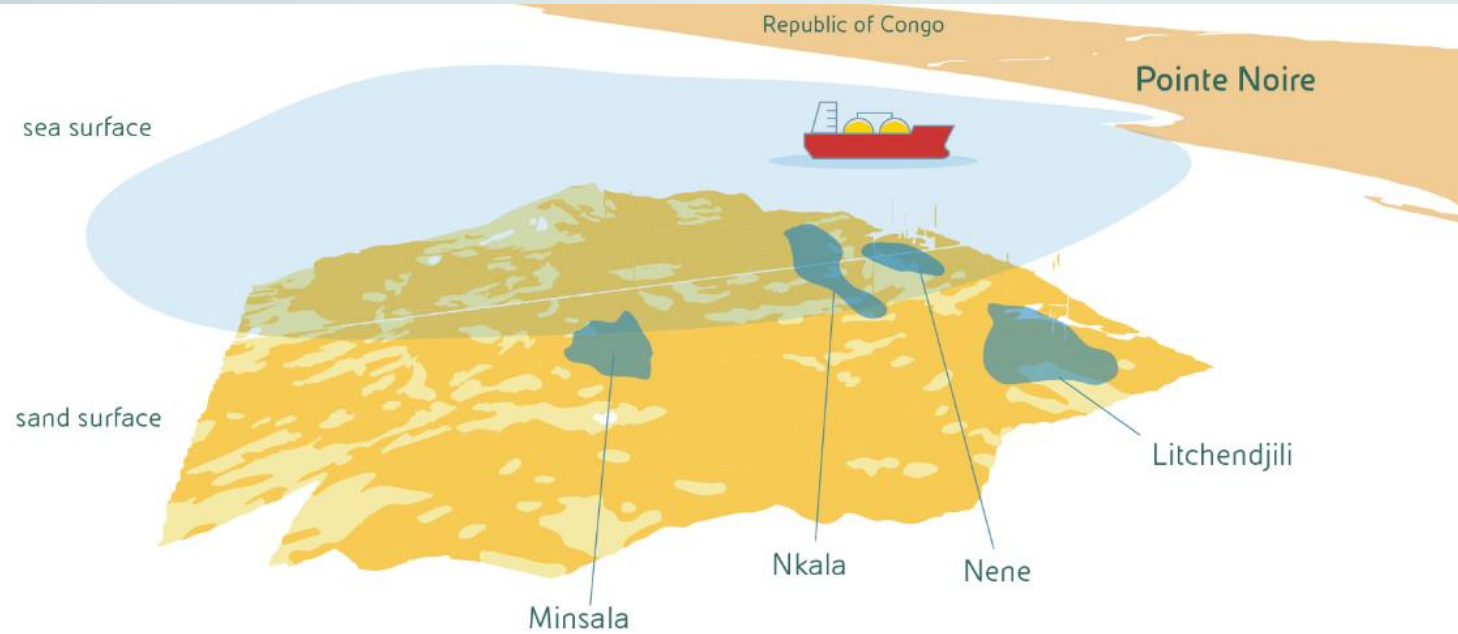
Nene early development Final Development Decision

Minsala-1 exploration well makes significant oil discovery

Nene first oil production

2015

Litchendjili Phase 1 first production



Production started 16 months after discovery

A few highlights

Some data to show the success of the activities developed so far:

6 bln boe

hydrocarbons discovered in 2015-2017 in the block (considering the volumes from field studies)

