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# Re-assessing hydrocarbon prospectivity potential in Block 1, Orange Basin, offshore South Africa

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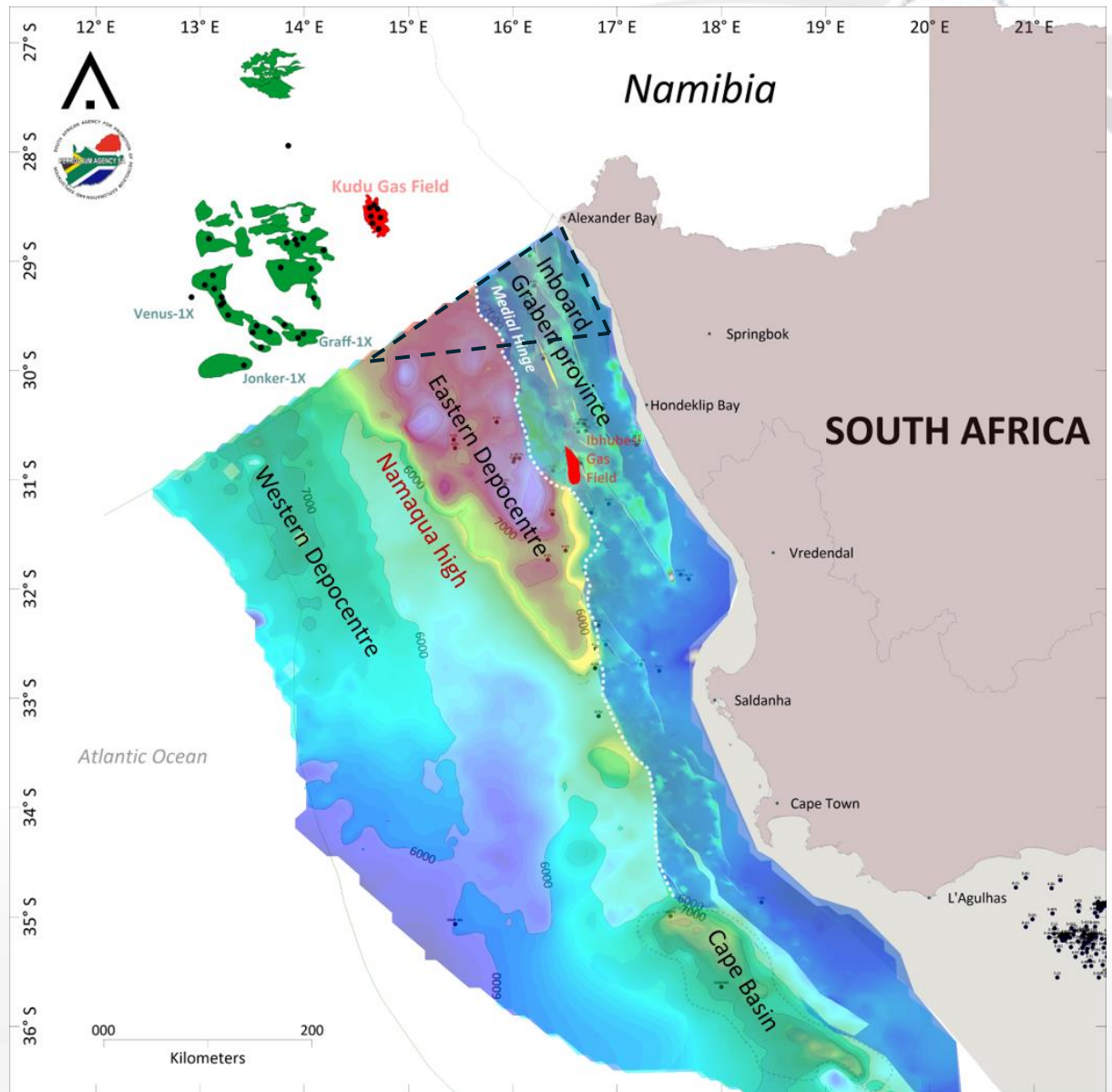
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# INTRODUCTION: BLOCK 1

- Renewed interest in the petroleum potential of Block 1 is driven by its **strategic position** along the Namibia–South Africa maritime border
- **Close proximity** to discoveries such the Shell's Graff-1X and La-Rona-1X, Galp Energia (Mopane) and other prospective areas in Namibia.
- Positioned along a **proven regional petroleum trend**

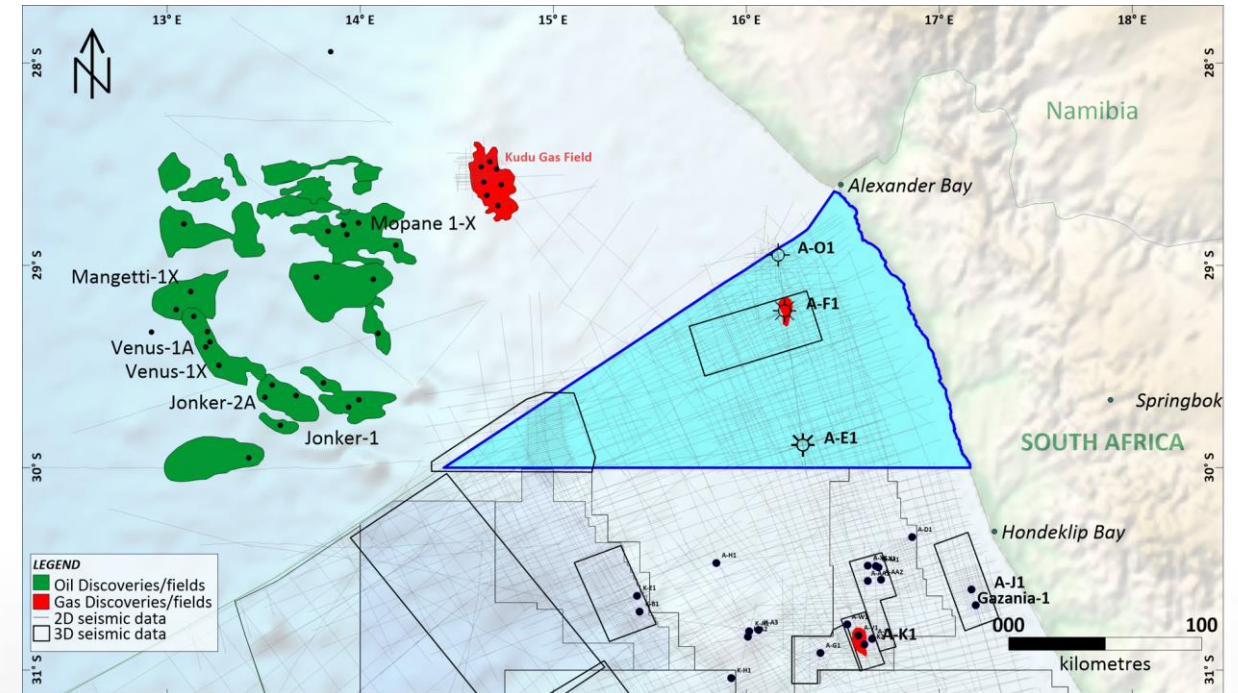


Location of Block 1 within the Orange Basin in South Africa. Oil and gas discoveries within the Namibian sector of the Orange Basin are shown.

# DATA COVERAGE : BLOCK 1



- Petroleum Exploration License 362ER; Block1 is **19,929 km<sup>2</sup>** , in water depths of **~200 m to 1000 m**
- **SEISMIC:**
- **2D:** 20 000 line km of regional 2D data, newer 2D seismic data acquired in 2012 (SPOB; SCOB), and 2015 (NAMZA)
- **3D:** 1 500 km<sup>2</sup> AF2009 and the 1 981 km<sup>2</sup> OB133D-02
- **WELLS:**
- A-F1 — gas discovery
- A-E1 — poor gas shows and oil indications
- A-O1 — stratigraphic calibrations (reservoir markers)



Location of Block 1 within the Orange Basin in South Africa. 2D and 3D seismic Data coverage is shown.

