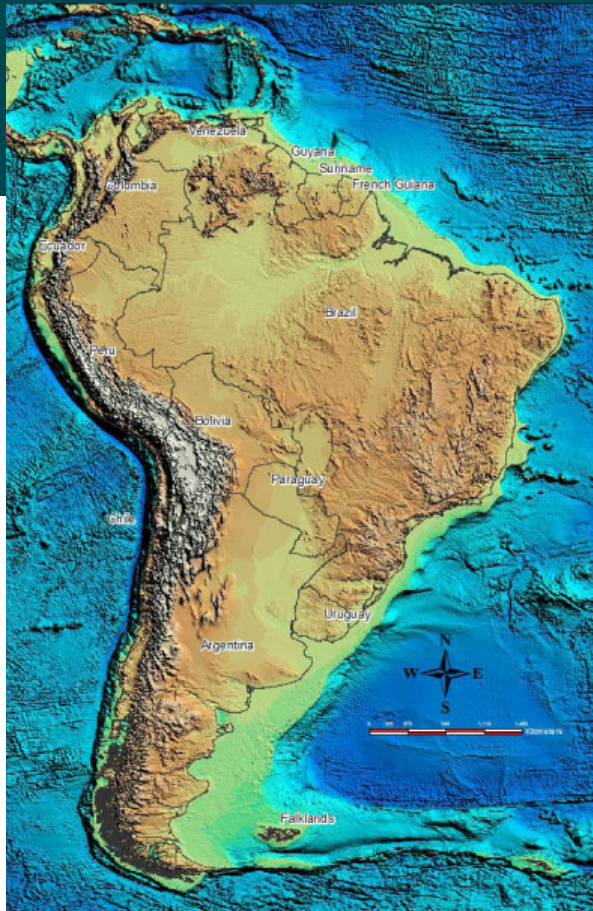


Future Exploration Potential in South America - Where Next?

Andrei Belopolsky, Premier Oil



APPEX Global 2016
London
March 2, 2016

Forward looking statements

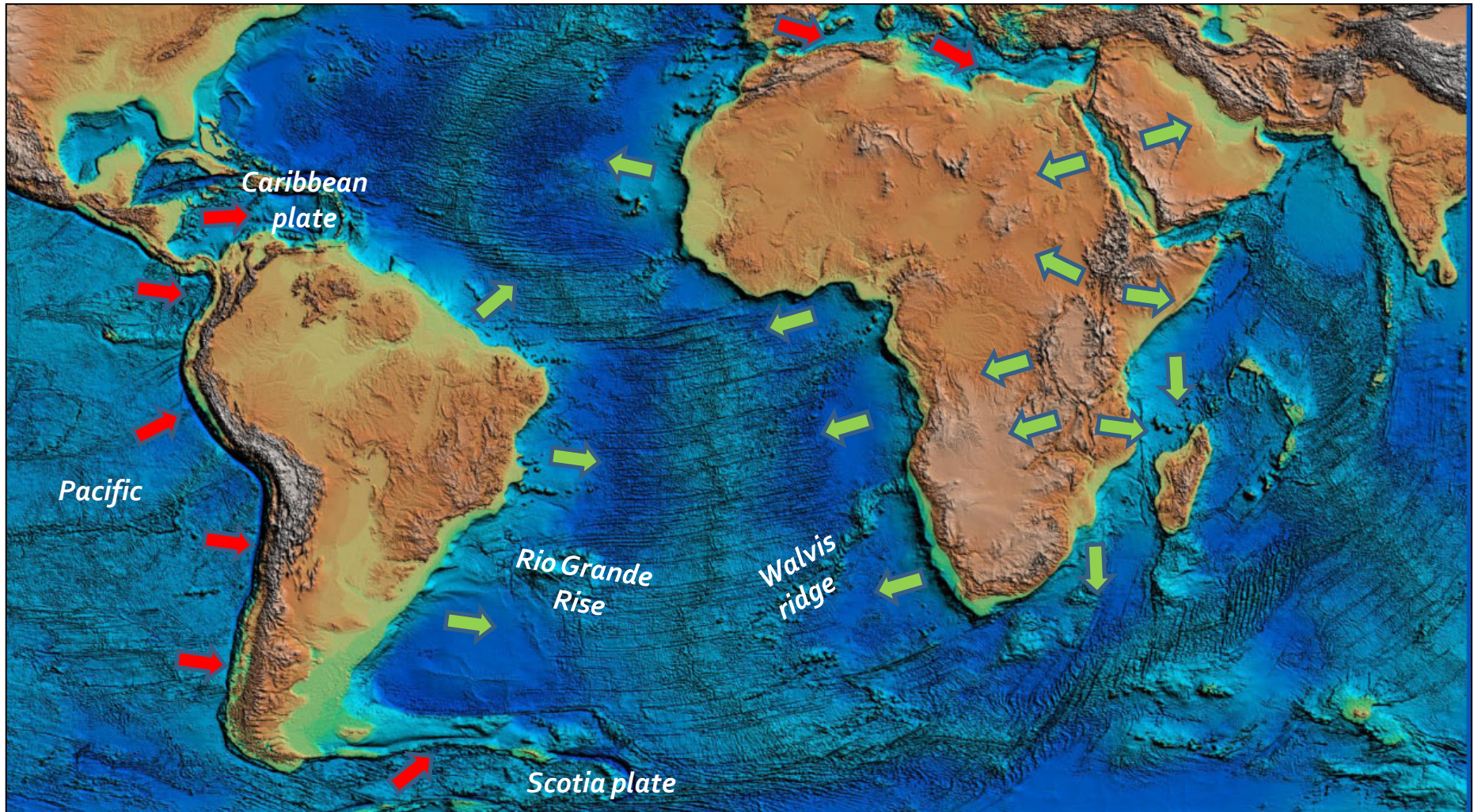
This presentation may contain forward-looking statements and information that both represents management's current expectations or beliefs concerning future events and are subject to known and unknown risks and uncertainties.

A number of factors could cause actual results, performance or events to differ materially from those expressed or implied by these forward-looking statements.

South America Exploration – Where Next?

- South America tectonic setting
- Margins, Basins, and Petroleum systems
- Recent exploration successes and failures
- Future predictions

South America vs. Africa

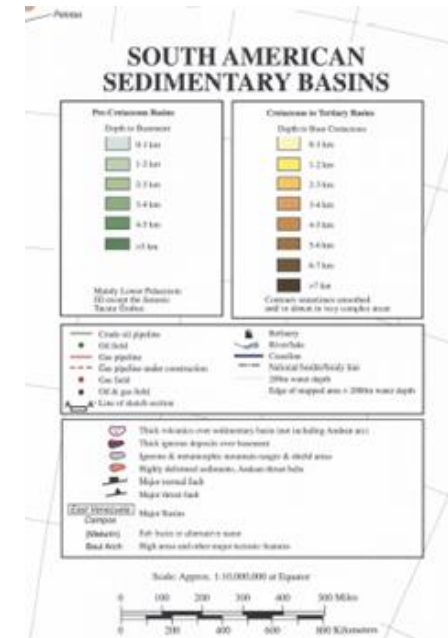
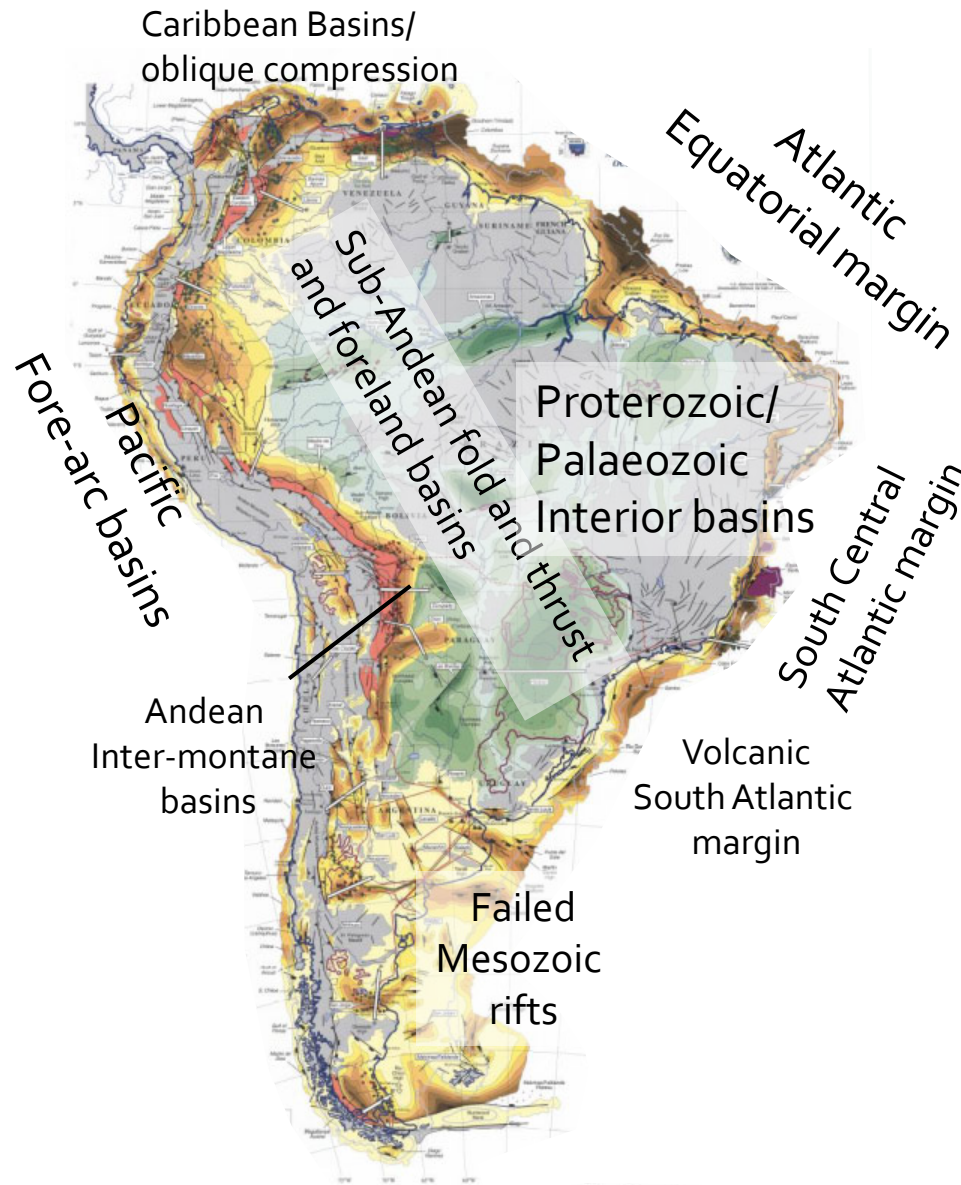