44

wells drilled

160 kboe

production at plateau

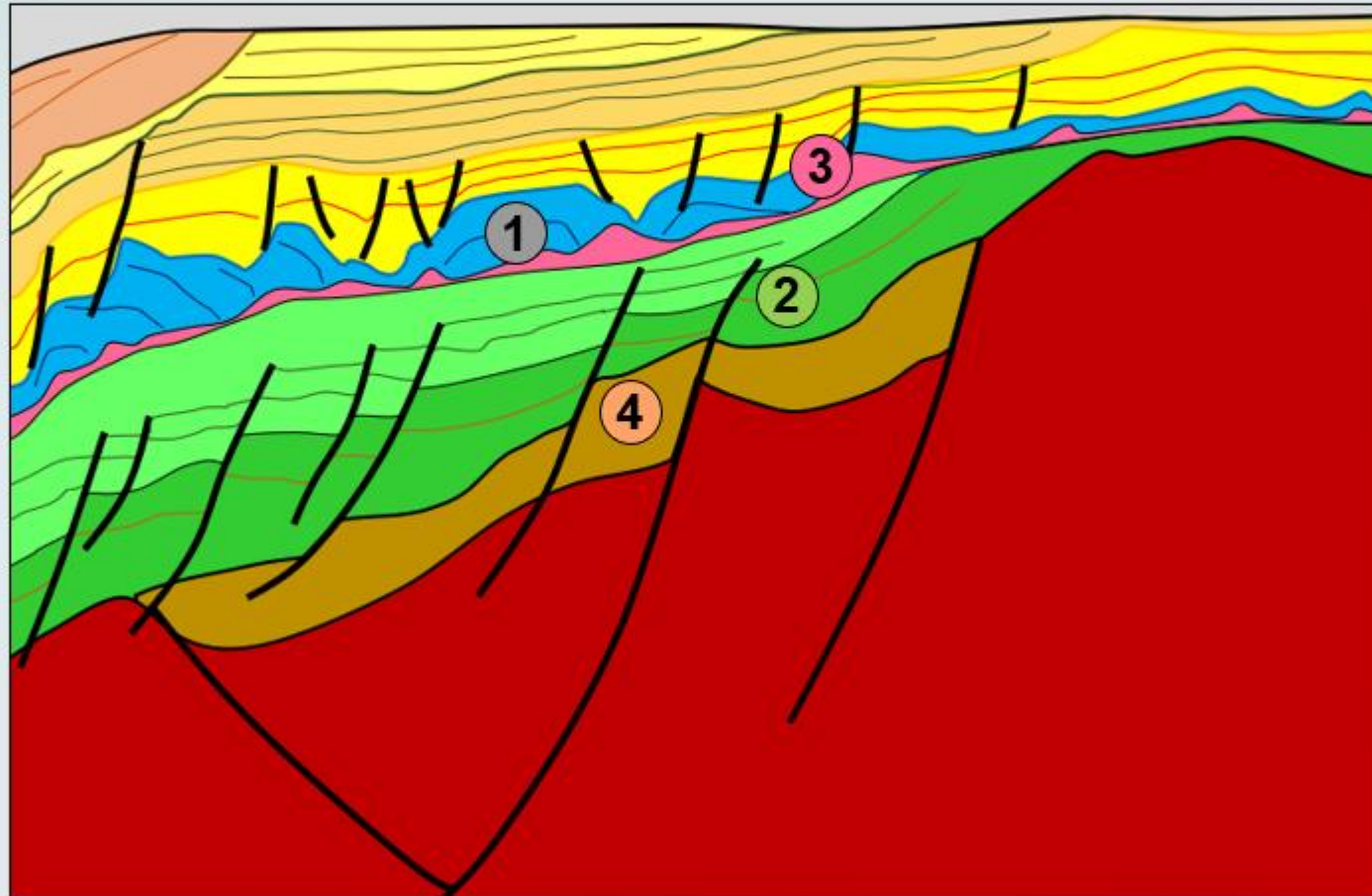
Images courtesy of ENI

Congo

4 reasons why new data is needed

1. Albian Carbonate trends

Sendji Carbonate trend is under-exploited in this



2. New Presalt Plays

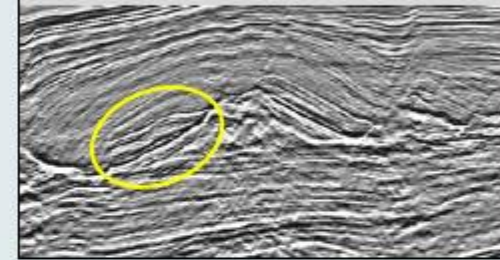
New presalt play at Tchibeli can be revealed here.

Perenco opens new pre-salt Congolese play ENERGY VOICE



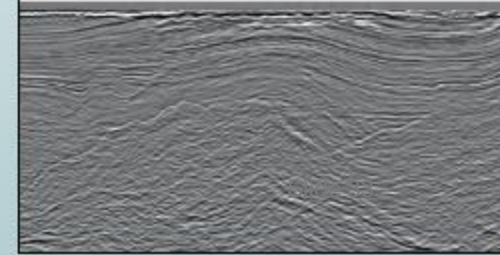
3. Salt flank plays

New play concepts proven in Angola need OBN imaging.



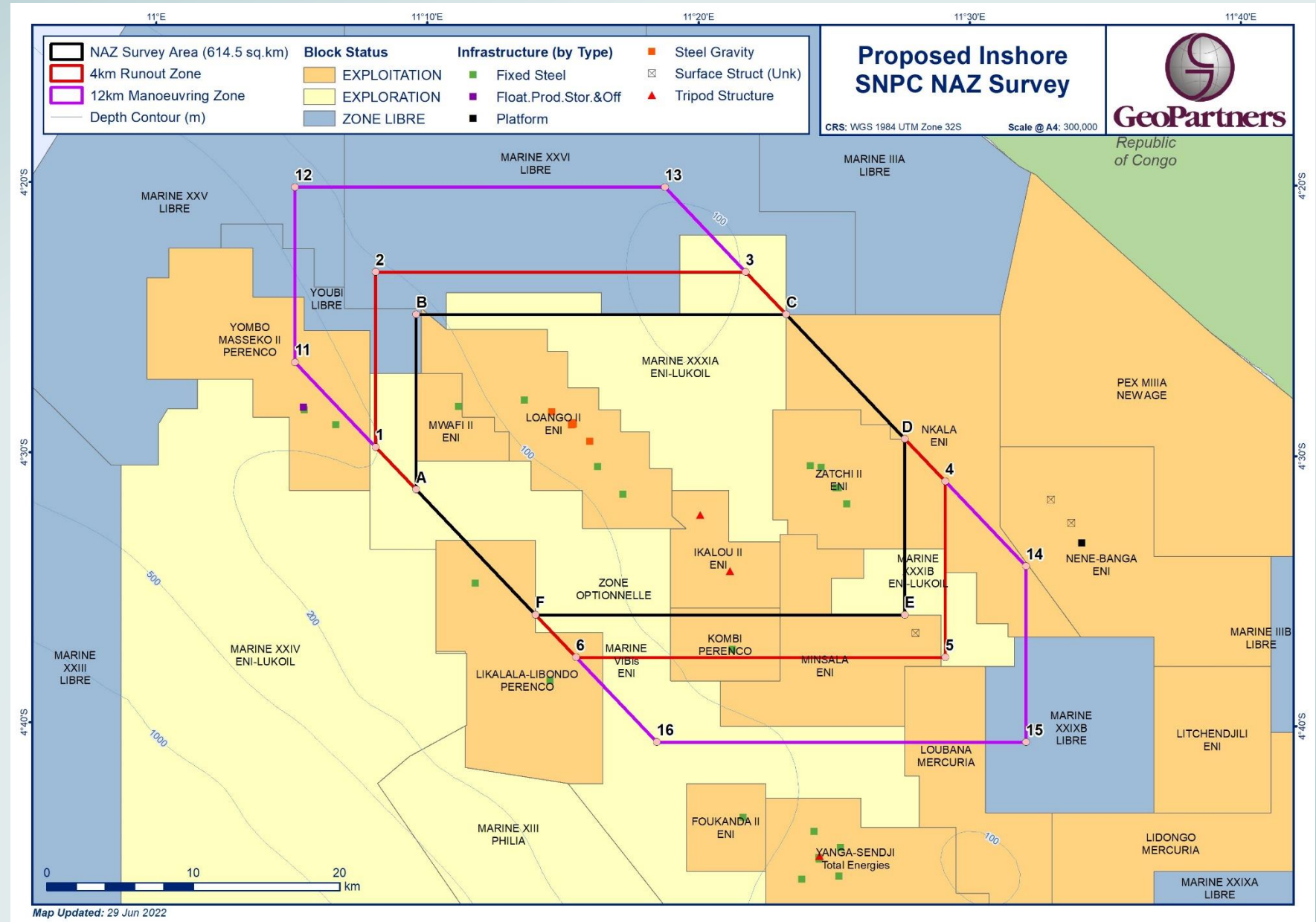
4. Rift structure imaging challenges

Deep structure is historically poorly imaged.