- **Map → Calibrate → Characterise → Evaluate**
- 2D/3D seismic interpretation - Well calibration -Petroleum-system analysis -Seismic attributes -Play / prospect evaluation

# EXPLORATION HISTORY



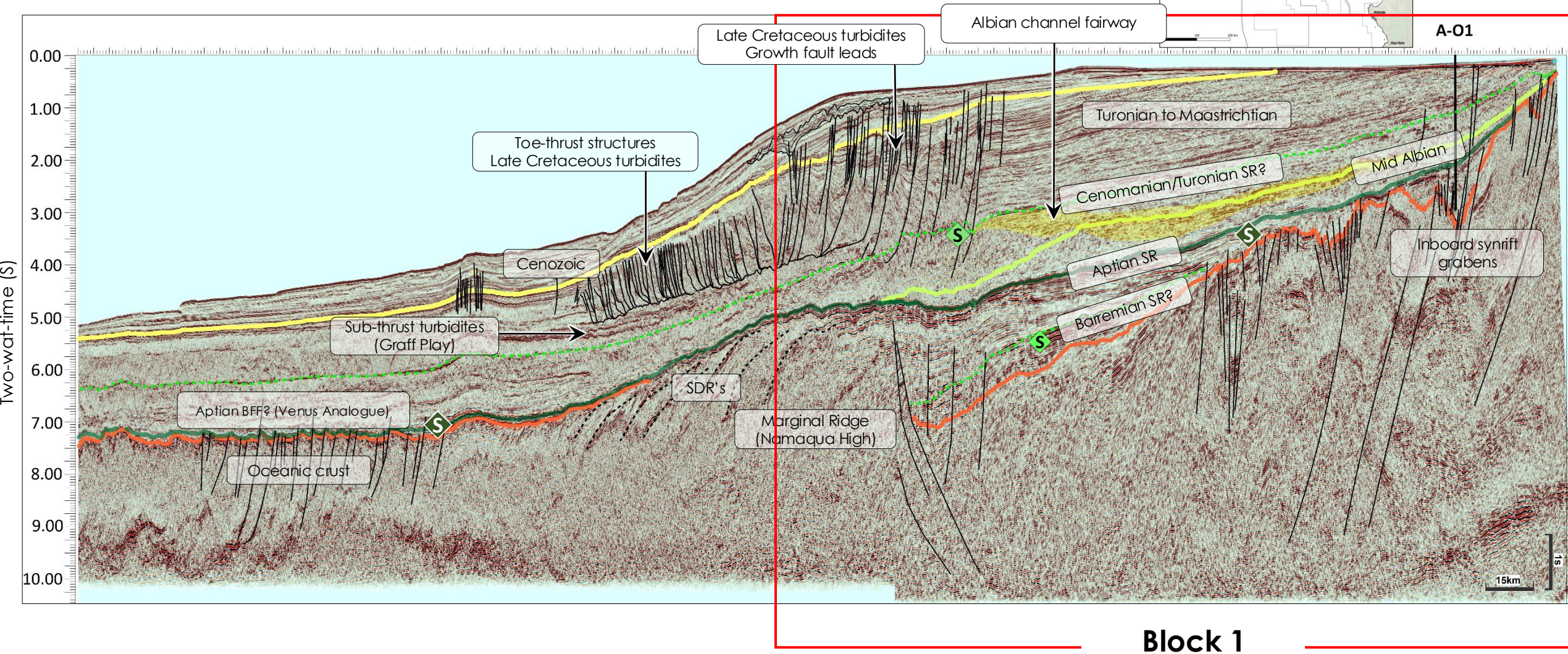
- **Block 1 CBK (362 ER) -2024 to present:**
- Eco Atlantic Oil & Gas Ltd., through its subsidiary **Azinam South Africa** 75% working interest (W.I.) and operatorship of Block 1 along with joint venture partners **OrangeBasin Energies (Pty) Ltd.**, which holds the remaining 25% participating interest



Probable location of Block 1 prospects and leads identified

| Year                                                 | Company and Work undertaken                                                                                                                                                                                   |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Soekor (Southern Oil Exploration Corporation)</b> | 2D legacy data and regional well log data archived at the Petroleum Agency<br><br>Soekor drilled AF-1, A-O1, and A-E1                                                                                         |
| <b>December 2008</b>                                 | Block 1 (ER #83) awarded to Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd (PetroSA)<br><br>Reprocess 2000 line-km 2D seismic/2221 line-km. 750 km <sup>2</sup> 3D seismic/ 1500 km <sup>2</sup> |
| <b>Year 2009-2011</b>                                | AF2009 - 3D seismic acquired                                                                                                                                                                                  |
| <b>February 2013</b>                                 | Cairn South Africa Pty Ltd (Cairn) farm-in for 60% working interest (W.I.), operatorship, PetroSA retains 40% W.I.                                                                                            |
| <b>April 2013</b>                                    | Cairn completed 3D seismic acquisition, 1981 km <sup>2</sup>                                                                                                                                                  |
| <b>March 2014 – September 2018</b>                   | Cairn completed 2D acquisition, 2974 line km; application submitted for EA/EMPR authorization for drilling; application submitted and approved for 2nd Renewal Phase                                          |
| <b>Year 2022 – 2024</b>                              | Azinam (75%) and Tosaco (25%) were the current holder of a Petroleum Exploration License (362ER) in Block 1.                                                                                                  |