Extension



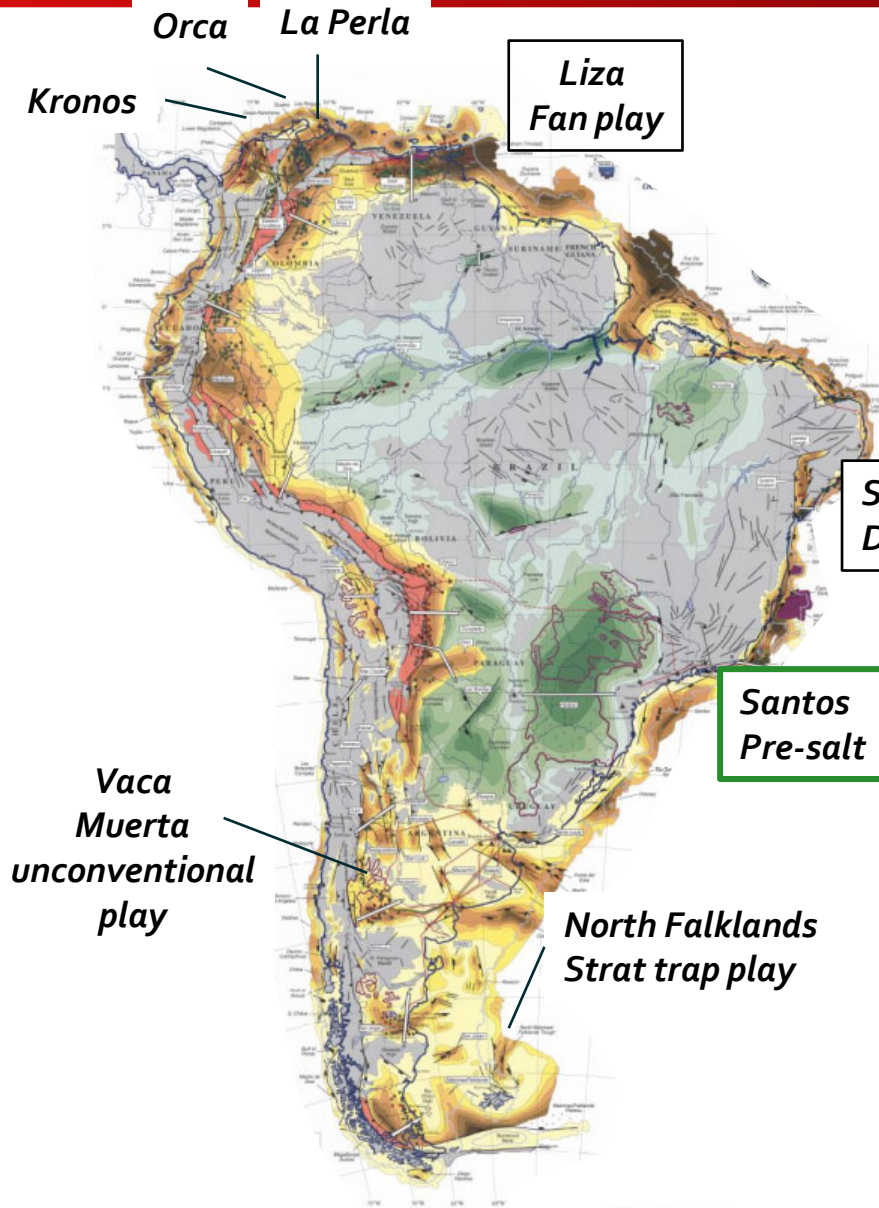
Compression/Collision

South American basins

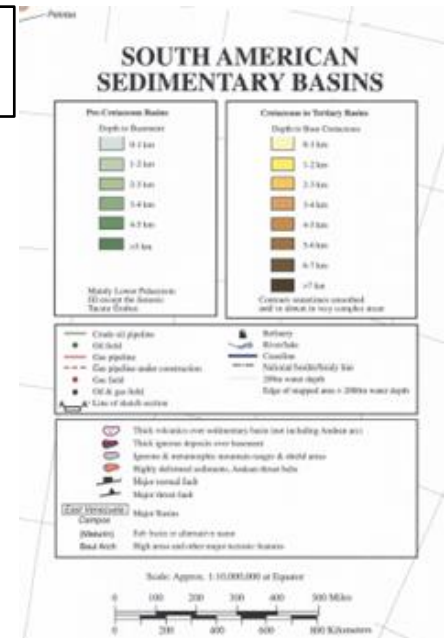


PetroSantander Map
Jerry Mathalone, 1999

Key new discoveries – last 10 years

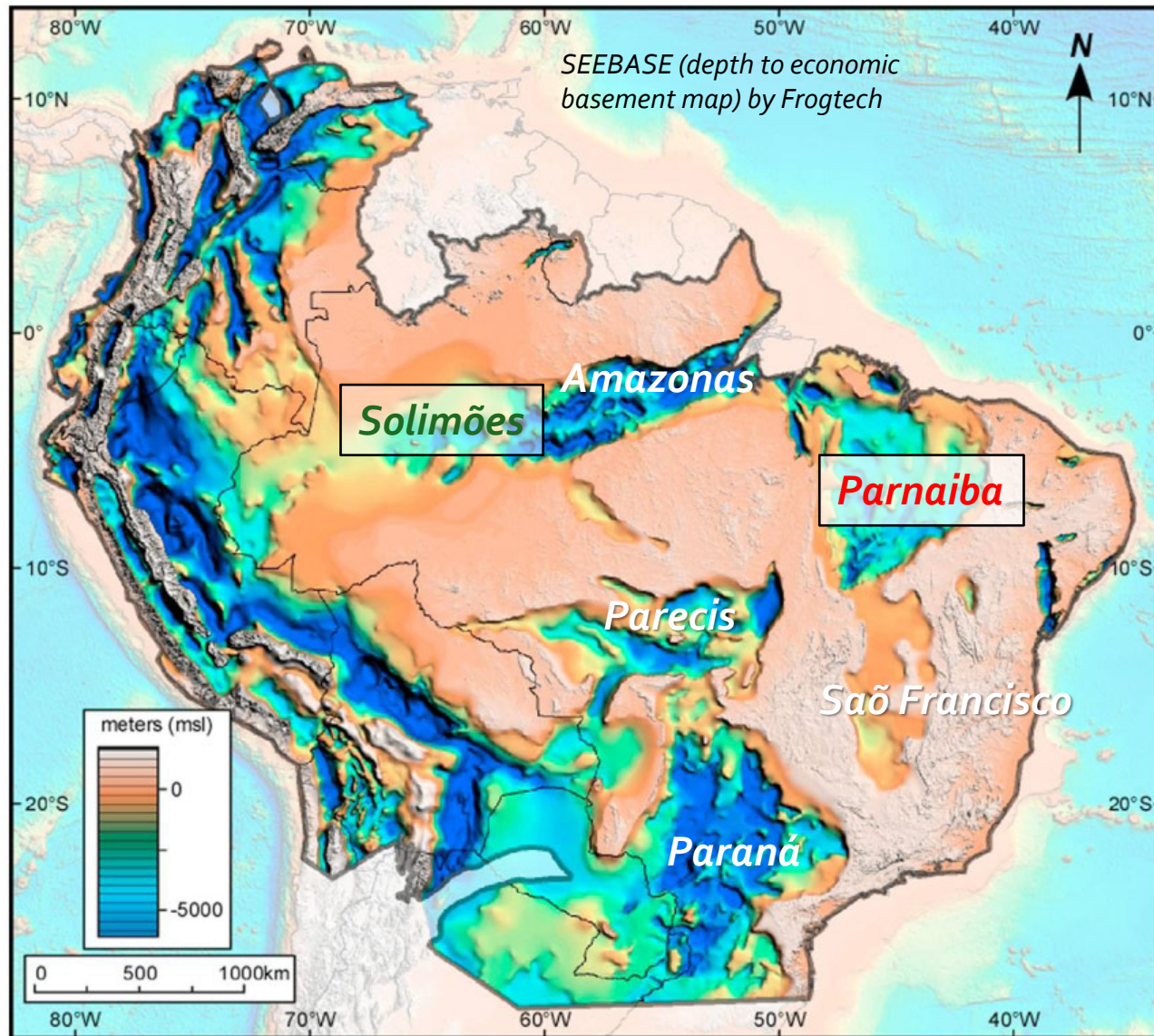


The most significant addition in terms of both resource and potential is the pre-salt discoveries in the Santos Basin of Brazil



PetroSantander Map
Jerry Mathalone, 1999

Onshore PZ basins – Northern South America



Background map from Daly et al., 2014

Neoproterozoic/ Palaeozoic basins

Good quality
PZ source rocks

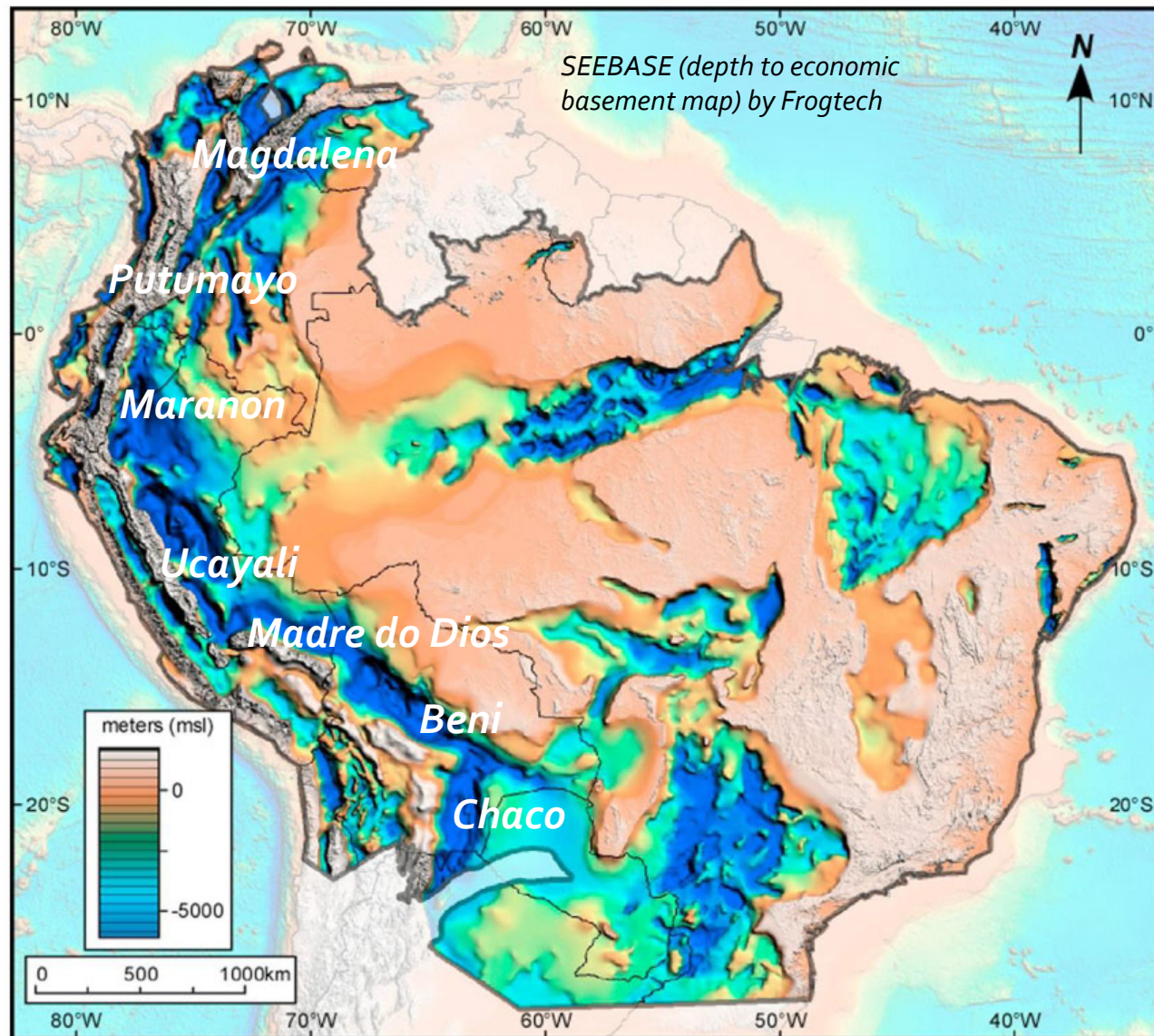
Significant uplift
and erosion

Thick overlaying
volcanics in Paraná

Discoveries and
production in
Solimões (oil and
gas) and in
Parnaíba (gas)