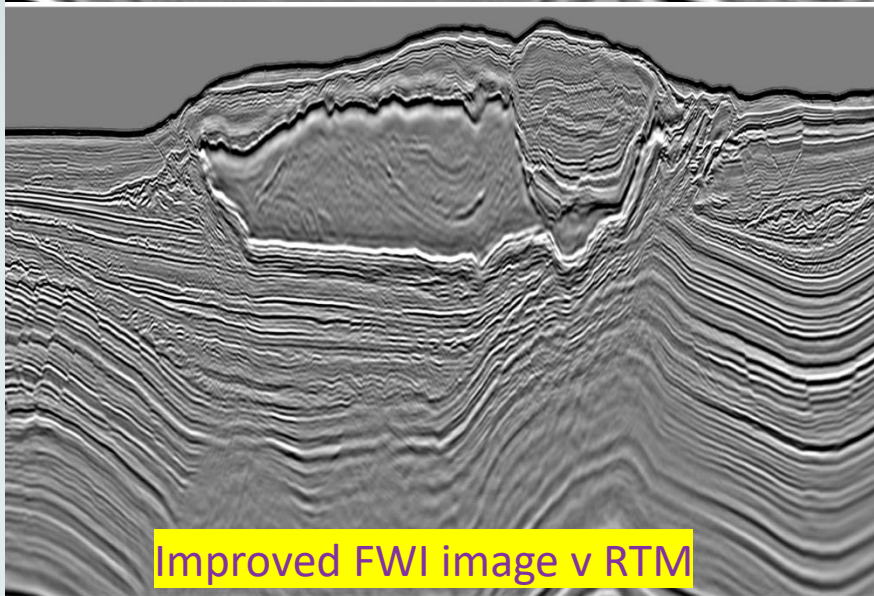
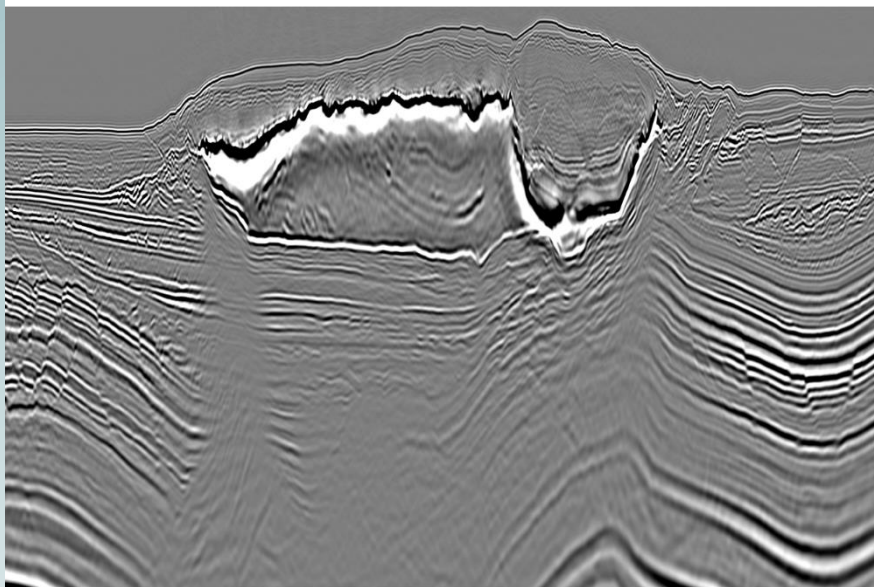