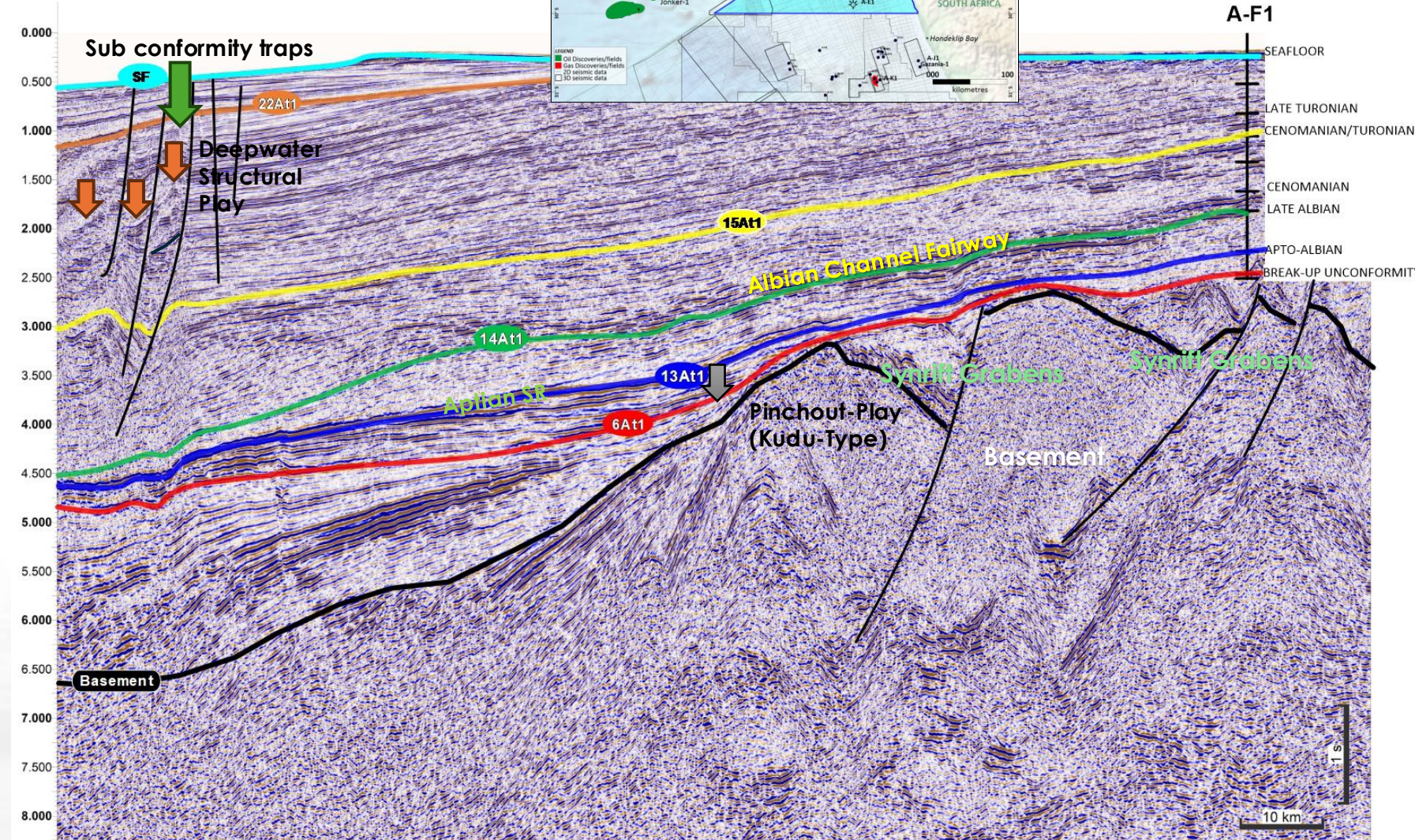
# PROSPECTIVITY: OVERVIEW



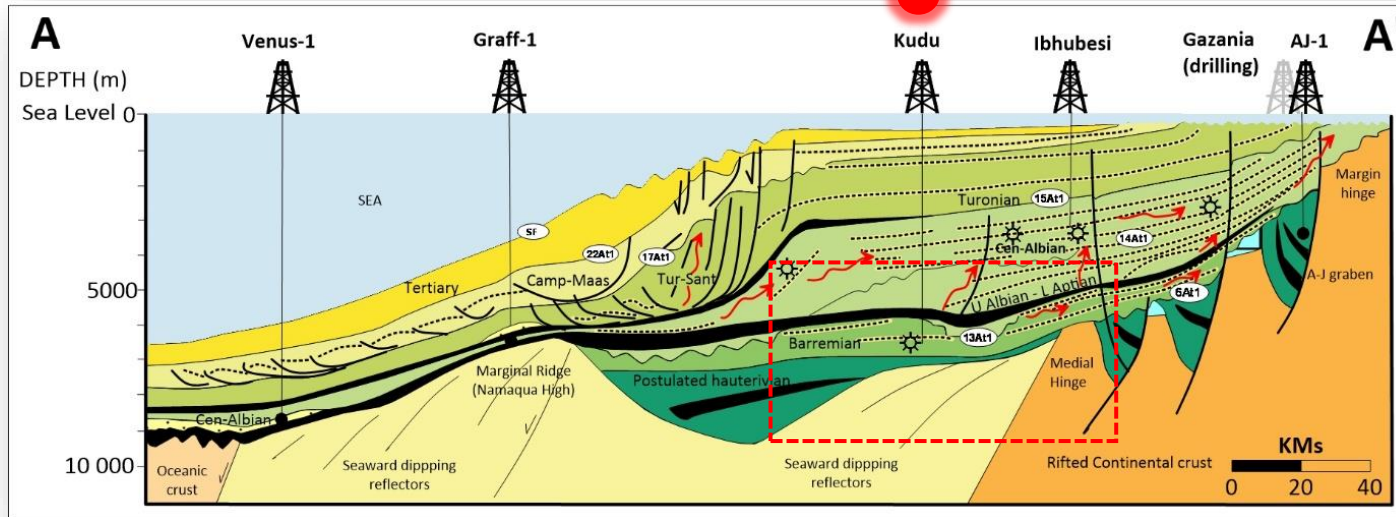
Block 1

## BLOCK 1 PLAY TYPES:

- **Barremian Stratigraphic-Structural Play** (Kudu type)
- **Hauterivian Stratigraphic Inboard Synrift Graben Play** (A-J/Gazania type)
- **Albian Stratigraphic-Structural Play** (Ibhubesi type)
- **Outboard Upper Cretaceous Deep water structural play** (Growth and Thrust Fault Play)

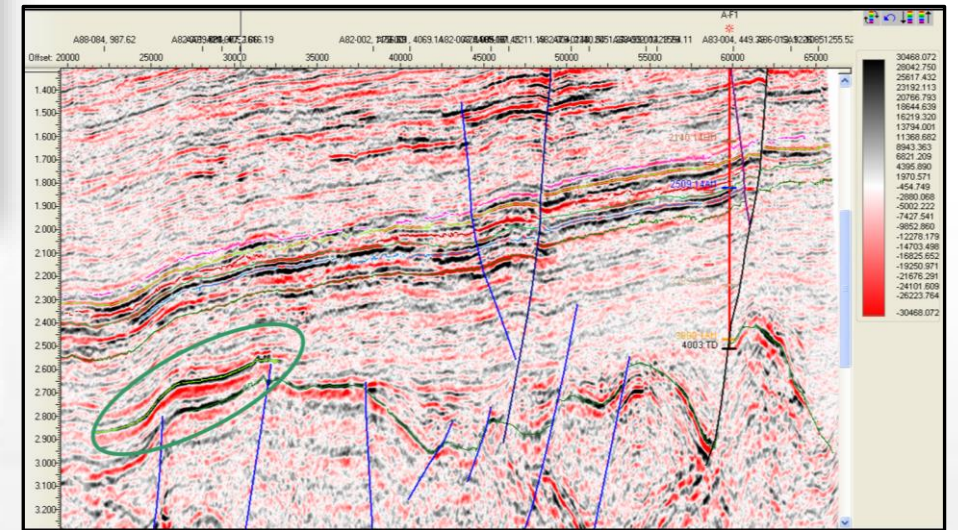
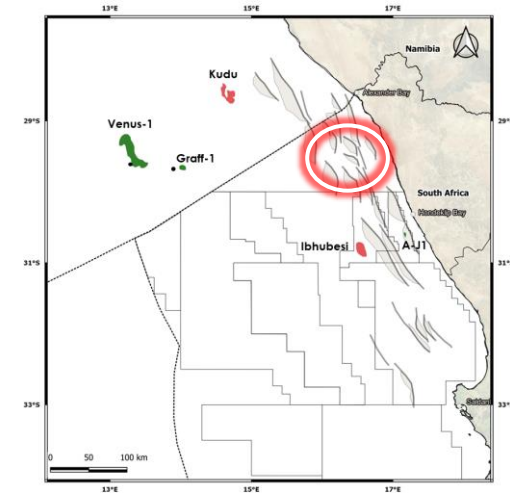