Proven
producing basins

Onshore basins – Northern SA – Sub-Andean Foreland



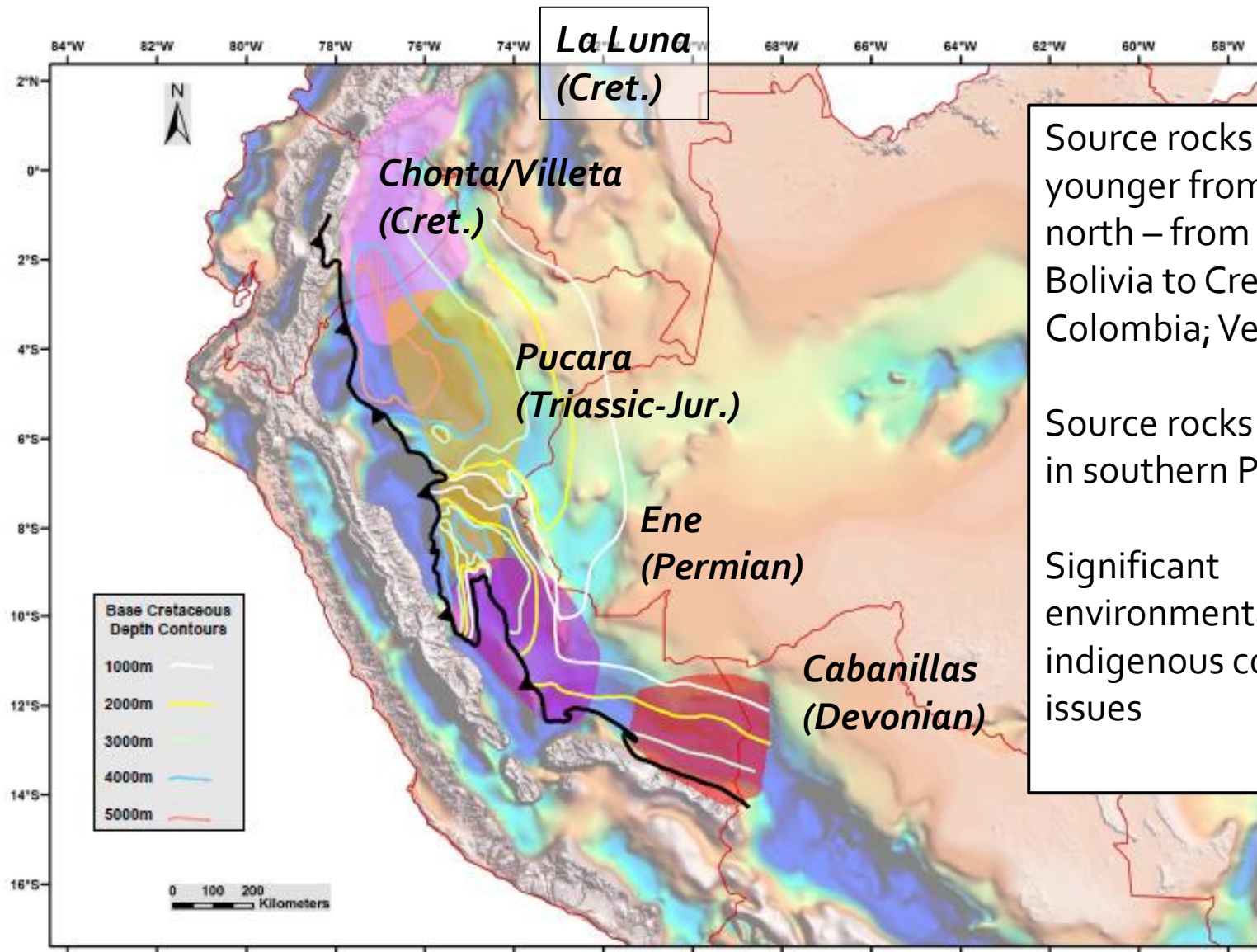
Background map from Daly et al., 2014

Sub-Andean Foreland basins

Prolific trend from Venezuela to Bolivia

Palaeozoic to Mesozoic proven Petroleum systems, older (Pz) in the south to Upper Cretaceous in the north

Sub-Andean Foreland Source Rocks

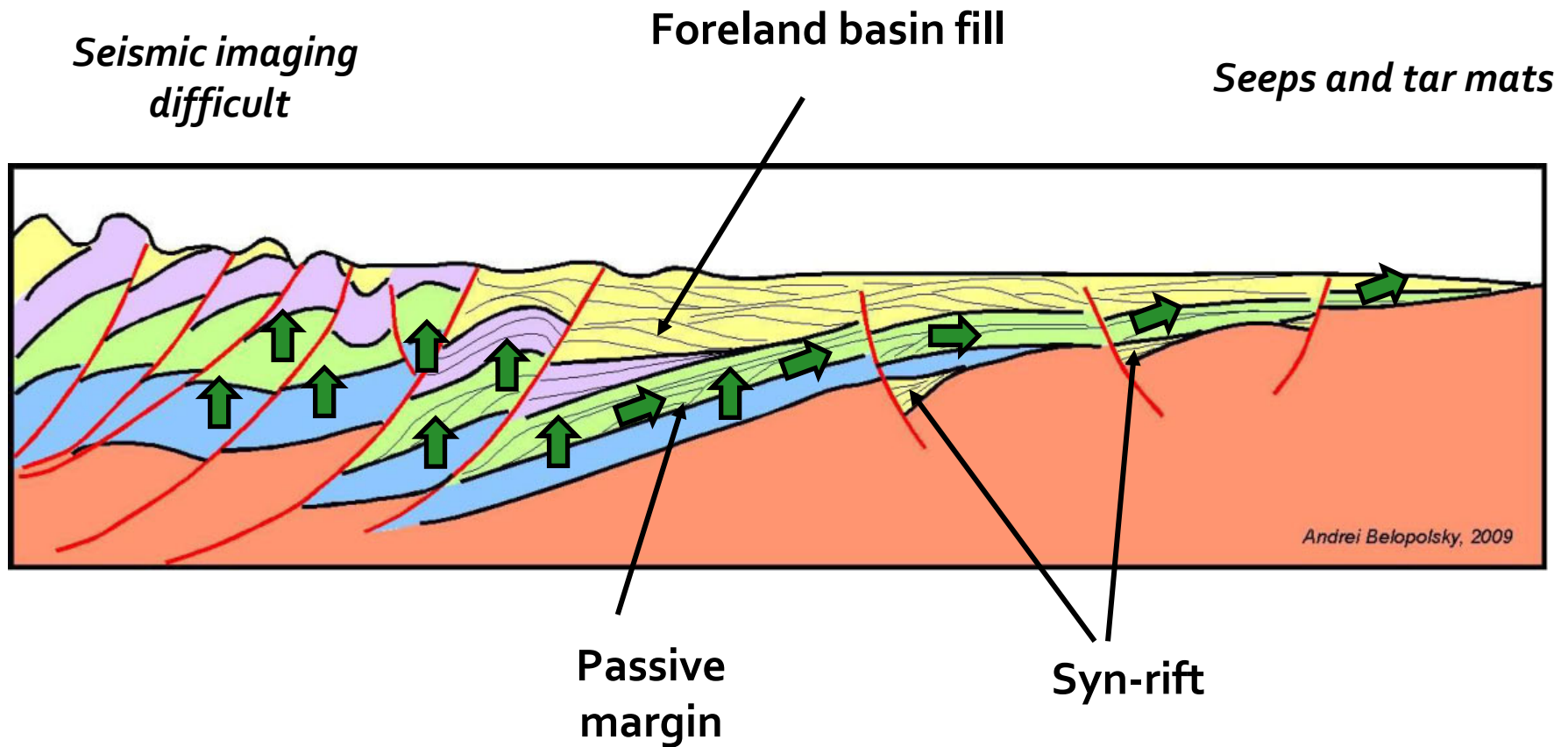


Source rocks get younger from south to north – from Devonian in Bolivia to Cretaceous in Colombia; Venezuela

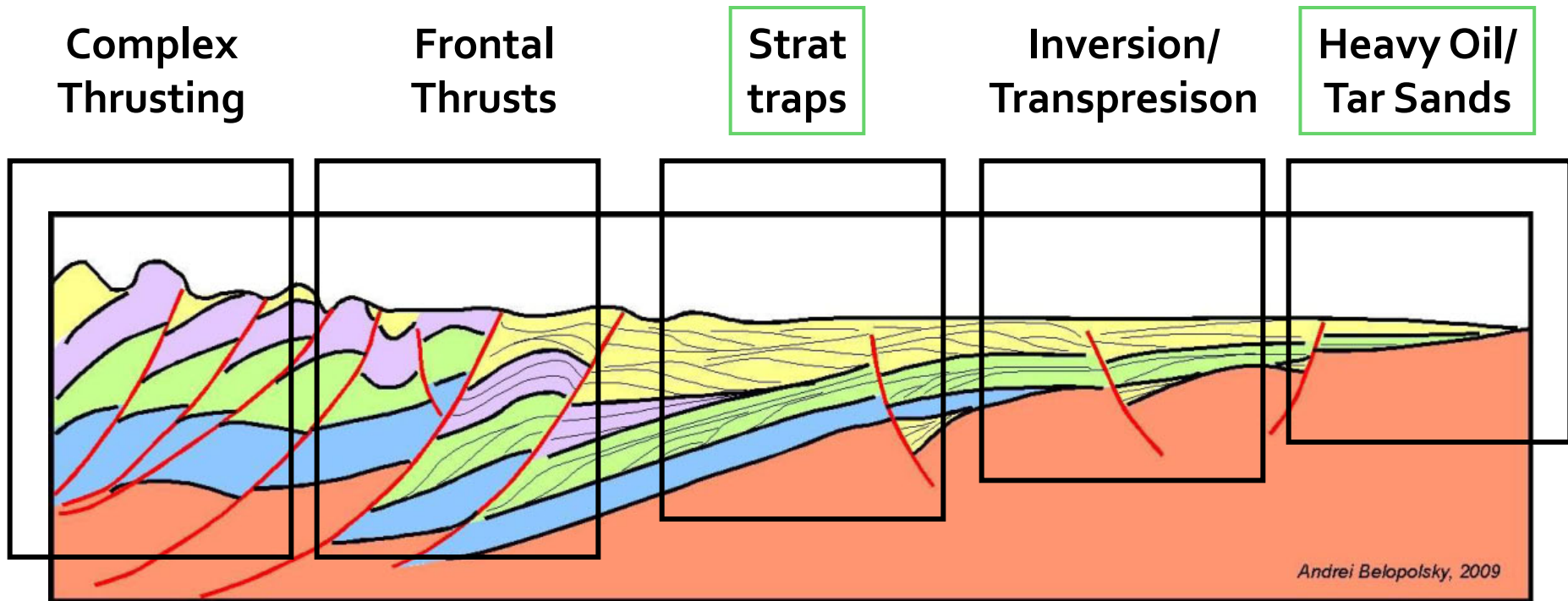
Source rocks “stack up” in southern Peru

Significant environmental and indigenous community issues

Idealized cross section through a fold & thrust belt and a foreland basin



Idealized cross section through a fold & thrust belt and a foreland basin



Future potential:



Bolivia

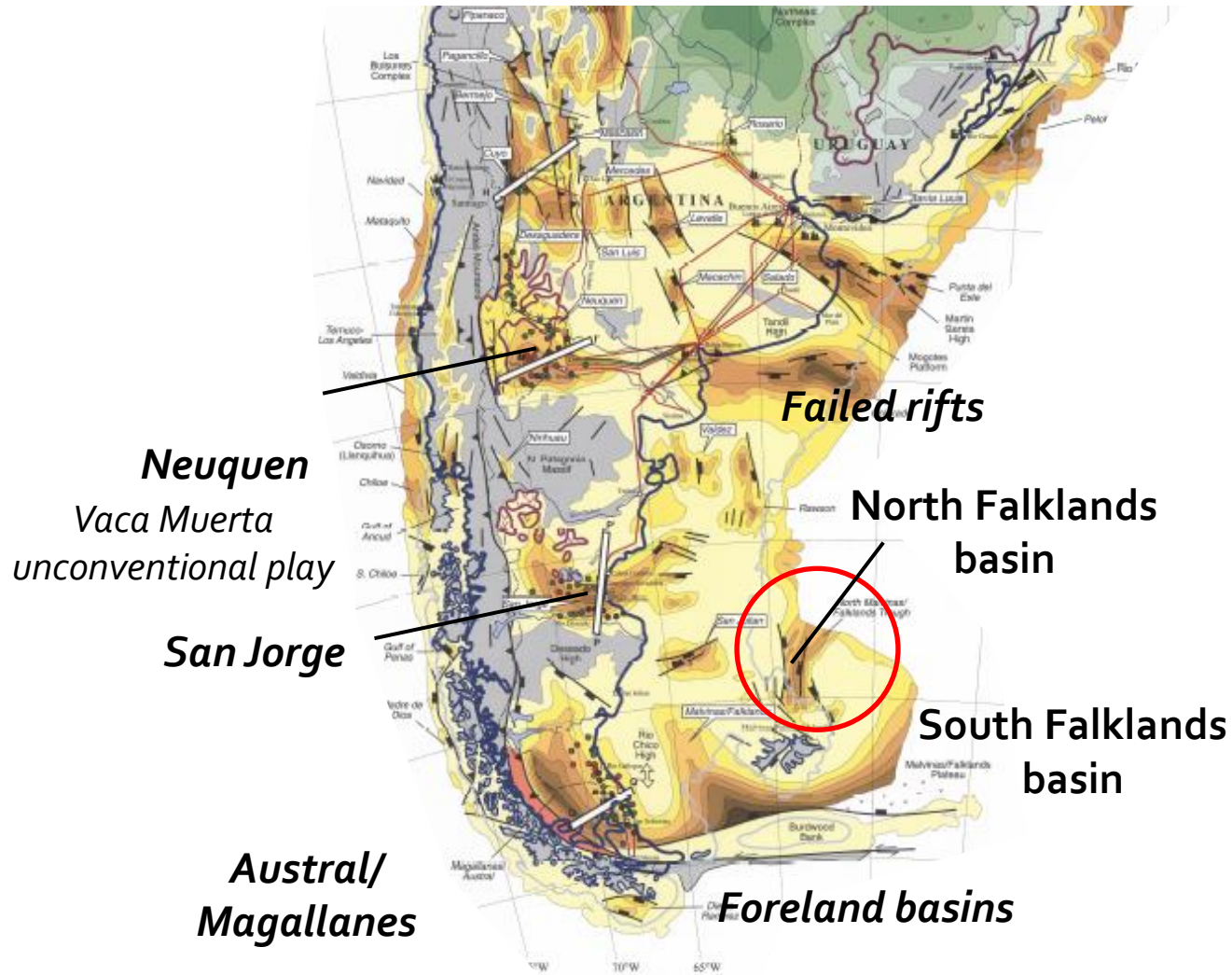
Peru

*Venezuela
Colombia*

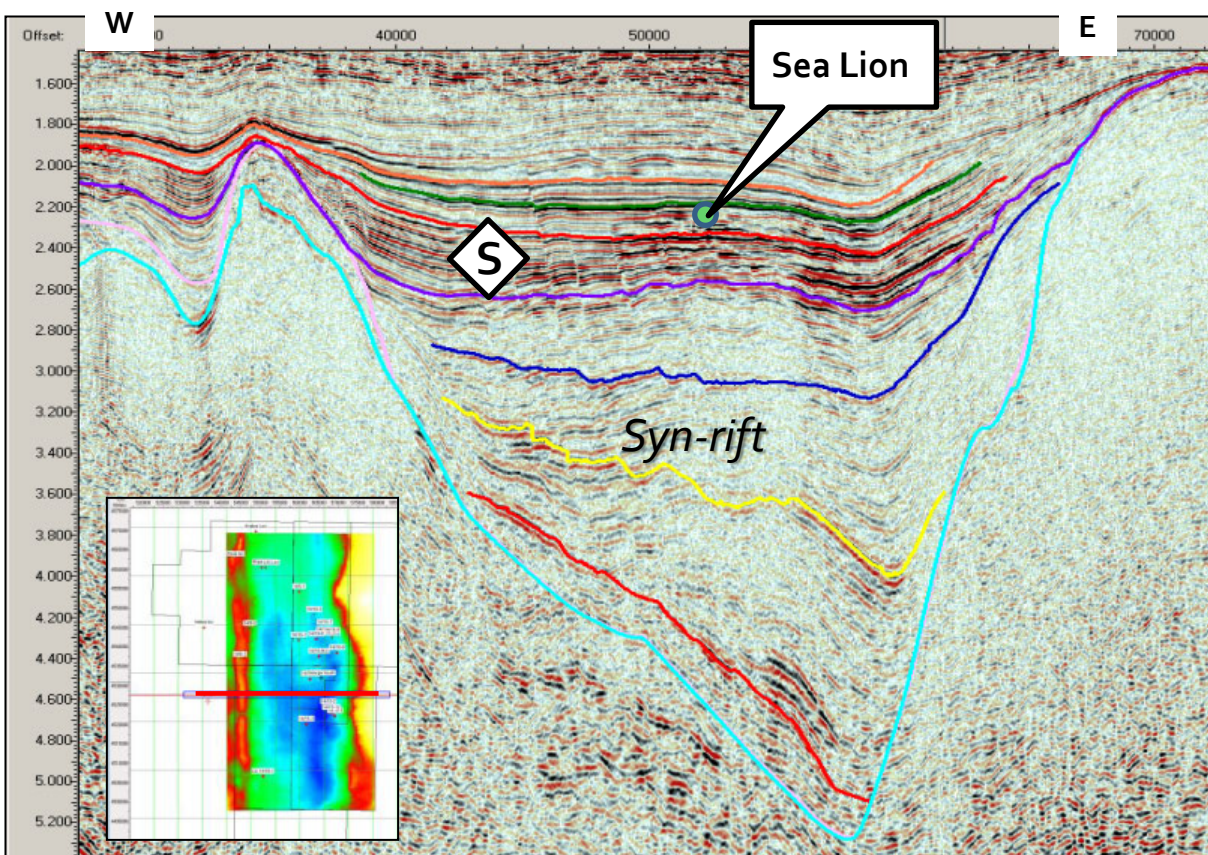
Challenges

Terrain, indigenous communities, environmental sensitivity, politics

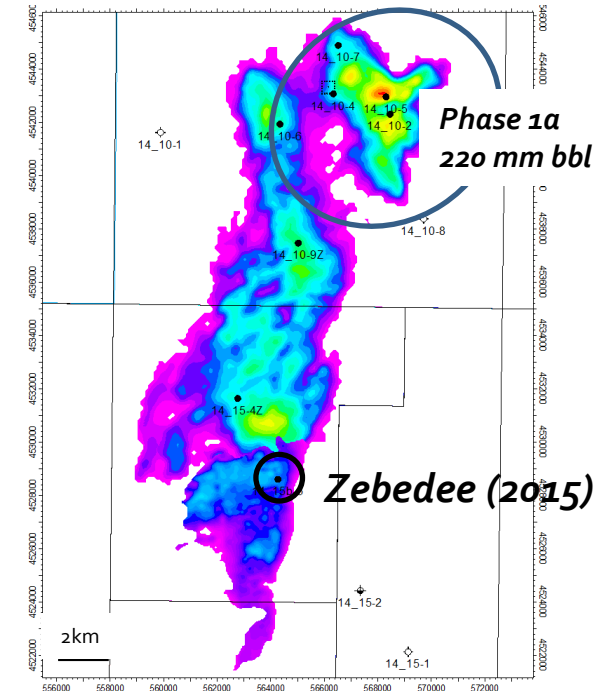
Southern Cone basins



North Falklands Basin (NFB) – Sea Lion Discovery (2010)



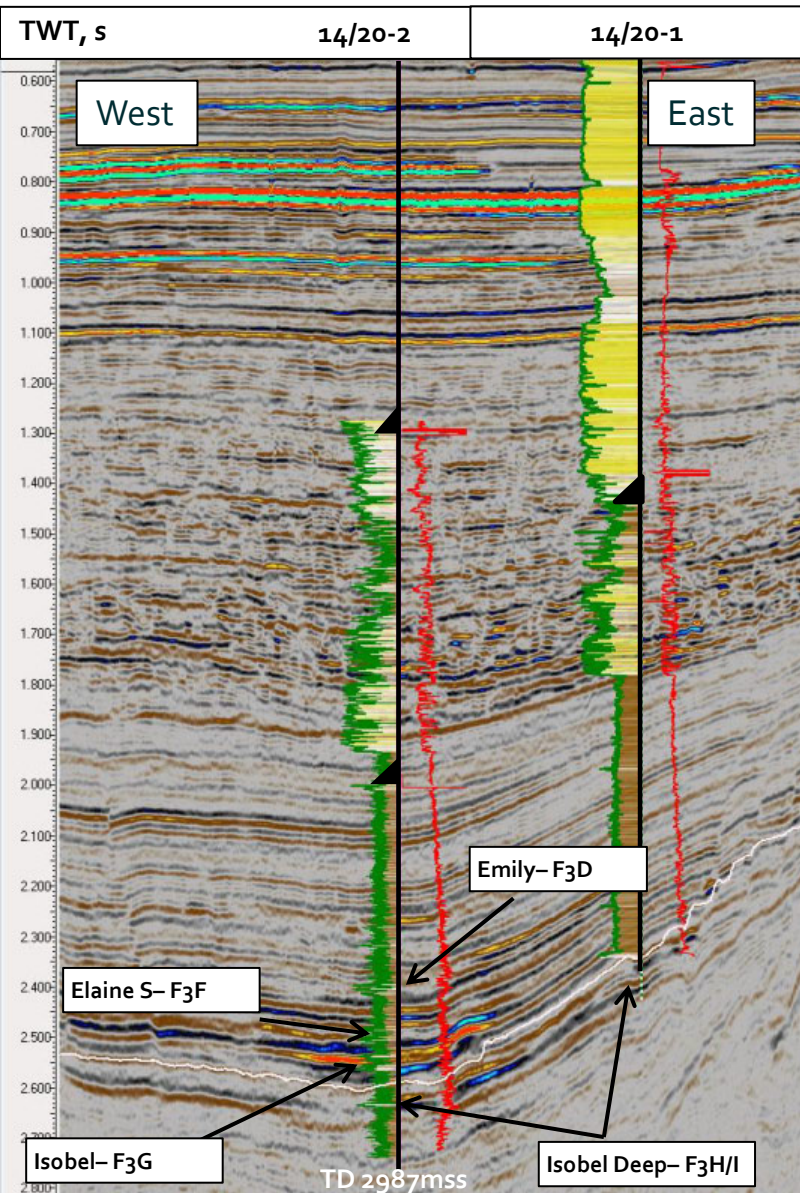
Sea Lion discovery Hydrocarbon pore volume



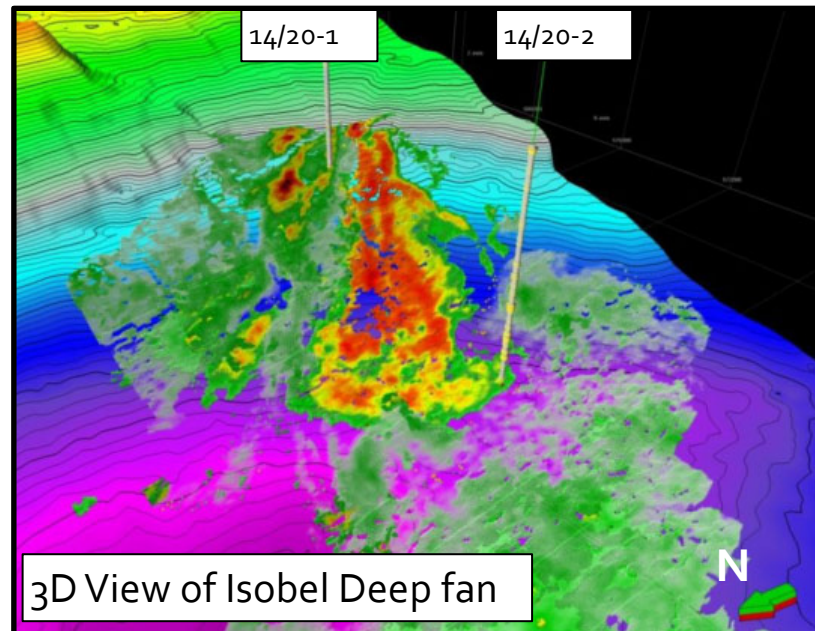
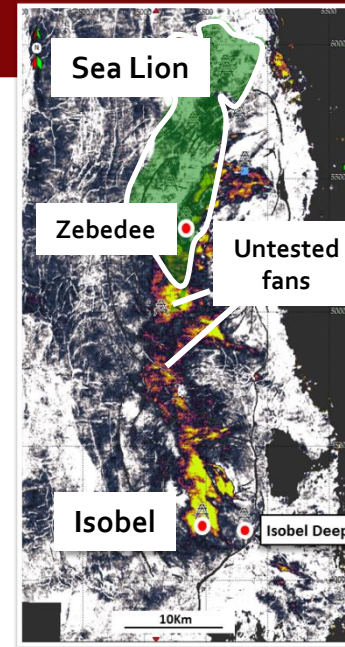
- Lower Cretaceous rift with ~8km of fill
- 700m thick post rift lacustrine sequence
- Word class source rock with intercalated lacustrine fans
- Excellent quality reservoir

- Phase 1a development targets 220mmbls in the NE&NW of PL032
- 2015 exploration success at Zebedee has increased Sea Lion area resource base