Congo

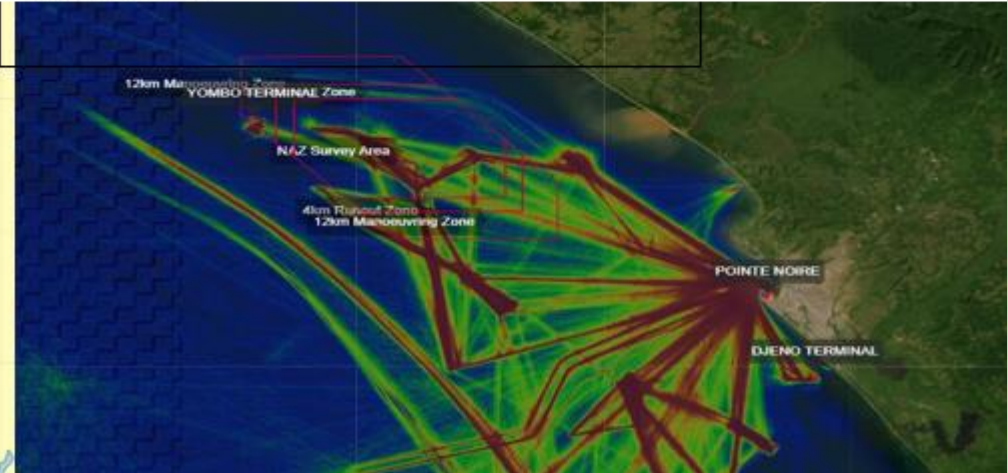
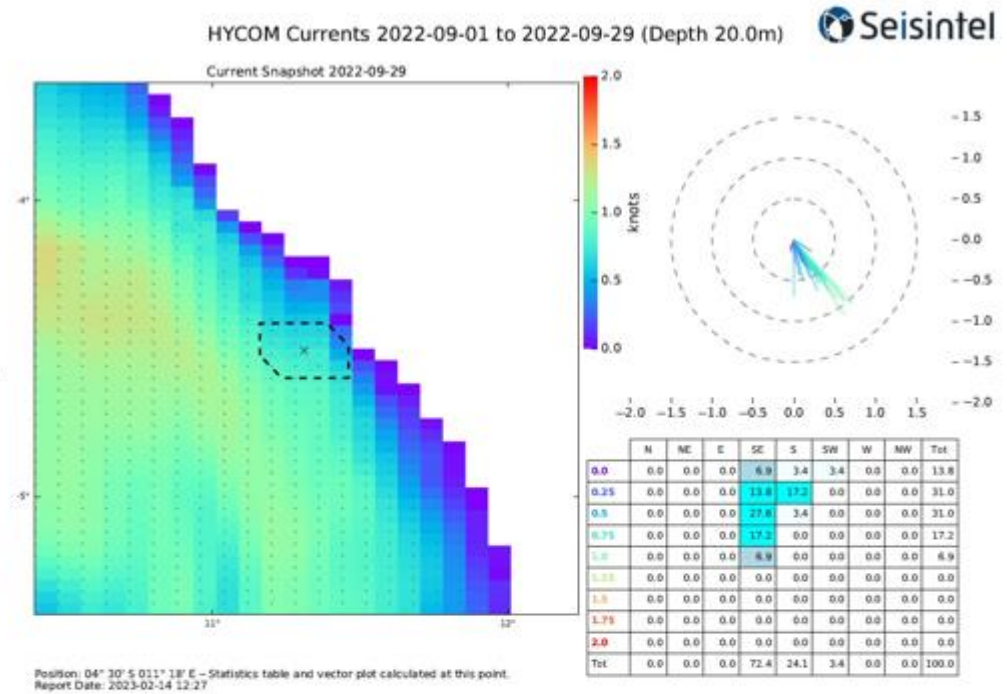
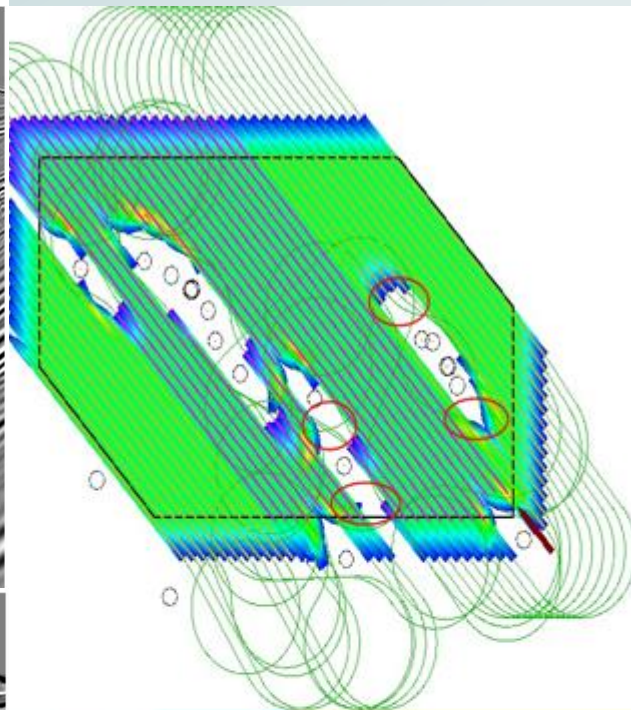
- Total survey area over 5,300 sq. km
- Phases planned according to client interest
- Phase planned according to technique – towed streamer with node infill around platforms
- Potential initial Phase 1 of 600 sq. km (black polygon)



Congo



Improved FWI image v RTM

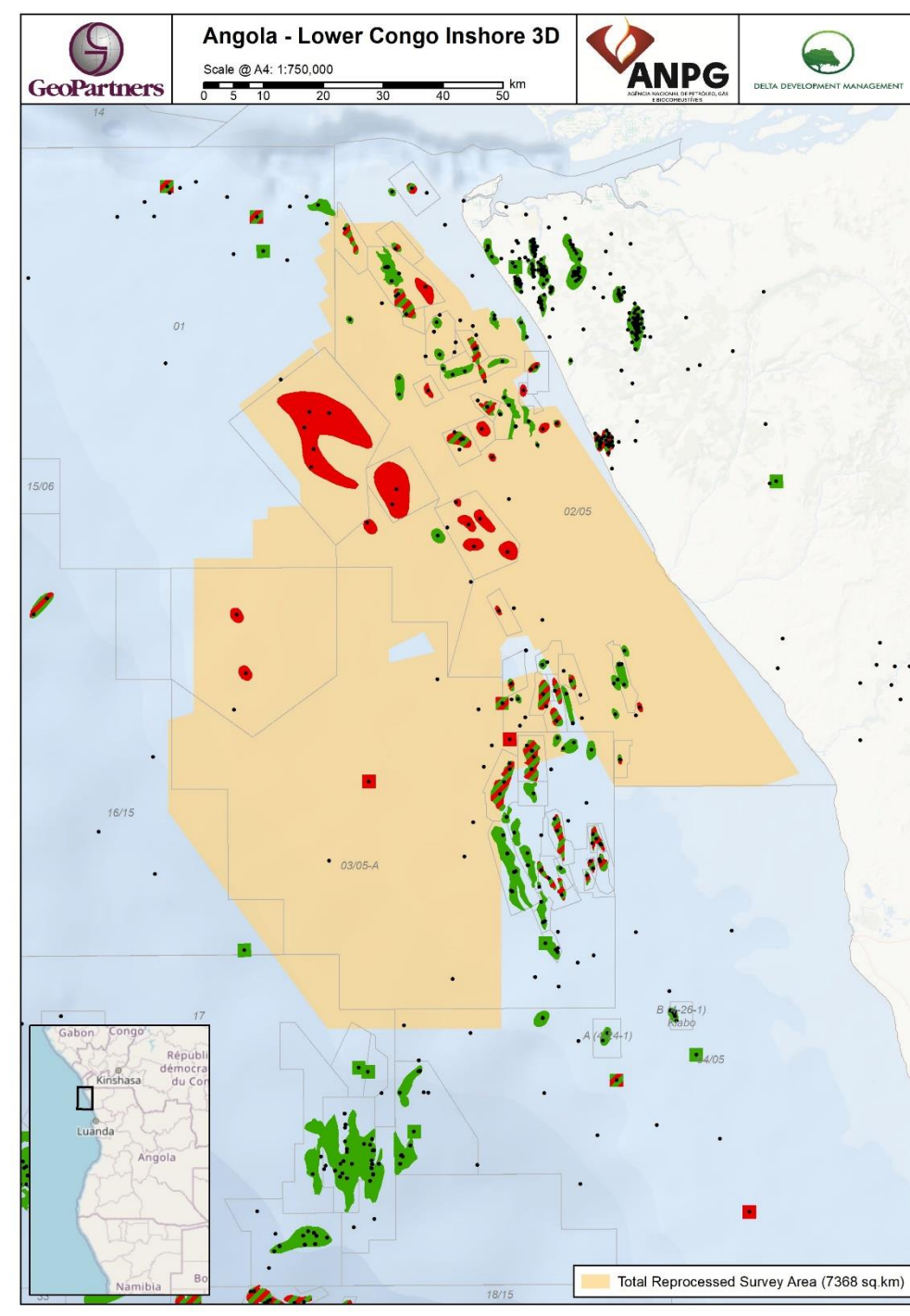
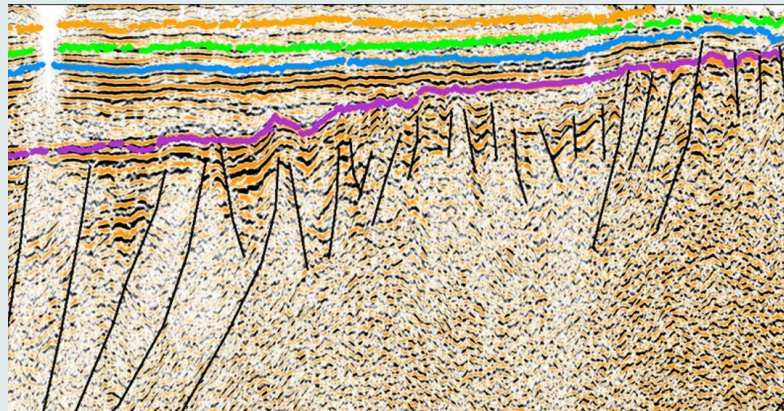