# BARREMIAN STRATIGRAPHIC-STRUCTURAL PLAY (KUDU TYPE)



IHS Markit upstream basin content

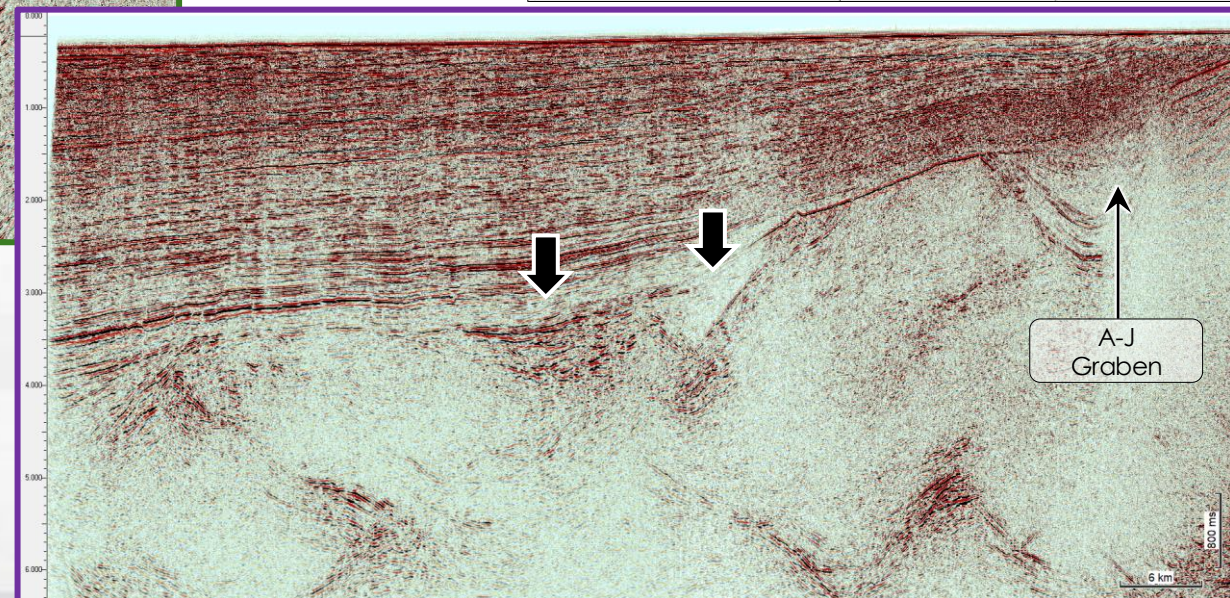
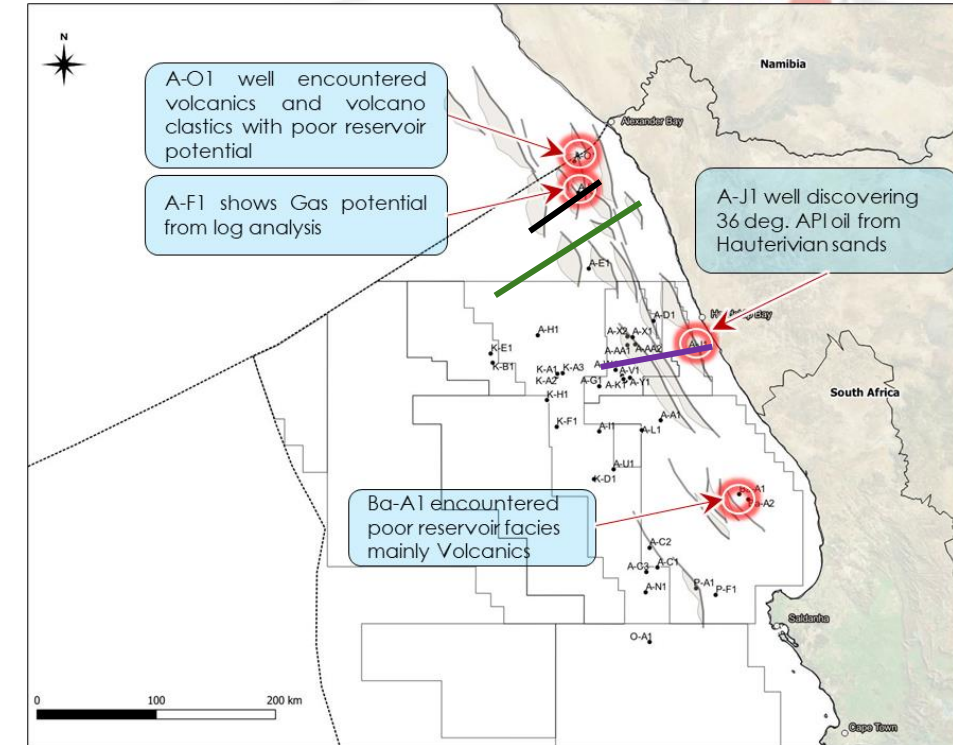
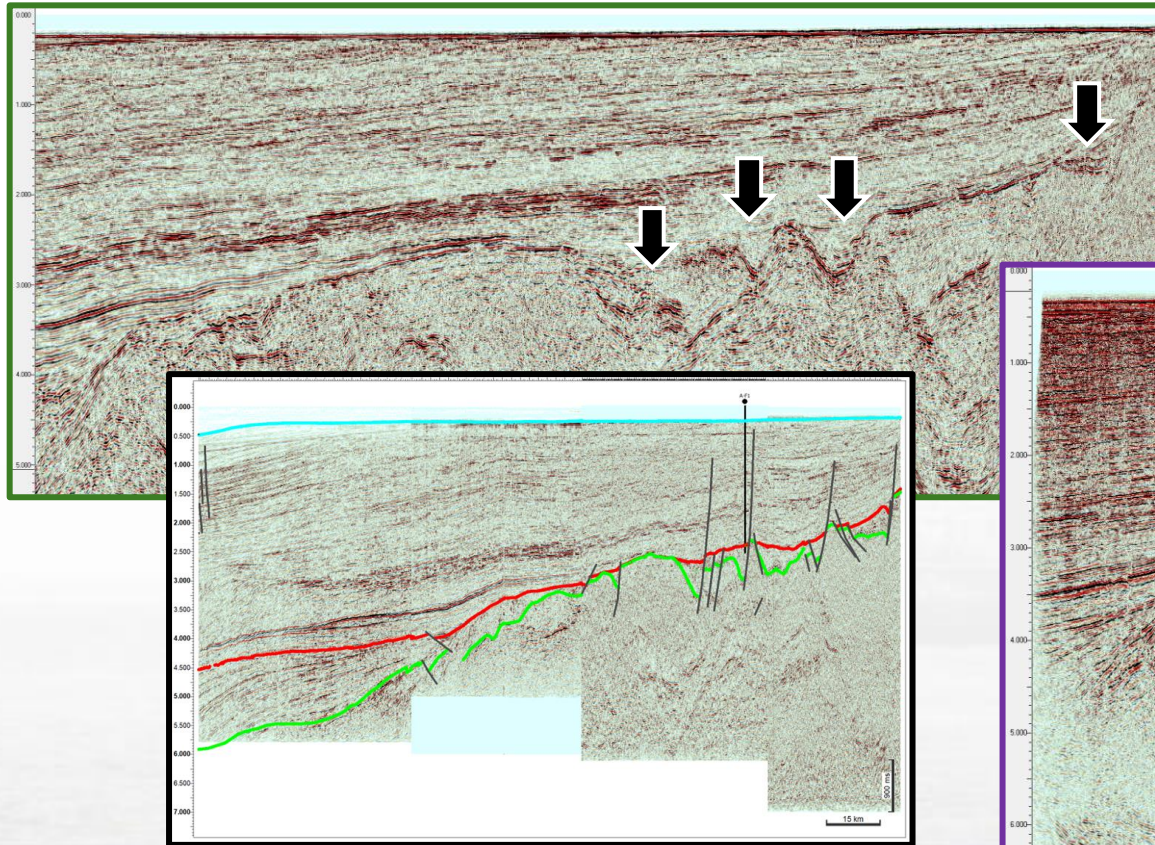
- Kudu type Barremian aeolian sandstones commonly drapped over basement highs
- Barremian gas play: GIIP ~2Tcf
- Not enough wells drilled to explore potential