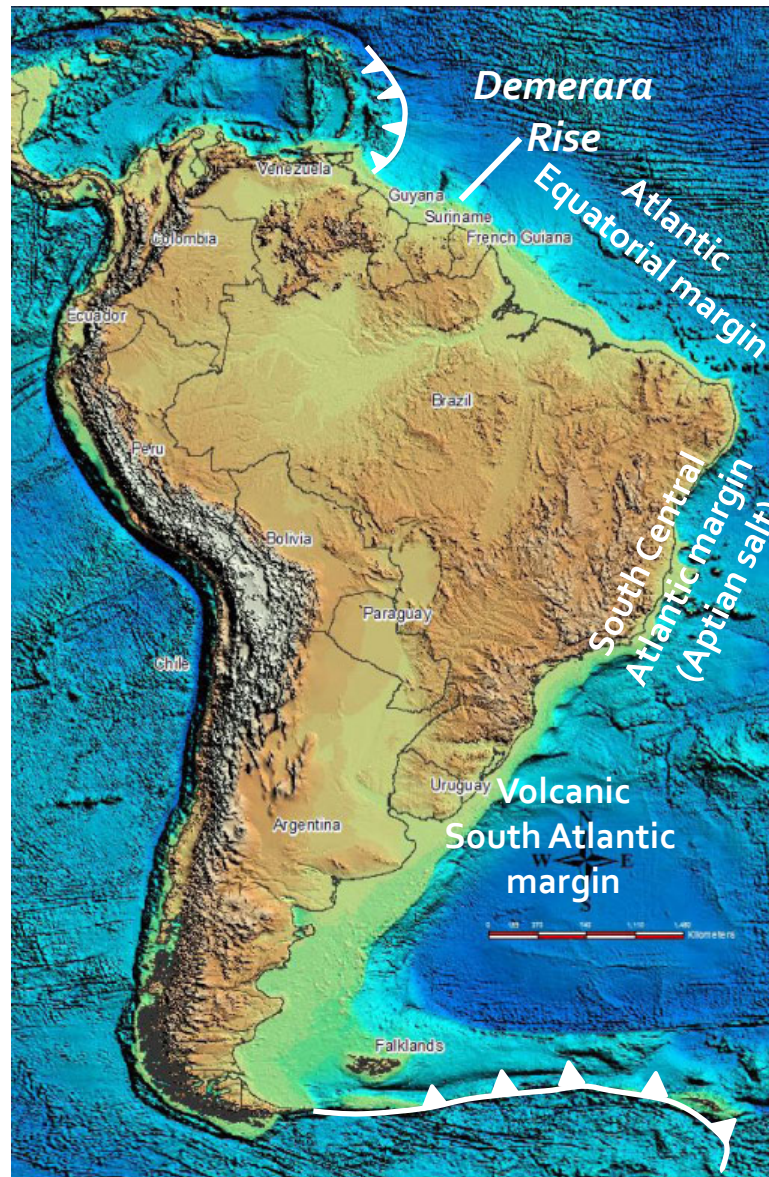
Isobel Deep Discovery (2015)



- Two well successfully found oil-bearing Isobel Deep sandstones over 350 metres interval
- Discovered multiple additional oil-bearing sandstones in shallower layers
- No oil-water contacts were encountered in the well
- Further upside remains associated with this feeder system. Significant inventory of feeders and fans of fans remain untested



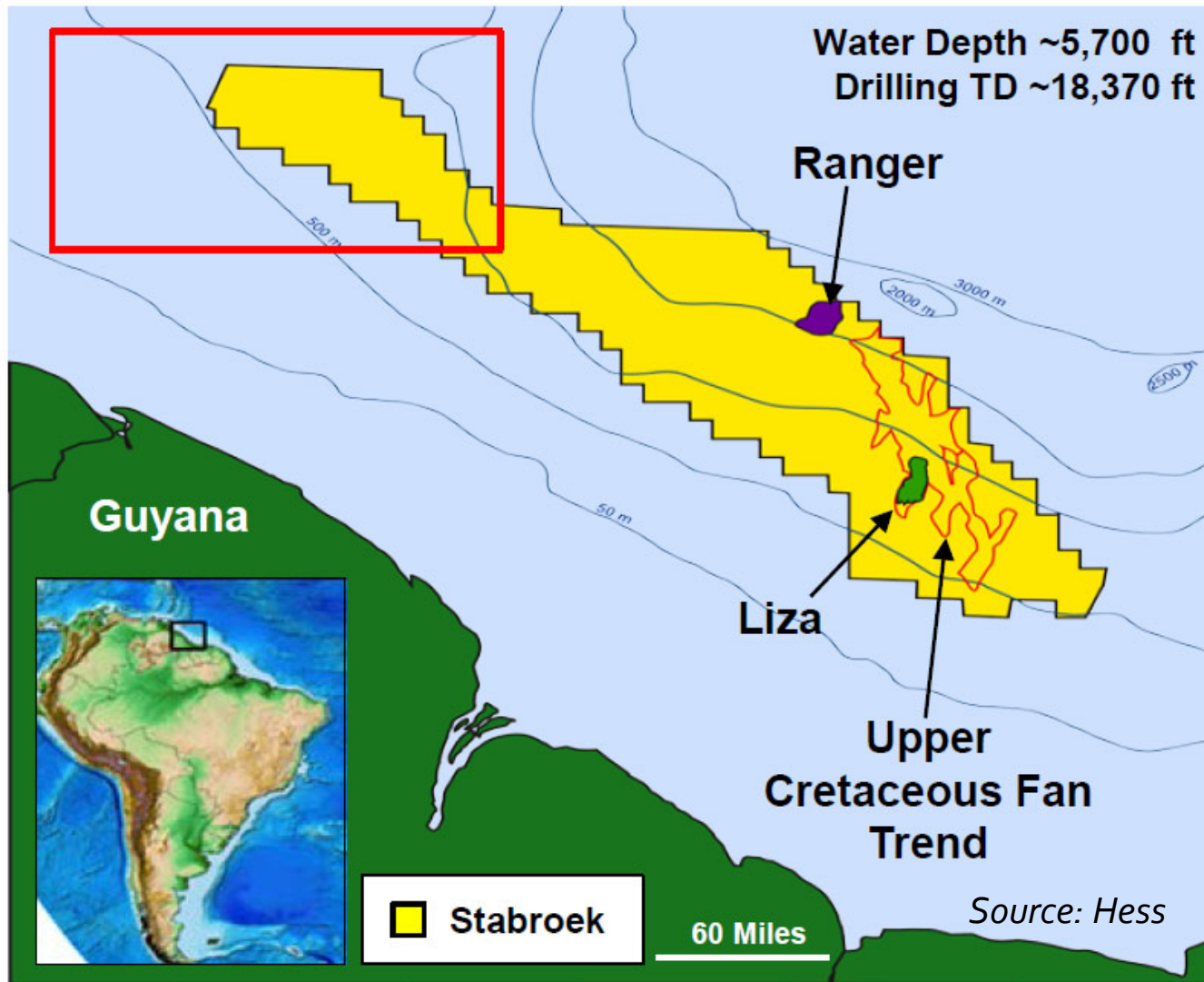
South Atlantic Offshore Margins



Pernambuco

**Rio Grande
Rise**

Guyana - Suriname Basin – Liza discovery (2015)



- Esso 45%, Hess 30%, CNOOC Nexen 25%
- Liza-1 encountered 295 feet of high-quality oil bearing sandstones
- Discovery is being appraised
- Question of size/value?
- Suriname – recent non-commercial oil wells

 GoM Green Canyon for scale

South Atlantic – Brazil Equatorial margin

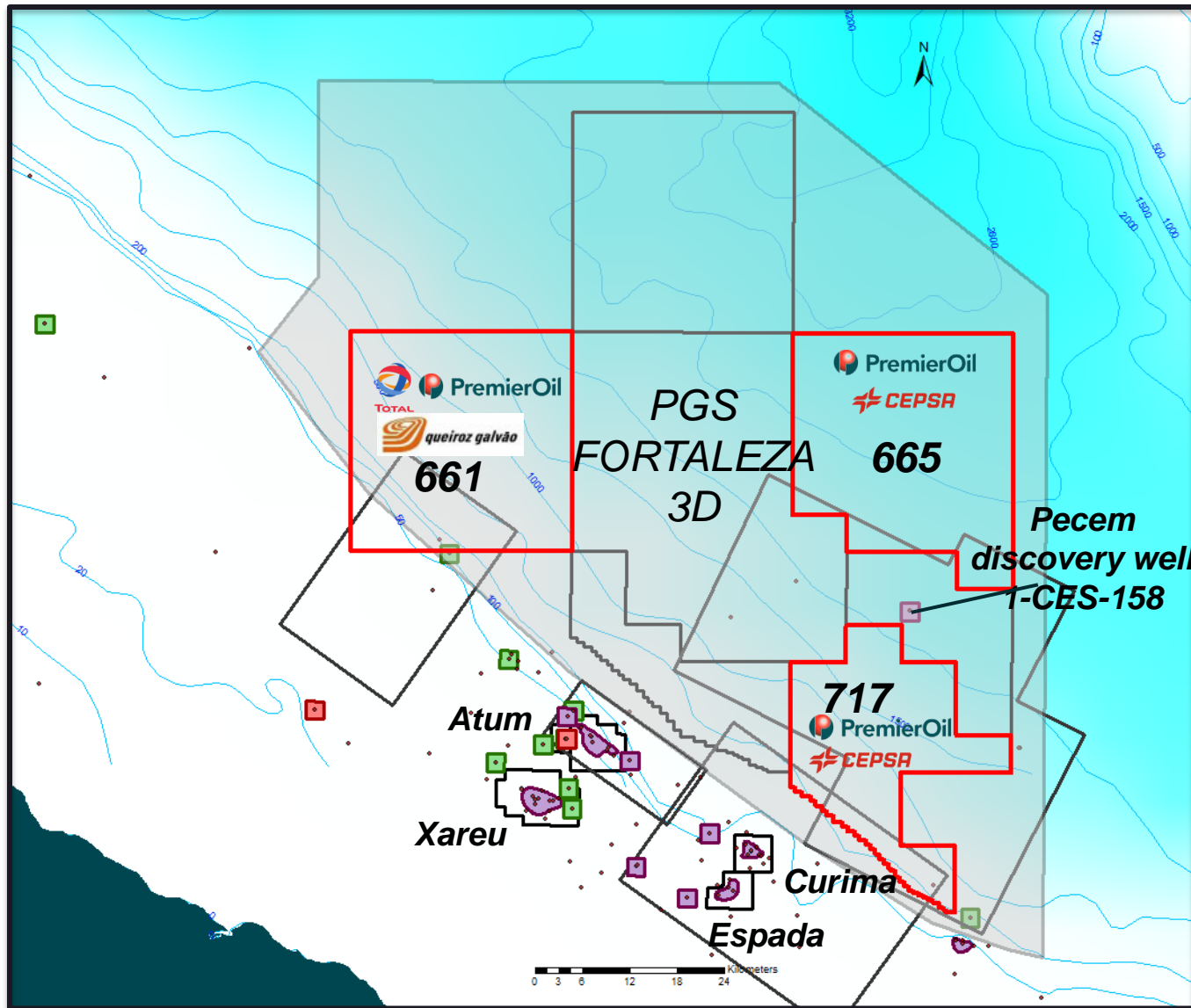
Significant number of licences awarded in the 11th bid round (2013) with heavy well commitments (27 total)

Delays related to the environmental licencing for seismic acquisition led to licence extensions

Discoveries in syn-rift/transitional reservoirs in Ceará and Potiguar and Cretaceous turbidites in French Guyana