Angola

Angola is one of the power houses of oil and gas production in Africa and GeoPartners are focused on helping future exploration efforts.

We have 3 projects in Angola currently (with additional data brokerage coming November 2023):

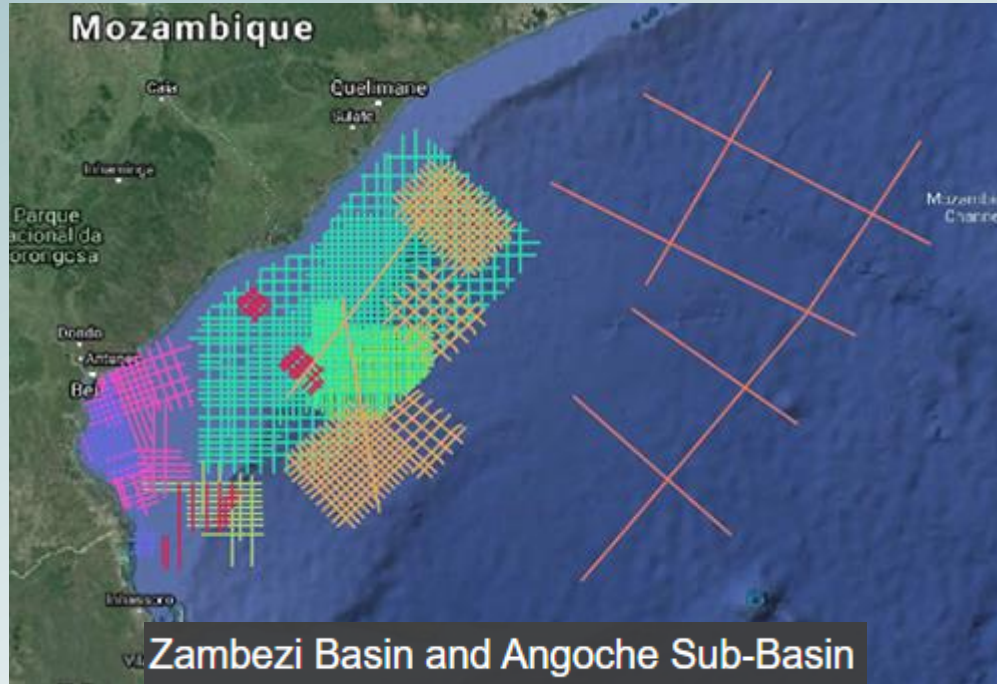
- Blocks 1,2 3 legacy data merging and reprocessing – resulting in approx. 8,500 sq.km of reprocessed 3D seismic.
- New 3D seismic over Blocks 46,47 and 31. Total area = 8,500 sq.km of MC3D PSTM/PSDM.
- Angola Onshore Lower Congo Brokered 2D – 1,650 km