# PROSPECTIVITY: INBOARD PLAYS

## Synrift (Late Jurassic to Hauterivian)

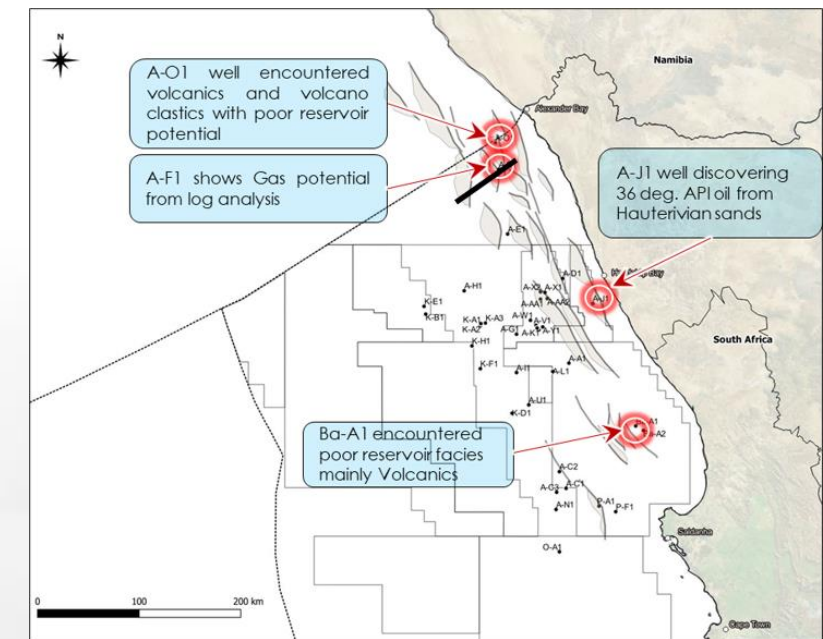
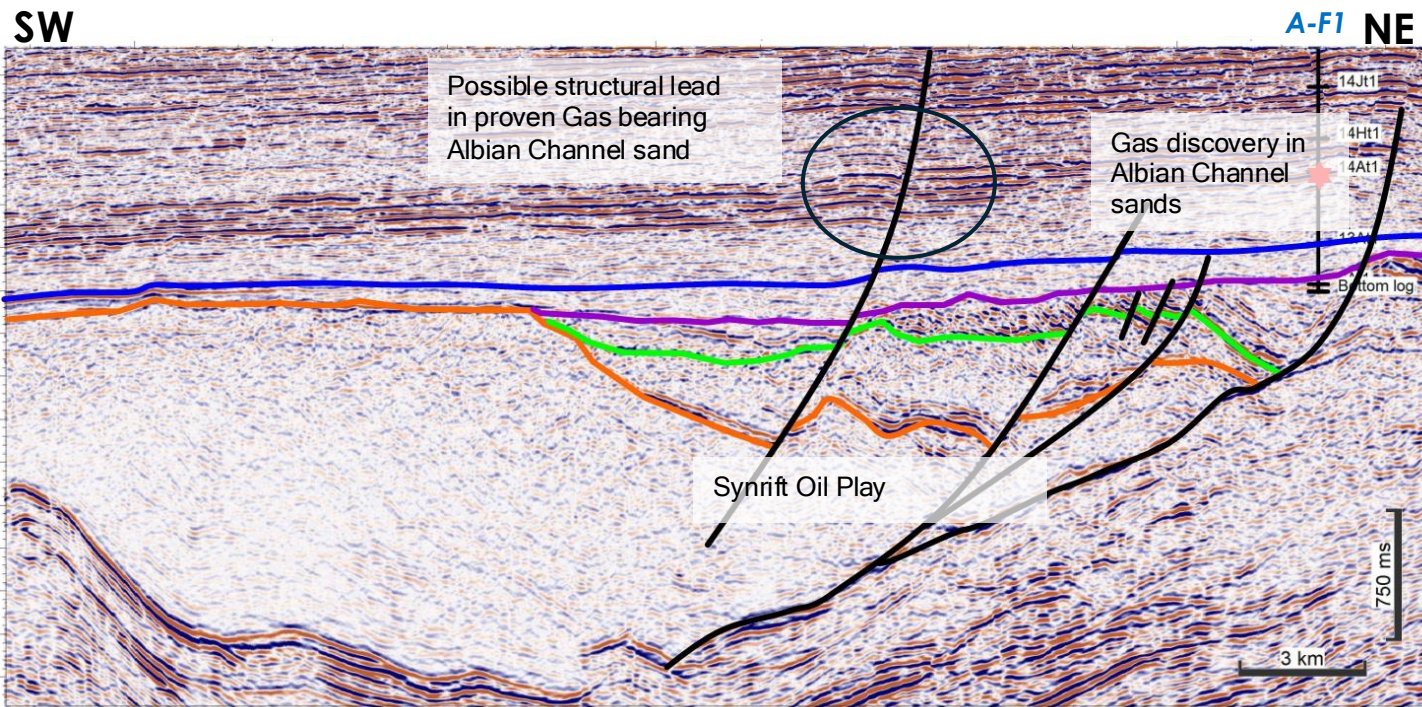
- Rifted continental crust associated with **coast-parallel half grabens**
- Not enough wells drilled to explore synrift potential
- Several **undrilled grabens** of various sizes along the inner synrift trend (sizes between 400 and 520km<sup>2</sup>) in the north (A-J1 is 350km<sup>2</sup>)



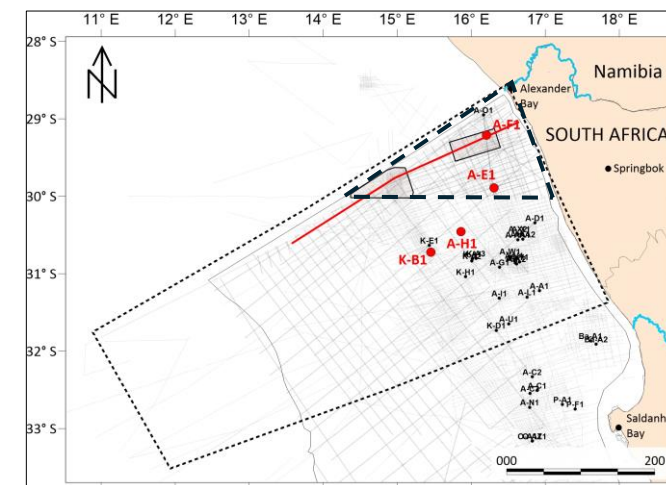
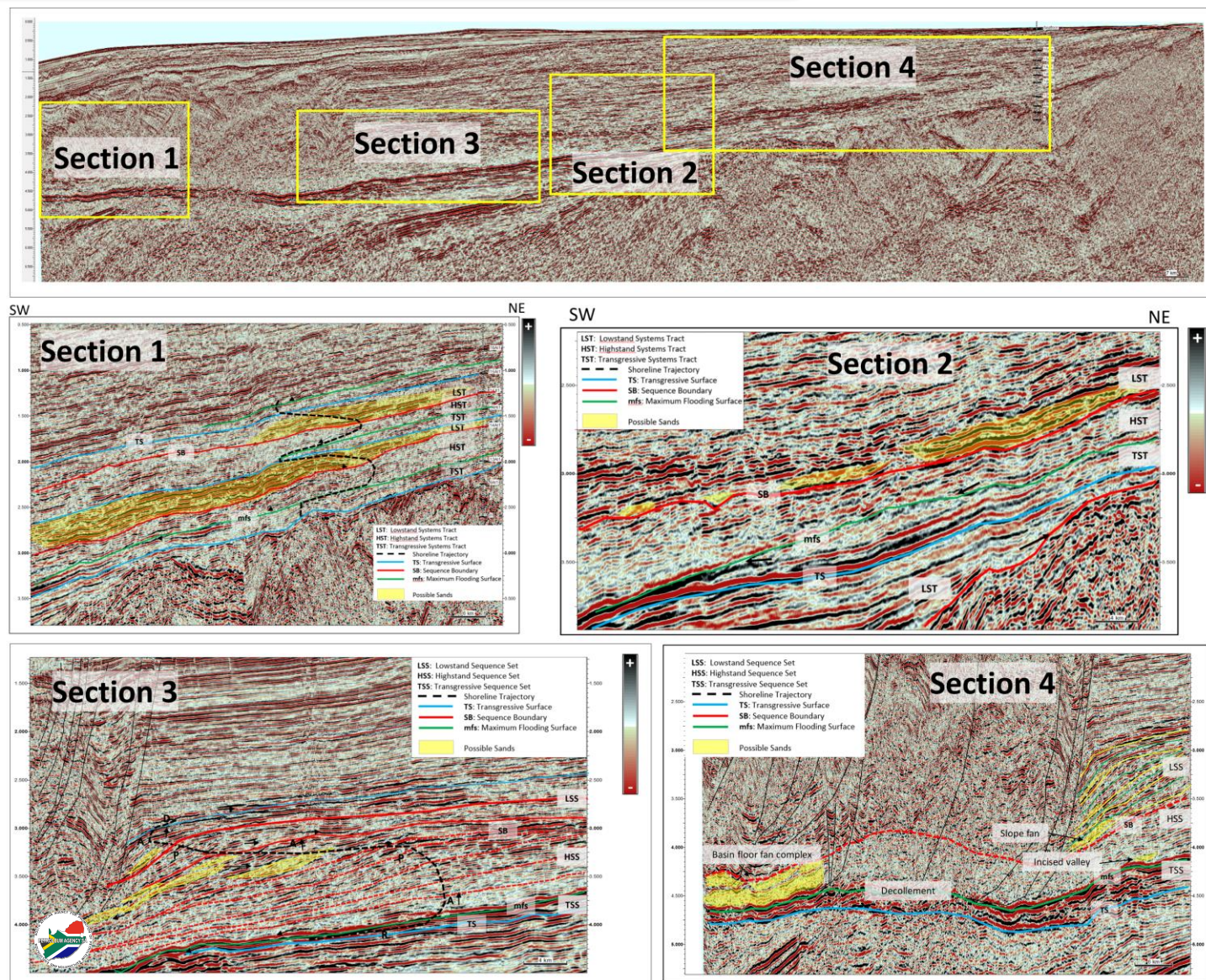
# PROSPECTIVITY: INBOARD GRABEN PLAYS