Ceará Basin

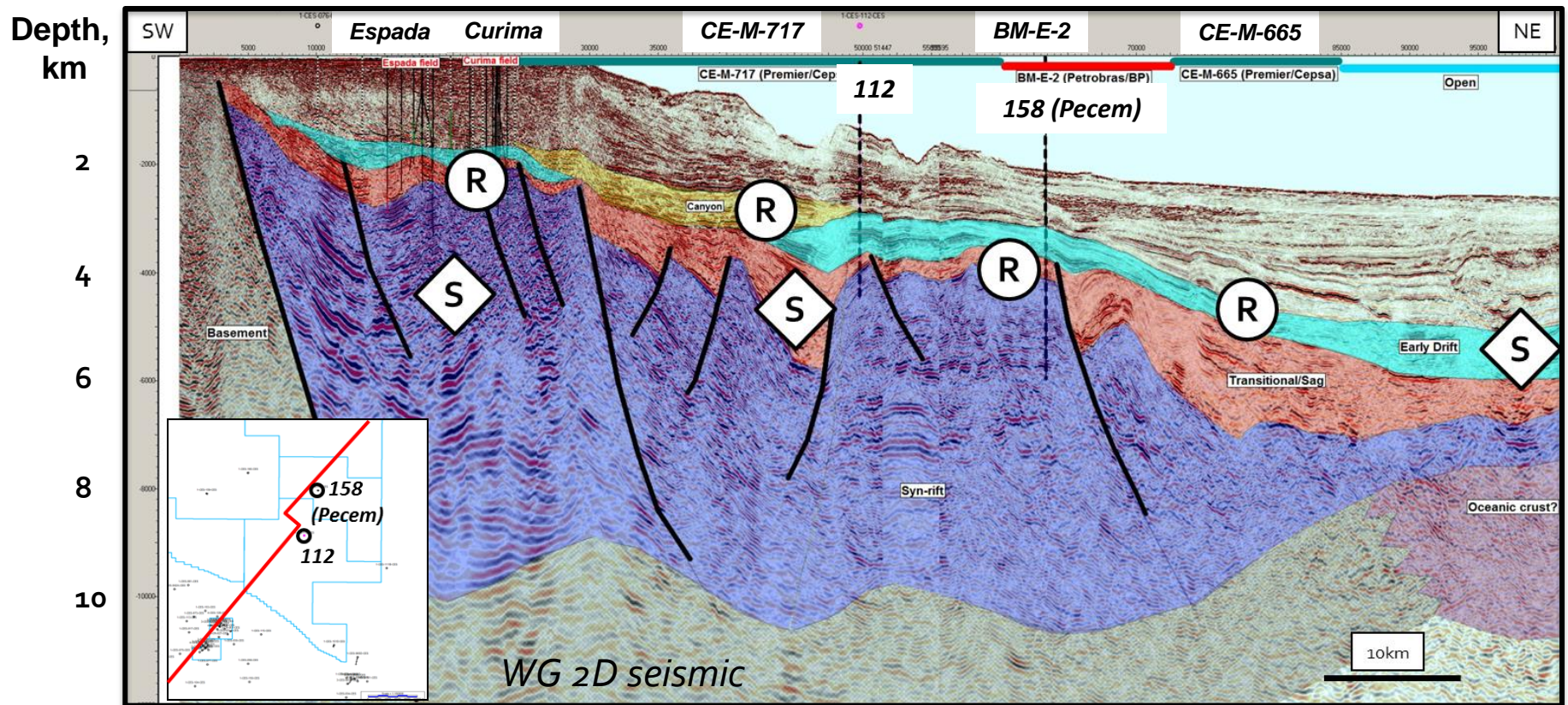


Premier Oil was awarded blocks CE-M-717 and CE-M-665 as operator with partner CEPSA (50%) in 2013

Premier farmed into block CE-M-661 in 2015

PGS has acquired 7000 km² of multi-client broadband 3D in late 2015

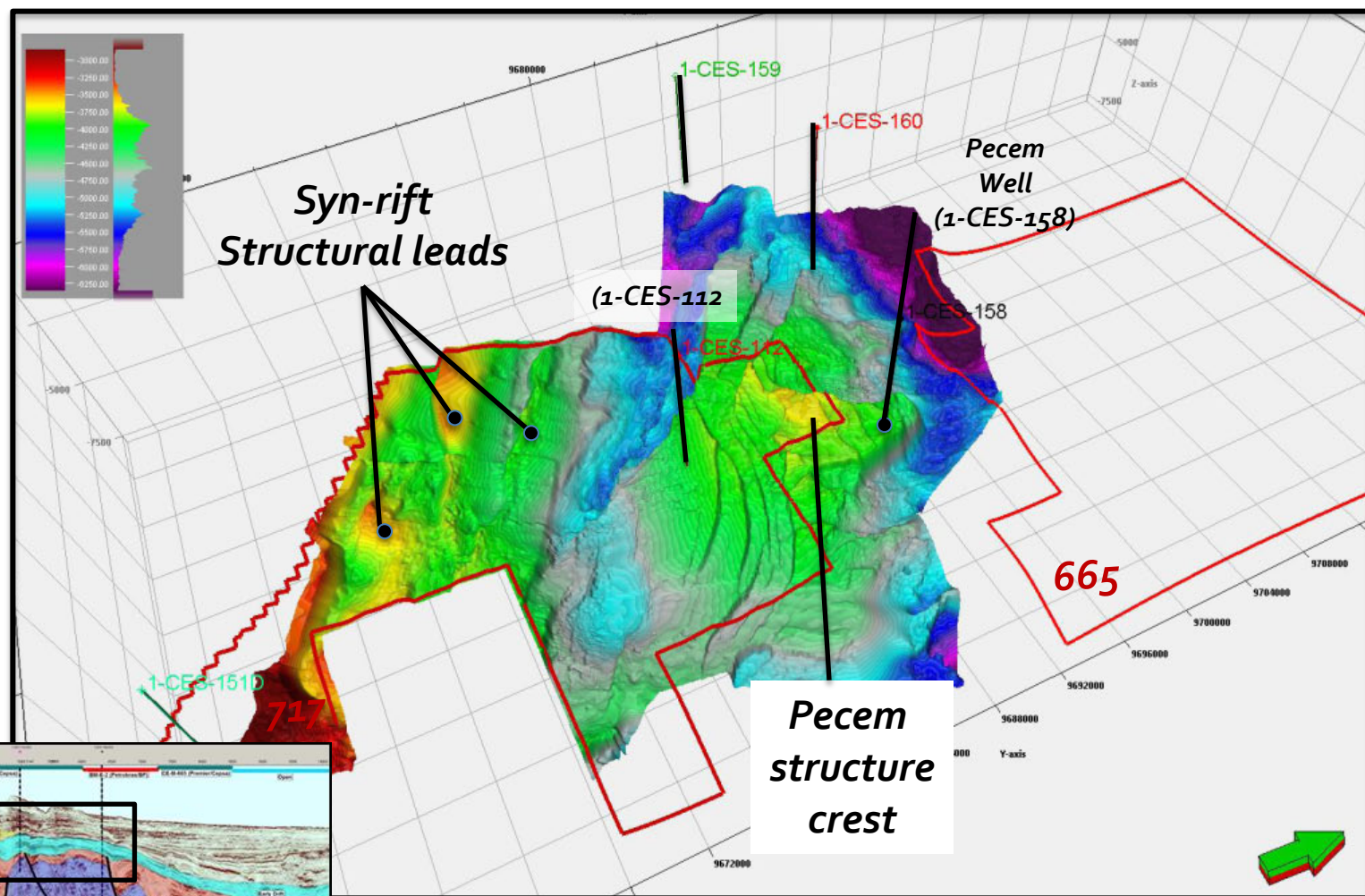
Ceara Basin – Play Diagram



Several excellent source rock, two (Albo-Cen and Trairi) are world-class

- 1. Turonian – Marine source - Oil prone
- 2. **Albo-Cenomanian** – Marine source - Mixed oil and gas
- 3. **Apto-Albian Trairi Member** - Marine carbonate, evaporite, lacustrine - oil-prone
- 4. Pre-Trairi Paracuru or Mundaú Fmn - Lacustrine - gas

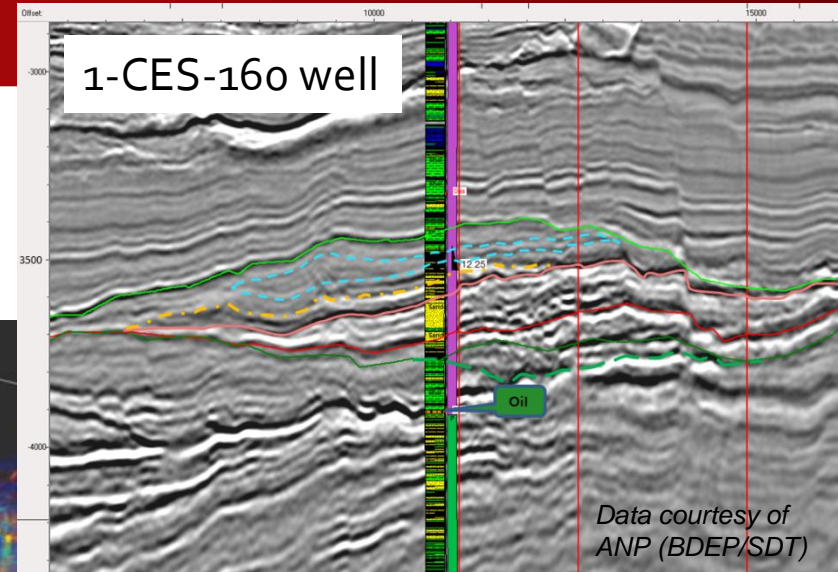
Syn-rift Leads – “Top Trairi” structure map



Interpretation of the merged/reprocessed CGG/PGS 3D

Drift play – Cretaceous channels

1-CES-160 well



- Gross Thickness: 260m
- N/G: 80
- Porosity: 22-23%
- Permeability: 10s-100smD
- Oil in basal conglomerate