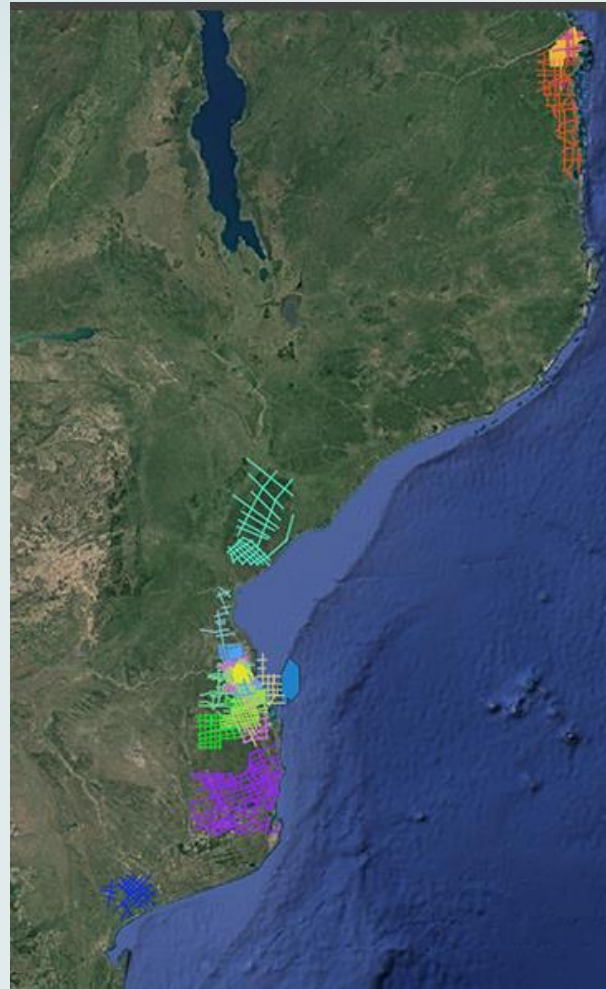
Mozambique

- Mozambique has proven reserves of more than 125 TCF of natural gas
- Mozambique ranks at number 4 in the global list of reserves.
- When production in the Rovuma Basin ramps up, it will also become the world's 4th largest gas exporter.
- Future discoveries are waiting too, with the Angoche Basin completely bereft of wells