- Proven syn-rift petroleum system — **A-J1 oil discovery**
- Fault-bounded grabens with multi-phase rifting and inversion
- Comparable Block 1 grabens remain largely undrilled
- **Stacked potential** — syn-rift targets + proven Albian gas-bearing channel play

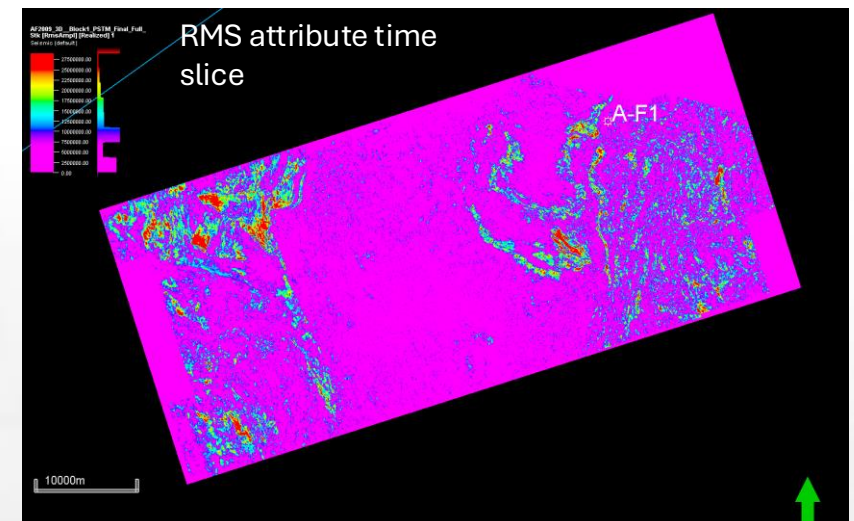
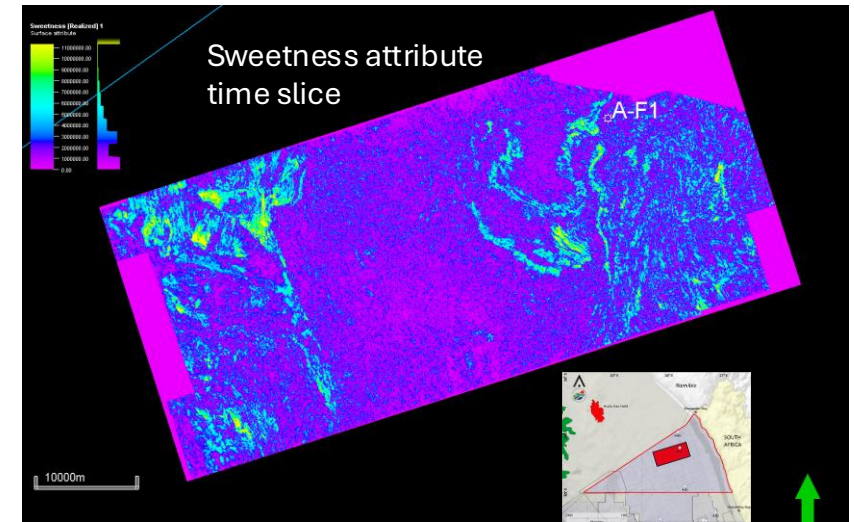
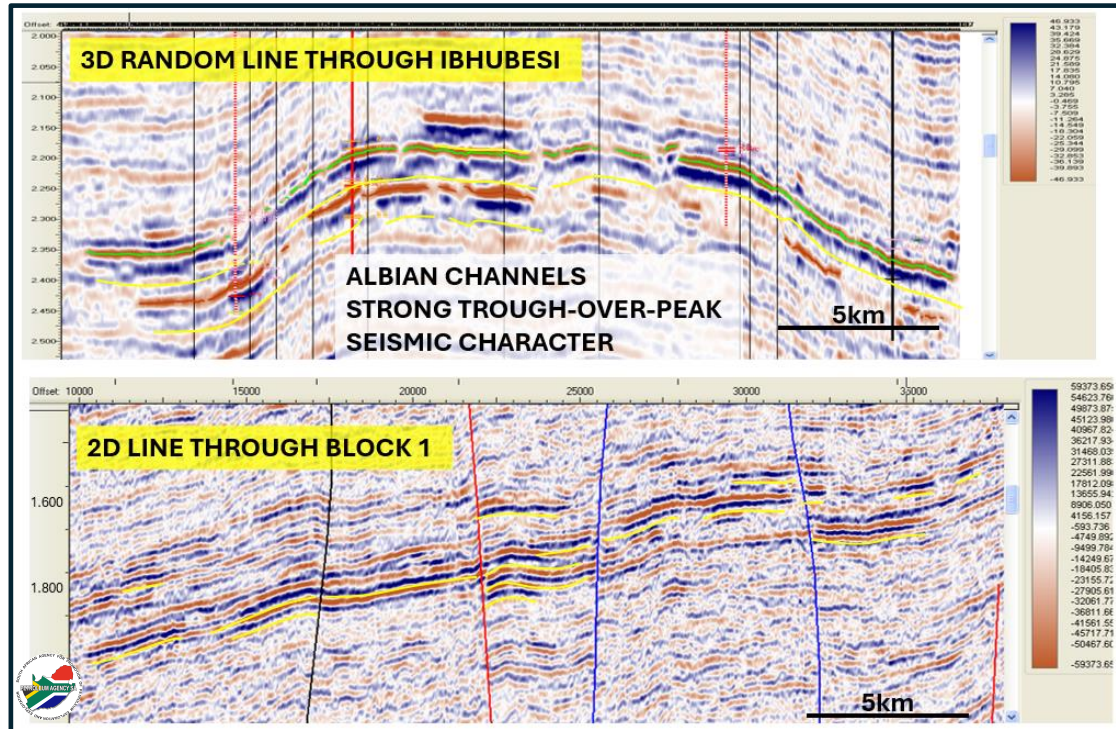