Berimbau channel

Pecem High

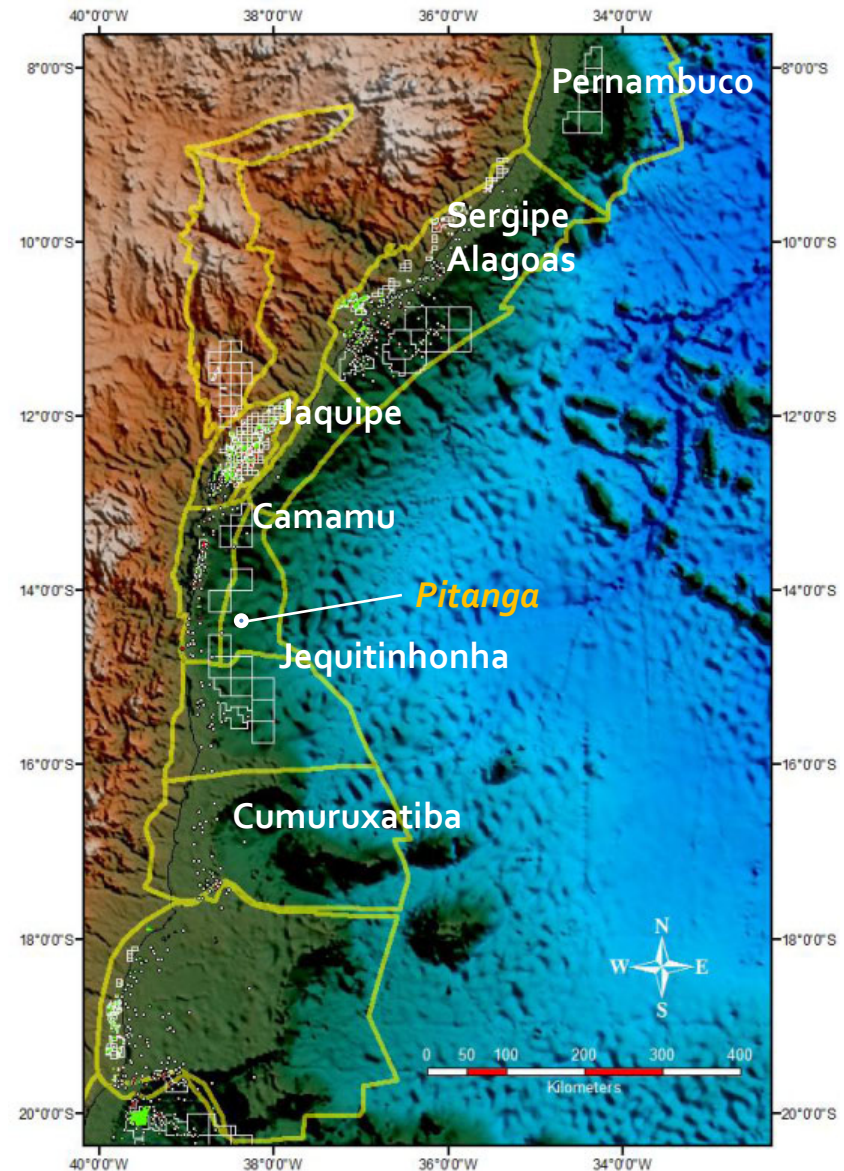
Repinique channel

N

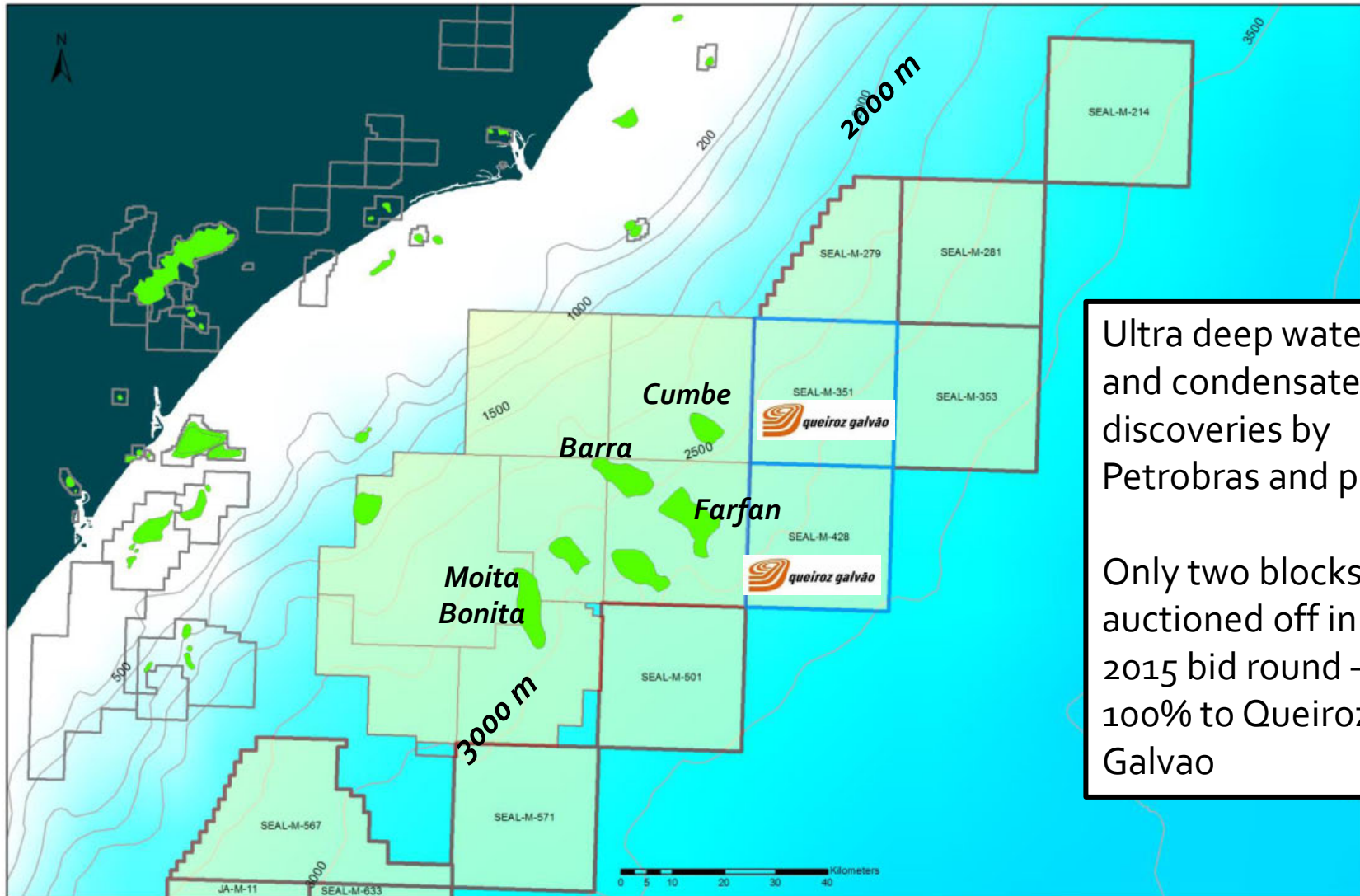


Central South Atlantic basins

- Sergipe oil and condensate discoveries by Petrobras – Barra, Moita Bonita, Farfan
- Camamu basin - Pitanga well (BP, 2013) – dry
- 2015th Brazil bid round – only two blocks awarded offshore – SEAL-351 and SEAL-M-428 in Sergipe, 100% QGEP
- Environmental permitting is long and complex process controlled by IBAMA – Jequitinhonha and Cumuruxatiba licences are suspended



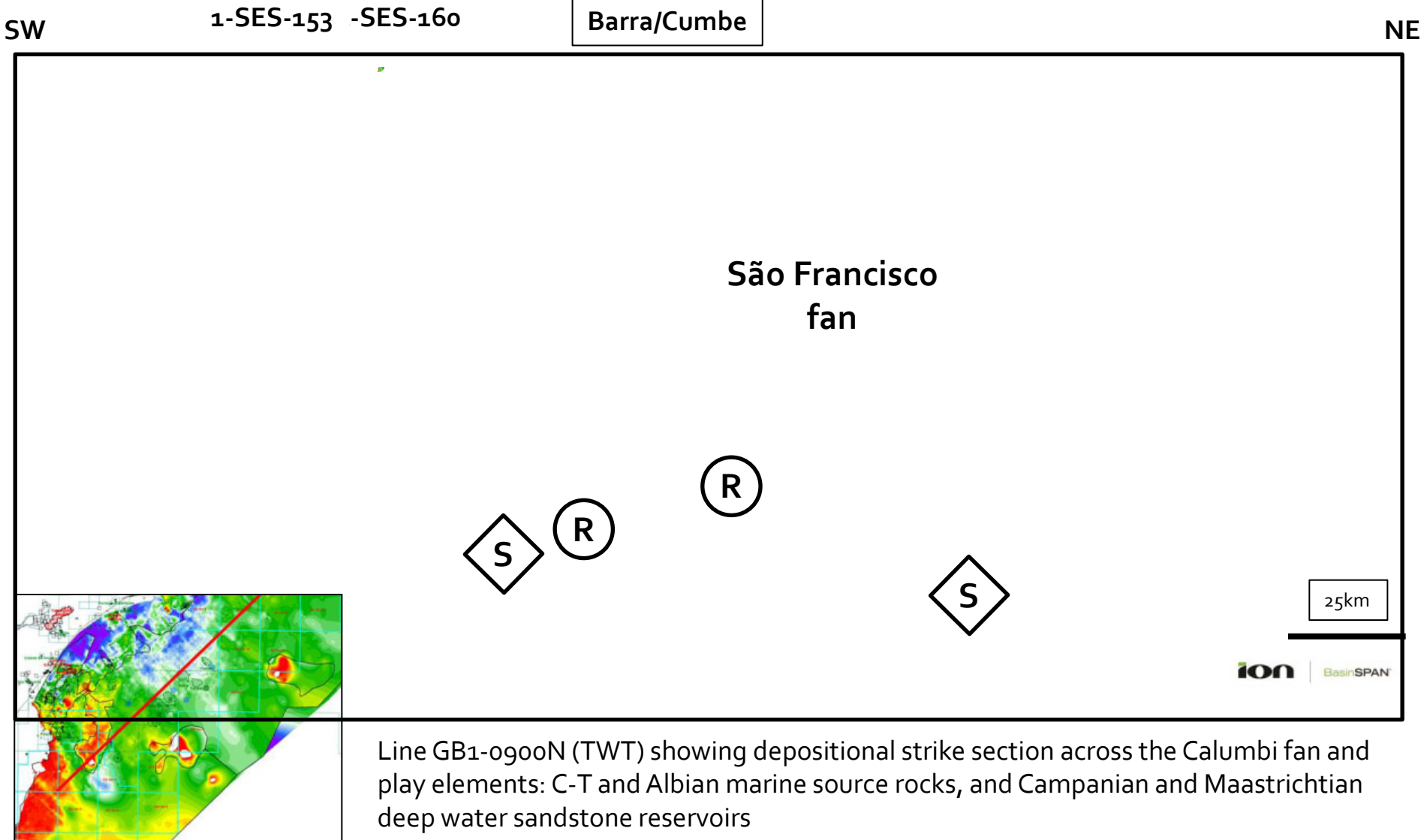
Sergipe basin- ultra-deep water discoveries



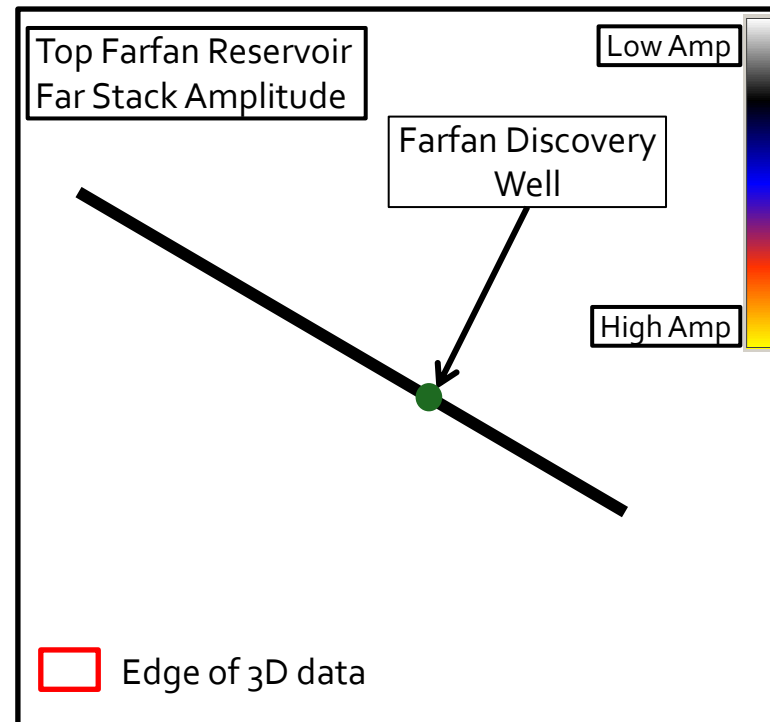
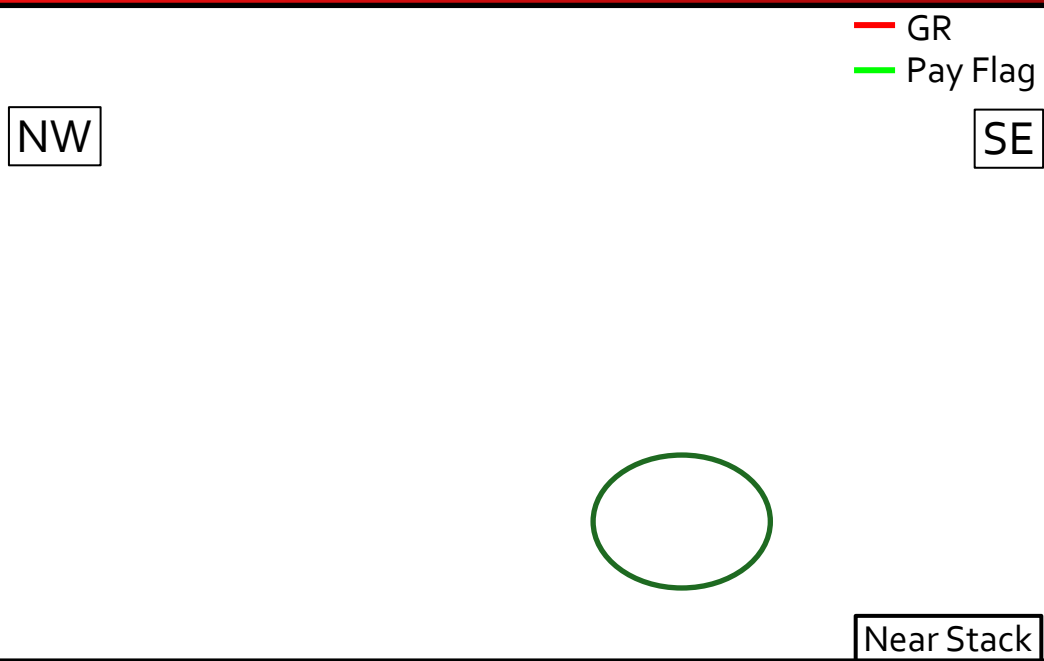
Ultra deep water oil and condensate discoveries by Petrobras and partners

Only two blocks auctioned off in the 2015 bid round – both 100% to Queiroz Galvao

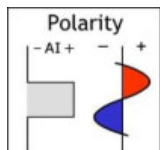
Regional strike geoseismic line – Sergipe Basin