Mozambique - Brokerage

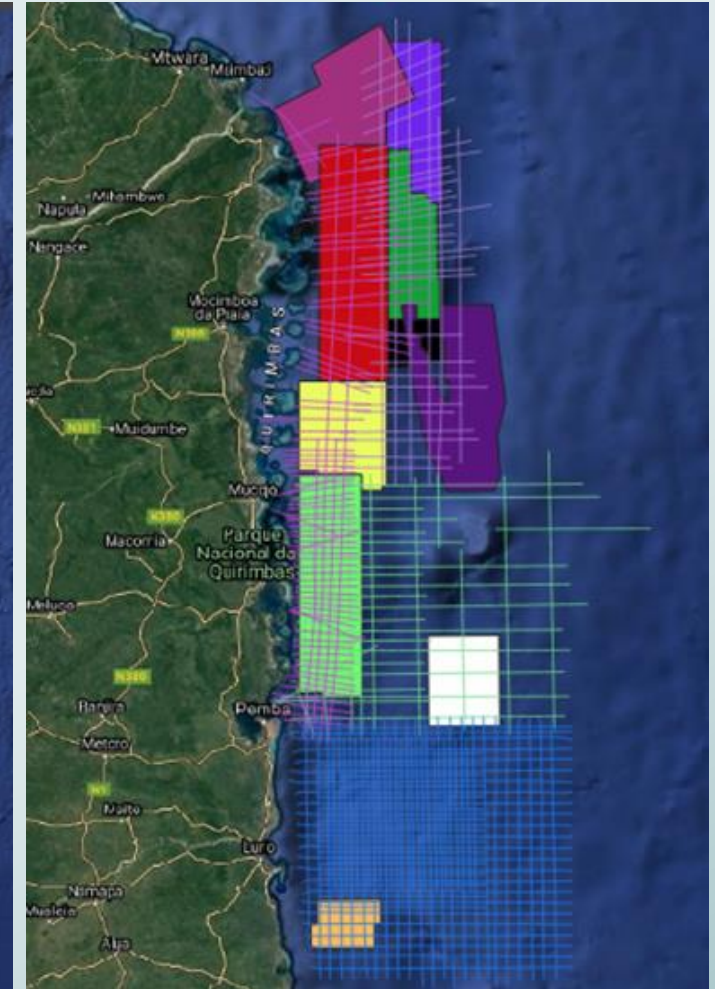


12 x 3D surveys
Over 60,000 km of 2D data



Limpopo Basin (Mozambique Plain) & Onshore Data

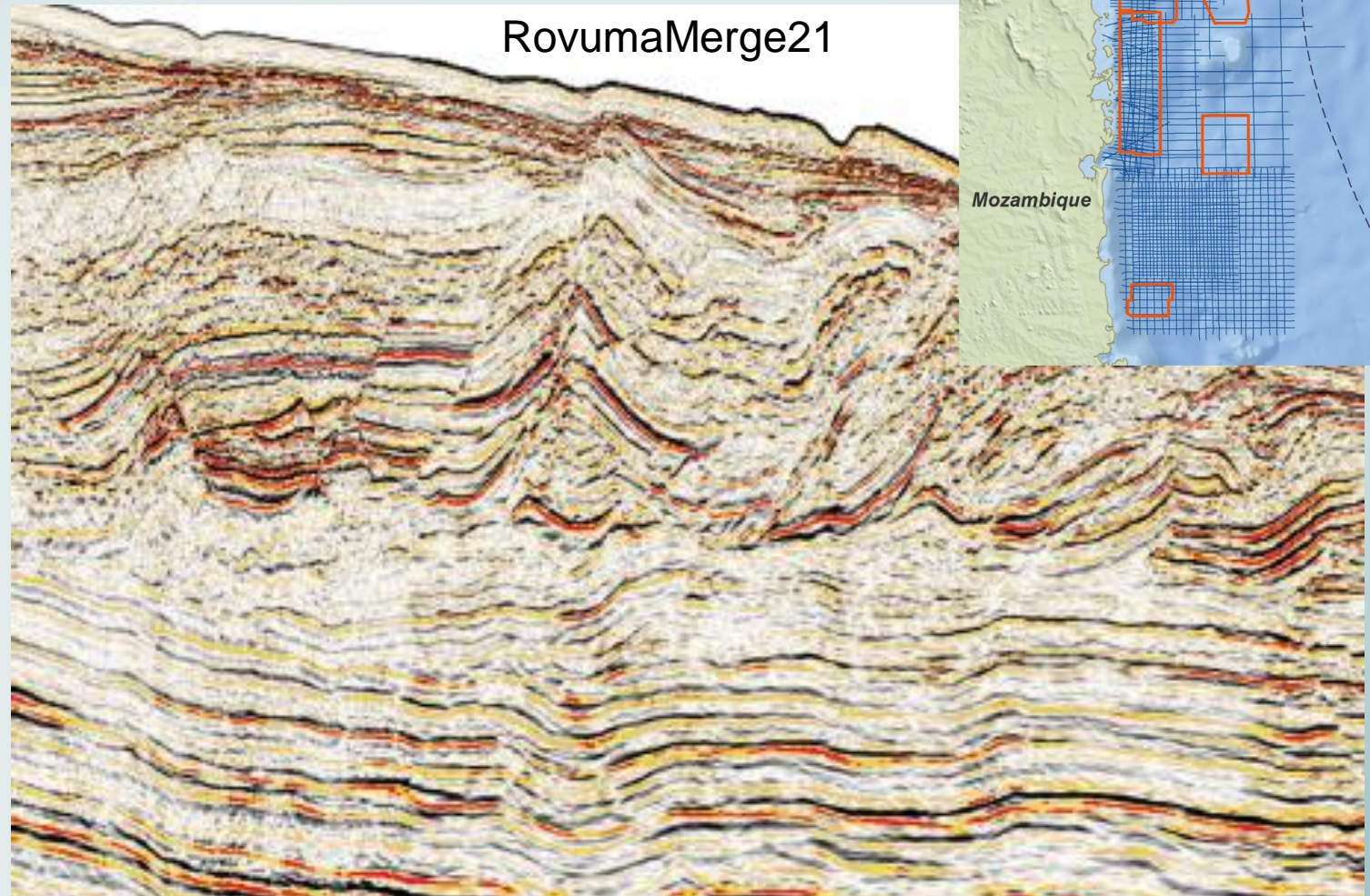
Rovuma Basin



Mozambique - Reprocessing

In order to provide a regionally consistent data volume across the whole of the offshore Rovuma Basin area, GeoPartners has merged and reconditioned the existing 2D and 3D seismic surveys into a single matched data volume.

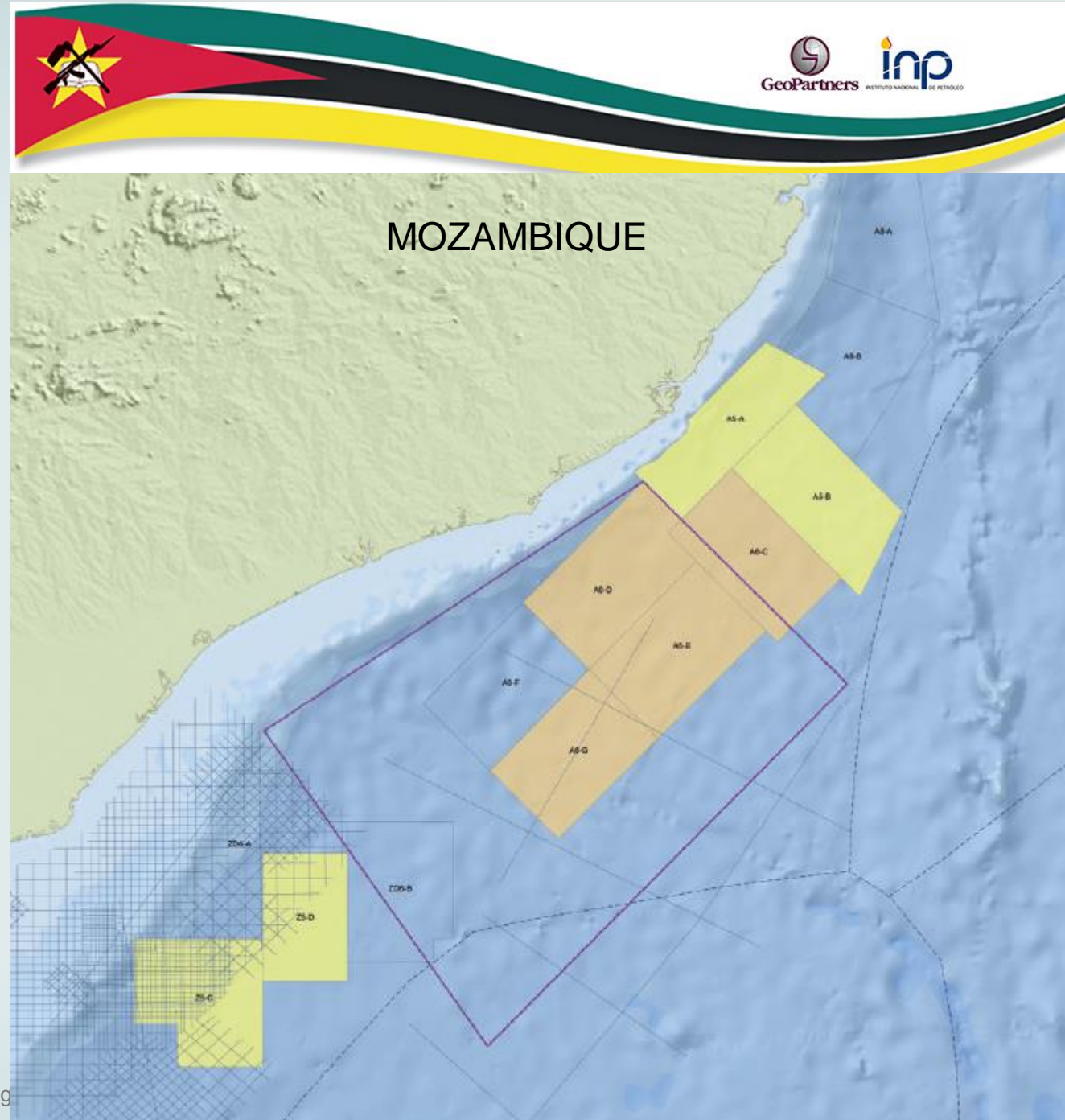
The volume comprises over 20,000 sq. km of 3D seismic and over 16,000 km of 2D seismic. Full off set and angle stacks are available over an area of over 45,000 sq. km.



Mozambique – New Acquisition

GeoPartners are currently readying logistics to begin acquisition of >20,000 sq.km of modern long offset 3D data in the Angoche Basin.