# ALBIAN CHANNEL SYSTEMS:

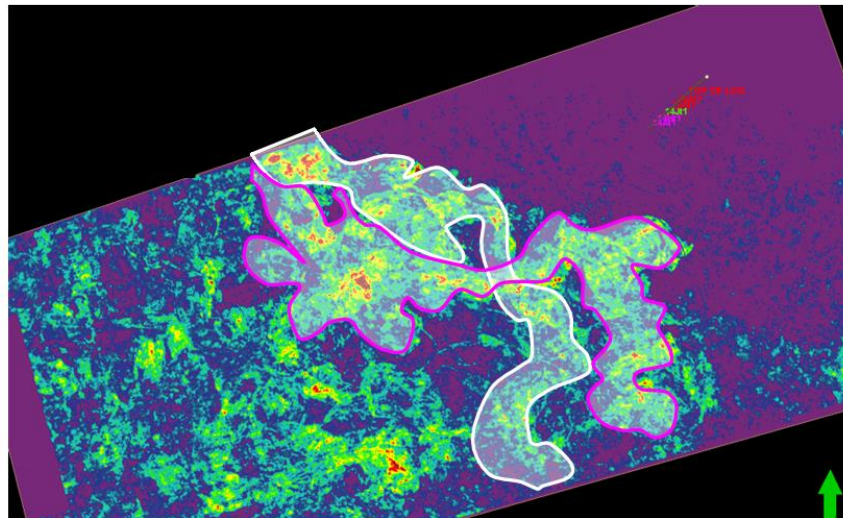
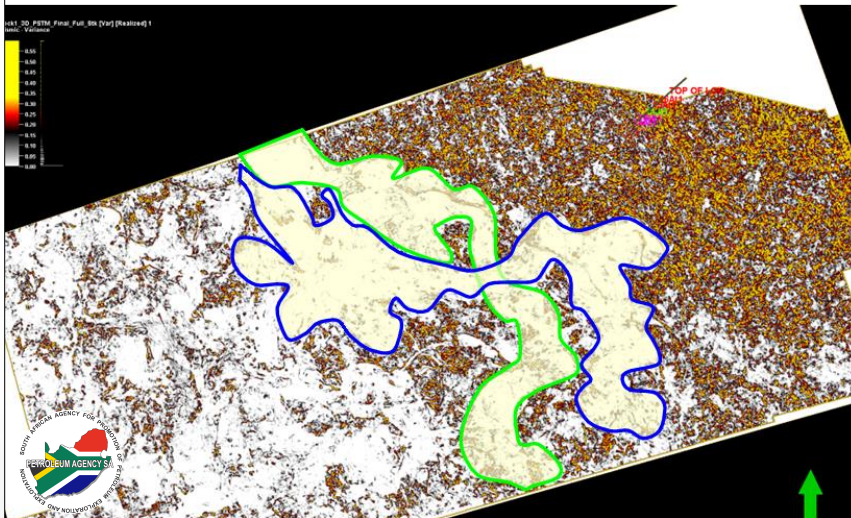
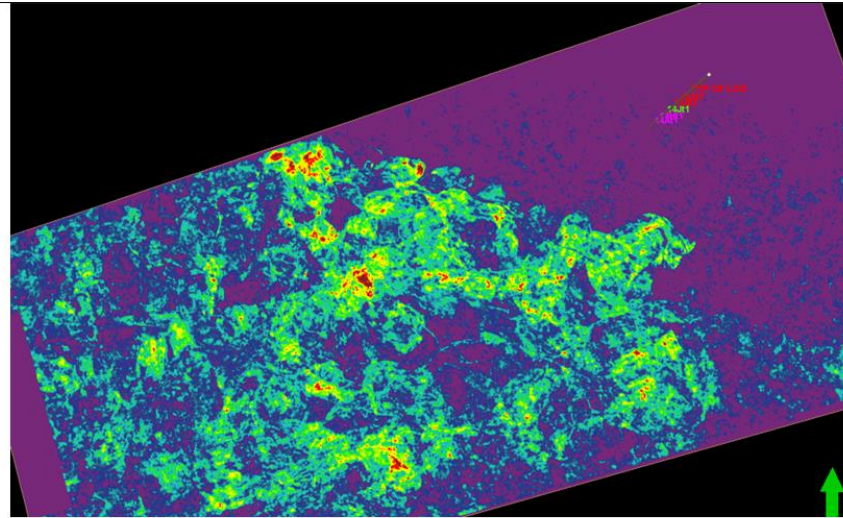
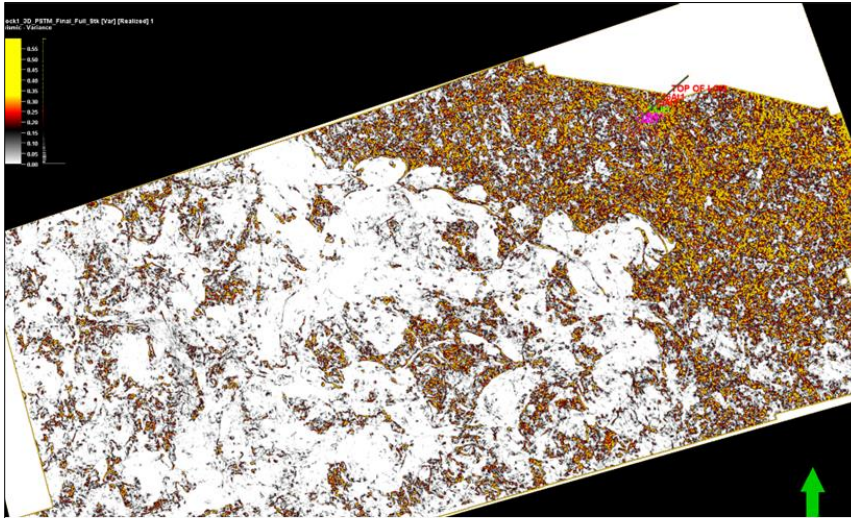


Regional 2D seismic line displaying how systems are link from the shelf to the deepwater areas

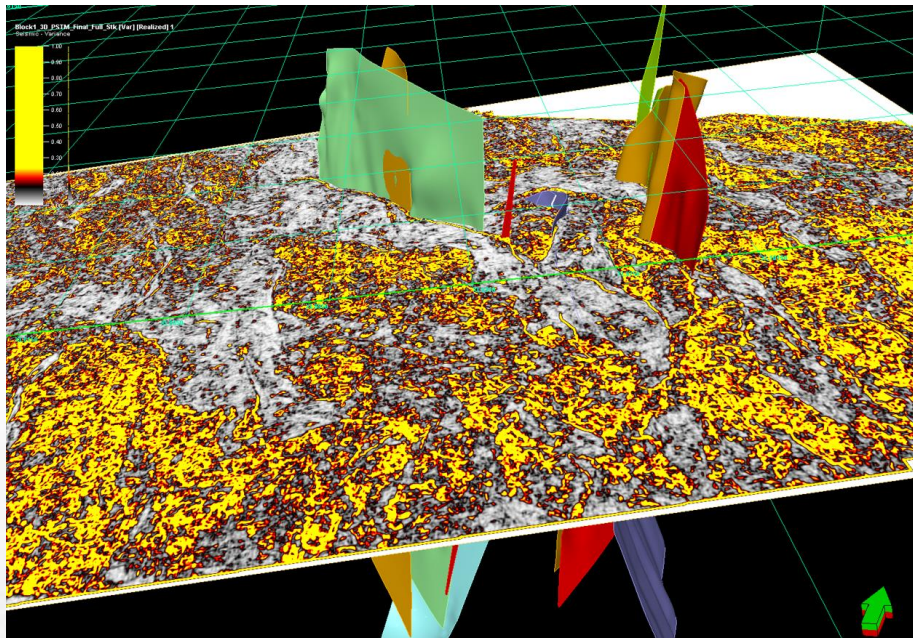
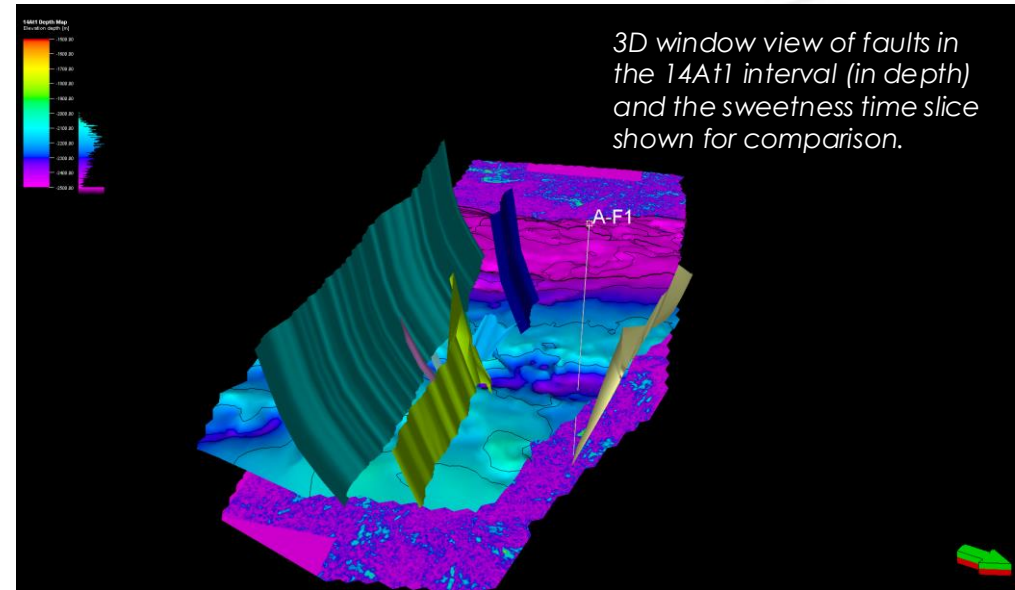
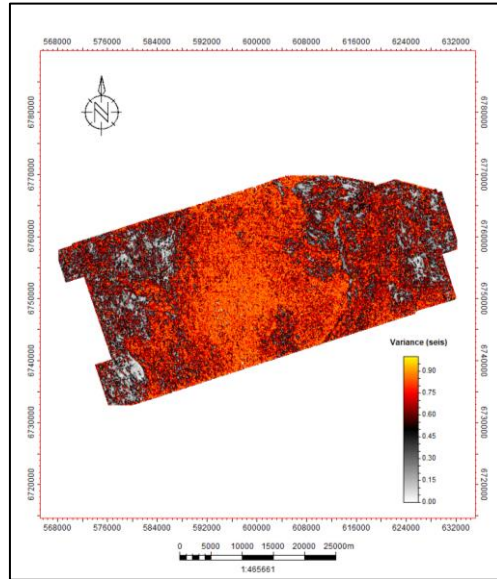
# ALBIAN CHANNEL SYSTEMS:



- Proven by A-F1 and Ibhuesi Gas Field to the South of Block 1. Comparison of Ibhuesi and Block 1 Albian channel seismic character (**Fluvial-deltaic channels**)
- Mid Aptian to Mid Albian age reservoir interval intersected in well A-F1, comprises 5 to 8m of gas-bearing channel sandstones, exhibiting porosities in the range of 22–25%. This indicates good reservoir quality, suggesting favourable production potential existing within the inboard areas of the Orange Basin.