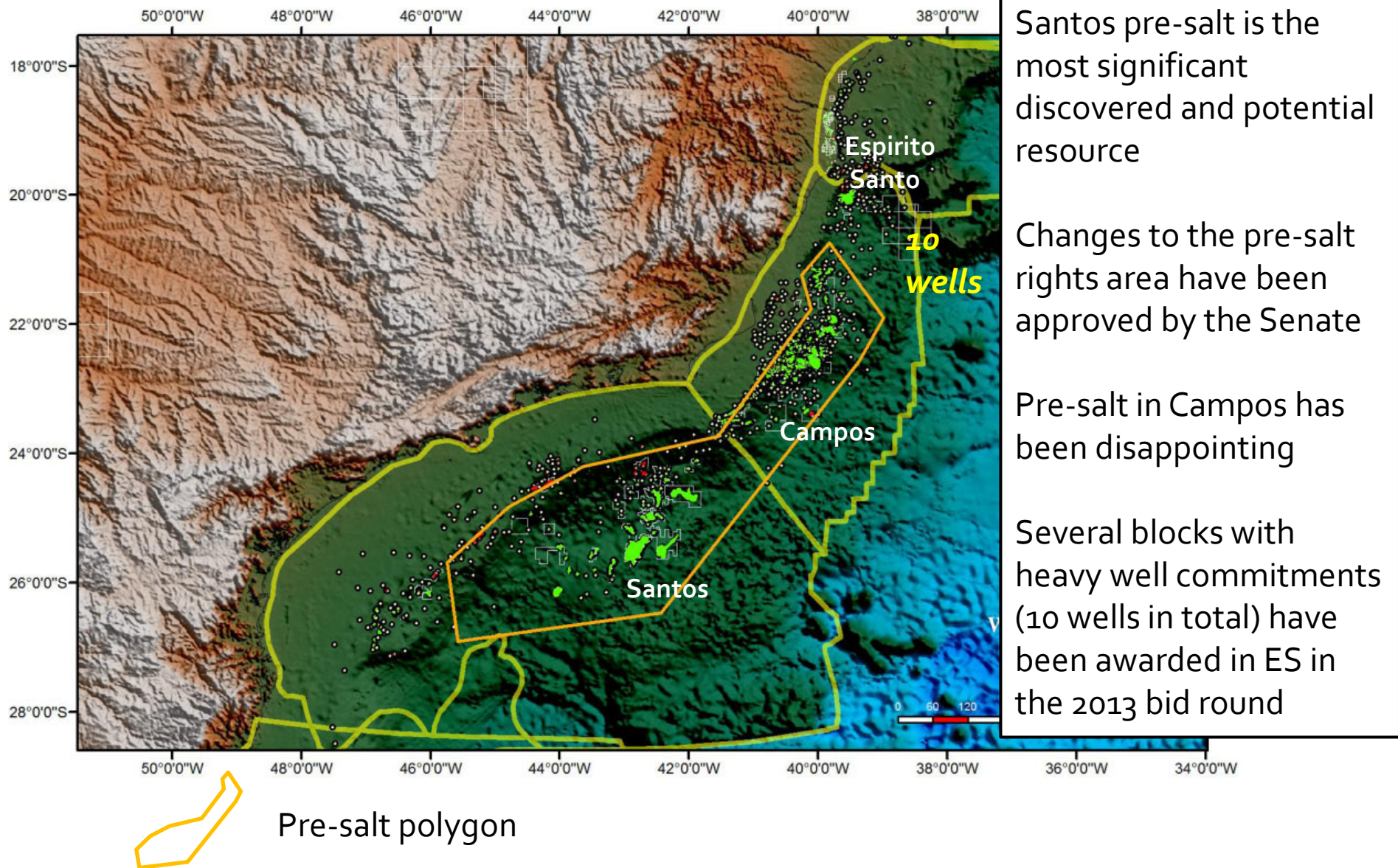
Farfan discovery, Sergipe



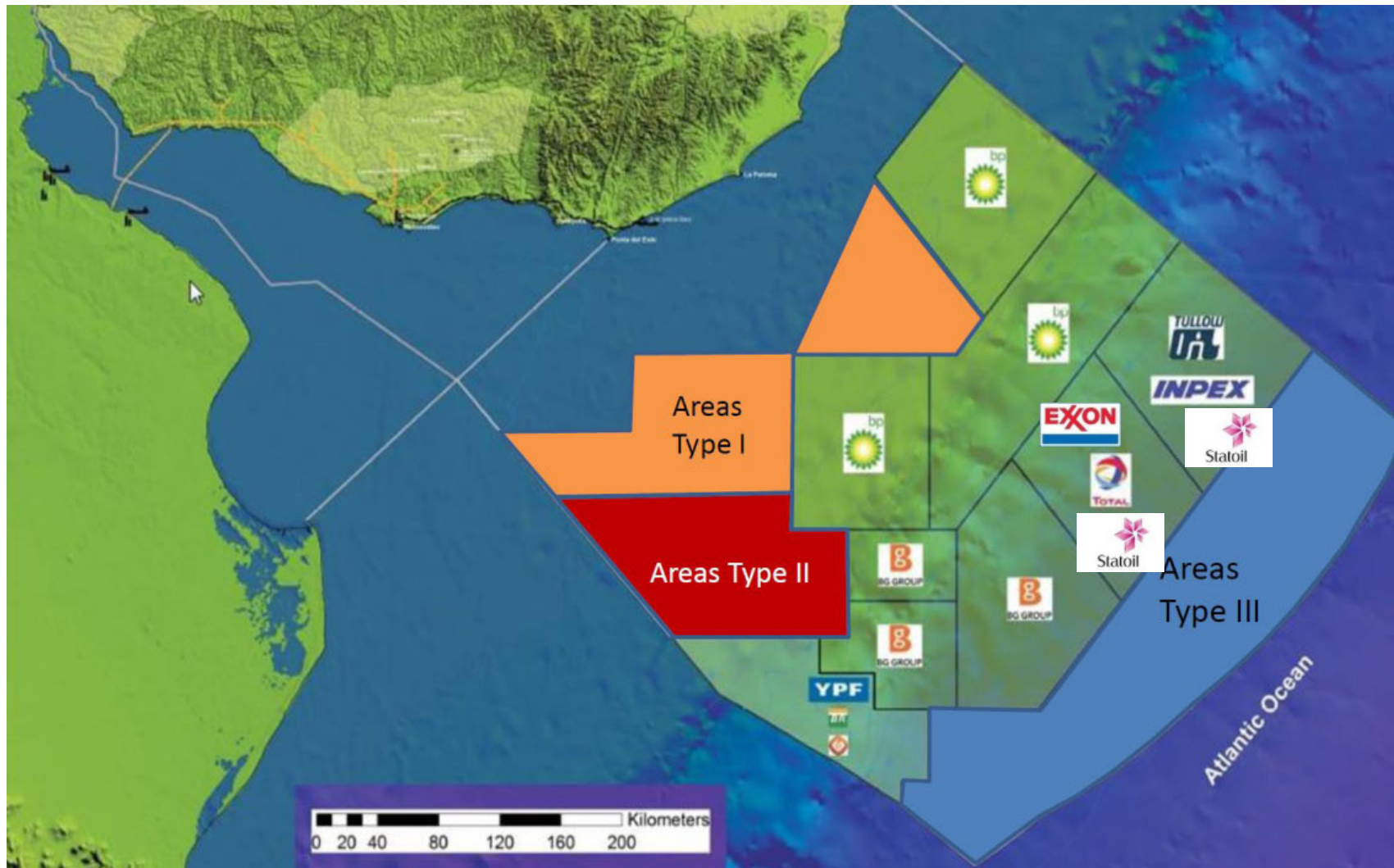
- Farfan discovery is a class II AVO anomaly easily identifiable from the background on the far stack



Espirito Santo-Campos- Santos basins, Brazil



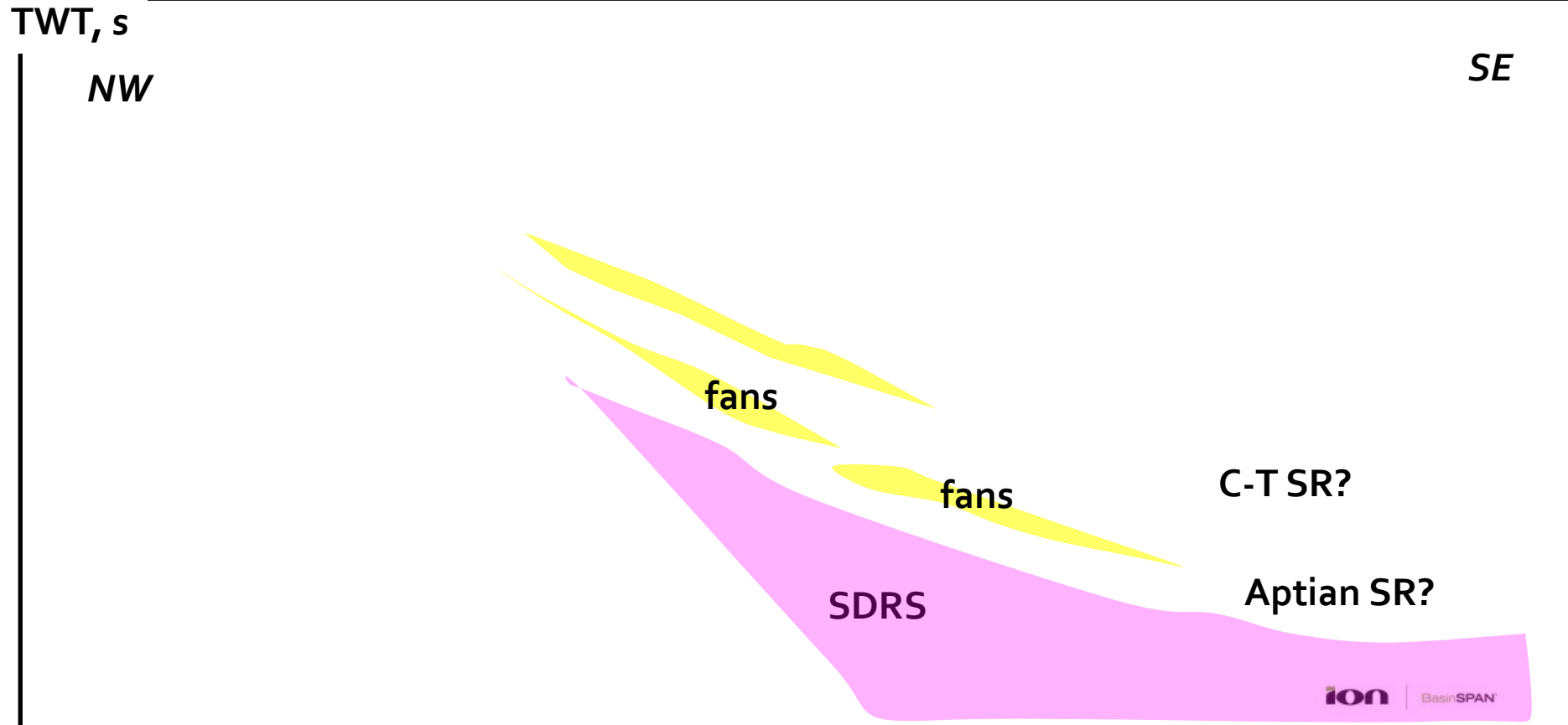
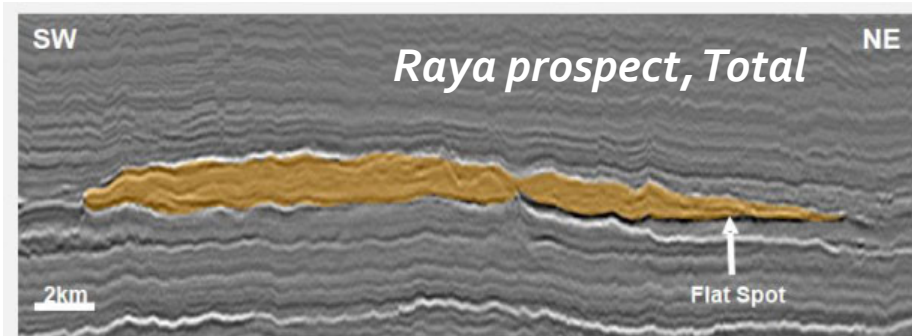
Uruguay Offshore – the Big Test



- Licences awarded in 2012. Large MC 3D sets acquired. BP exited in 2015.
- Total has 1 well committment – Exxon and Statoil farmed in.

Geoseismic line, Pelotas basin, offshore Uruguay

- Volcanic margin
- Thick drift section
- Source rocks needs to be proven (Aptian/CT)? Conjugate to Namibia
- Total and partners drilling in 2016



South America - Where next?

- The potential for giant discoveries is in South Atlantic deep and ultra-deepwater – but comes with a price tag. Santos pre-salt will continue to dominate in near future.
- Key tests in 2016: Guyana appraisal and Uruguay ultra-deep water wildcat in 2016
- Equatorial margin of Brazil will be tested by drilling in the next 2-5 years
- South America has a variety of basins and plays – there is something for everyone and the investments and discoveries will continue

Acknowledgements

- **Premier Oil's Brazil and Falklands team – Oliver Cheshire, Nick Crabtree, Tim Rady, Matt Plummer, Iain MacEwen, Mark Anderson, Will Mitchell, Mike Lanaway, Kate Longely**
- **Ion GXT, CGG, Spectrum, and Western Geco for the permission to show seismic data**
- **Partners Rockhopper and CEPSA for permission to show data**
- **AAPG for inviting this presentation**