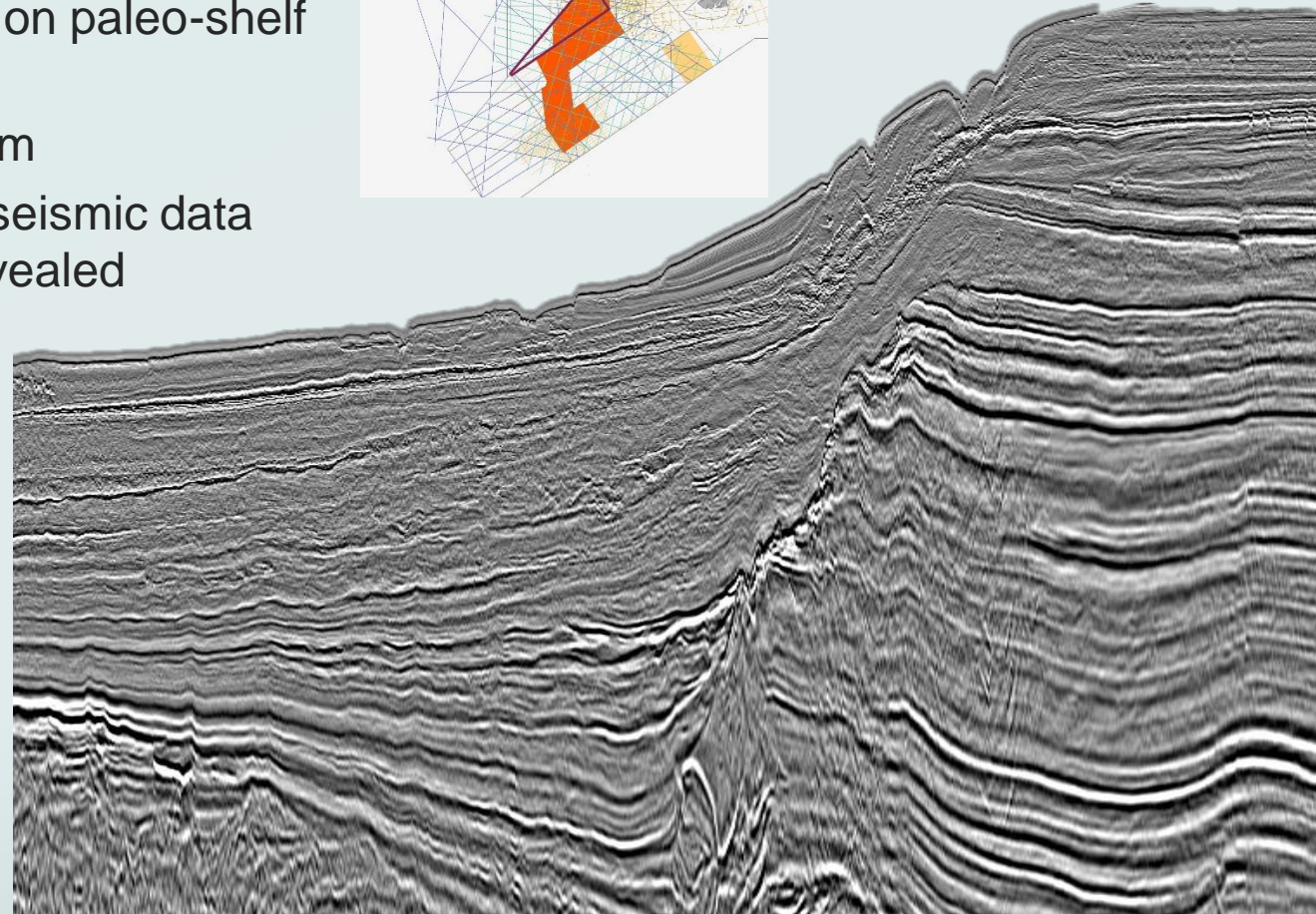
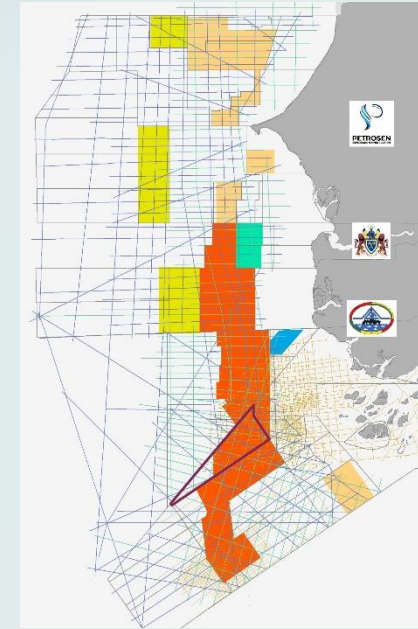
The new survey will cover blocks awarded in the 6th Licensing Round as well as open blocks which are open for direct negotiation.



Block 4B

- In 2017 the owners of GeoPartners took operatorship of Block 4B, Guinea-Bissau under the SPV of Bissau Exploration Company (“BEC”).
- Block 4B is located in the southern MSGBC Basin, on paleo-shelf edge trend with the Senegal discoveries in 2014.
- Block 4B lies in water depths of c. 1000 m – 3,000 m
- 90% of the block is covered with modern 2018 3D seismic data (Jaan project), which after full interpretation has revealed enormous potential in 4 plays.

1. Barremian fan play – turbiditic fan similar to Guyana/Suriname with stratigraphic and structural trapping elements with AVO conformance. Billion barrel oil potential.
2. Lower Cretaceous Shelf edge play (Sangomar analogue)
3. Apto-Albo channel plays with AVO support.
4. Salt-diapir play



Conclusion

- Africa has had a great success over the last 10 years with over 150 discoveries drilled.
- GeoPartners have been well placed to help image the areas pre-discovery as well as after the region's gain focus.
- We are well placed with strong government relationships to support the future discoveries, via:
 - New acquisition of MC 2D and 3D data
 - License round support
 - Brokerage of legacy data
 - Farm out and Block promotion



GeoPartners

THANK YOU

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