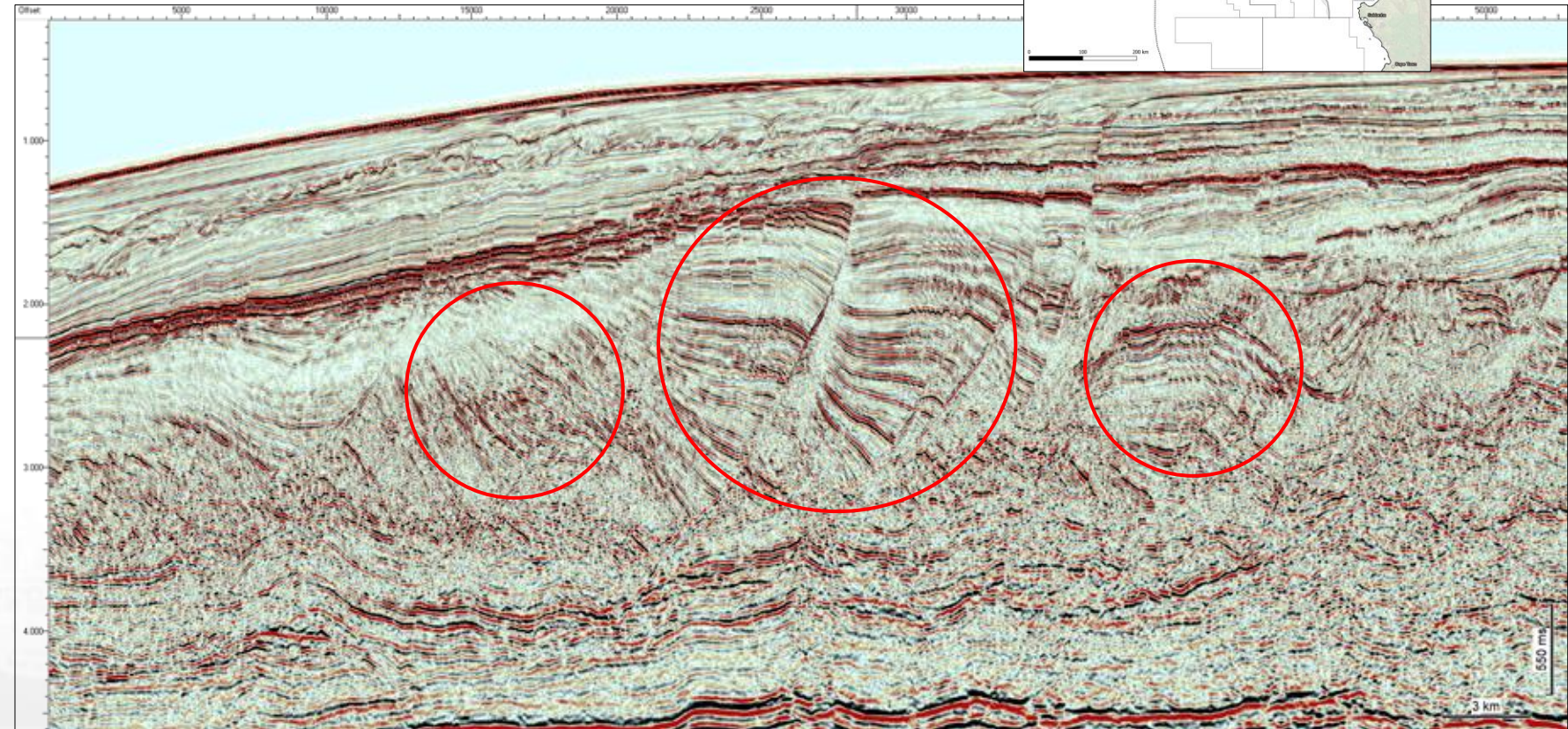
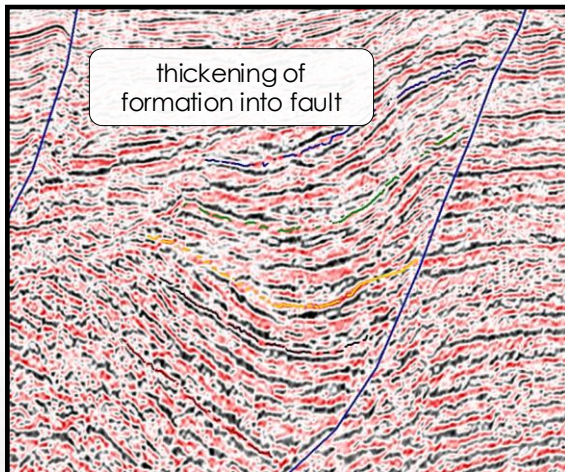
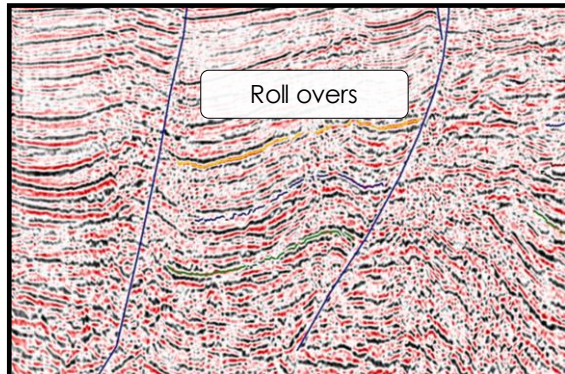
Tilted time slices taken from Variance and Root Mean Square (RMS) attributes outlining channels within the lower Aptian-Albian sequence



- Variance useful in mapping faults, channel edges and discontinuities
- Variance attribute displayed along the seismic section. Faults may influence hydrocarbon migration and trapping.
- These faults disrupted channel deposition and would compartmentalize potential reservoir sands if they are sealing. Distinct thin sinuous channels occur throughout the Cretaceous and are laterally extensive from north to south.

# PROSPECTIVITY: OUTBOARD PLAYS

Several high amplitude leads associated with growth faults (three-way closure against faults)



- **SOURCE:** Albian oil prone source and possible source rocks at Turonian level
- **MIGRATION:** Along listric faults and sandstone layers. Fault sealing potential is totally unknown
- **SEAL:** Interbedded shales and **RESERVOIR:** Turonian basin floor or slope fan sandstones

# CONCLUSIONS:



## DATA MATURITY AND PROSPECTIVITY

Existing 2D/3D seismic and legacy well control provide a re-interpretation foundation. A-F1: gas discovery; AE-1: gas shows/oil indications; AO-1: stratigraphic calibration.

## REASSESSMENT SYNTHESIS PLAY TYPES:

PROVEN → CALIBRATED → EMERGING / UNTESTED

## STRATEGIC POSITION

Adjacent to proven and emerging Orange Basin oil/gas fairways.

- The time and depth structure maps highlight adequately thick reservoirs, the presence of source rock intervals, potential migration pathways, and both stratigraphic and structural traps.
- **Block 1 spans multiple petroleum-system domains—from proximal syn-rift/inboard gas plays to distal slope and basin-floor systems**
- A-F1 Albian channels → Syn-rift graben play → Barremian play → Outboard Upper Cretaceous Deep water structural play
- Re-assessment studies reduces exploration uncertainty and aids the identification of **targets for future drilling campaigns.**
- Collectively, these results contribute valuable insights into the region's petroleum prospectivity and further reinforce **South Africa's position as an emerging destination for global energy investment.**



# THANK YOU

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