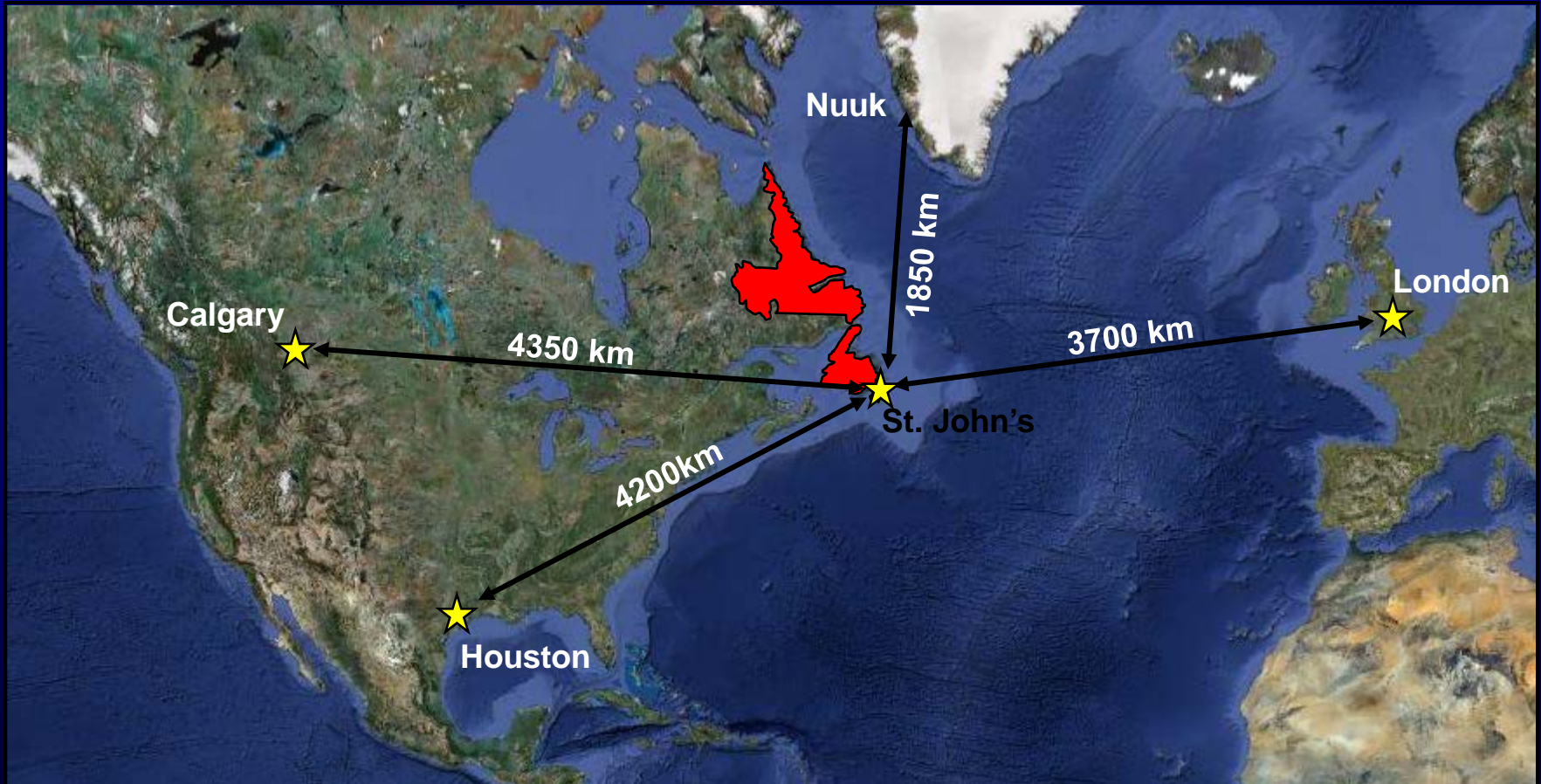




# **Newfoundland and Labrador Resource Opportunities: 2013 Licensing Round and Beyond**

**David Middleton  
Director of Petroleum Geoscience  
Department of Natural Resources  
Government of Newfoundland and Labrador, Canada**

# Location



# Location



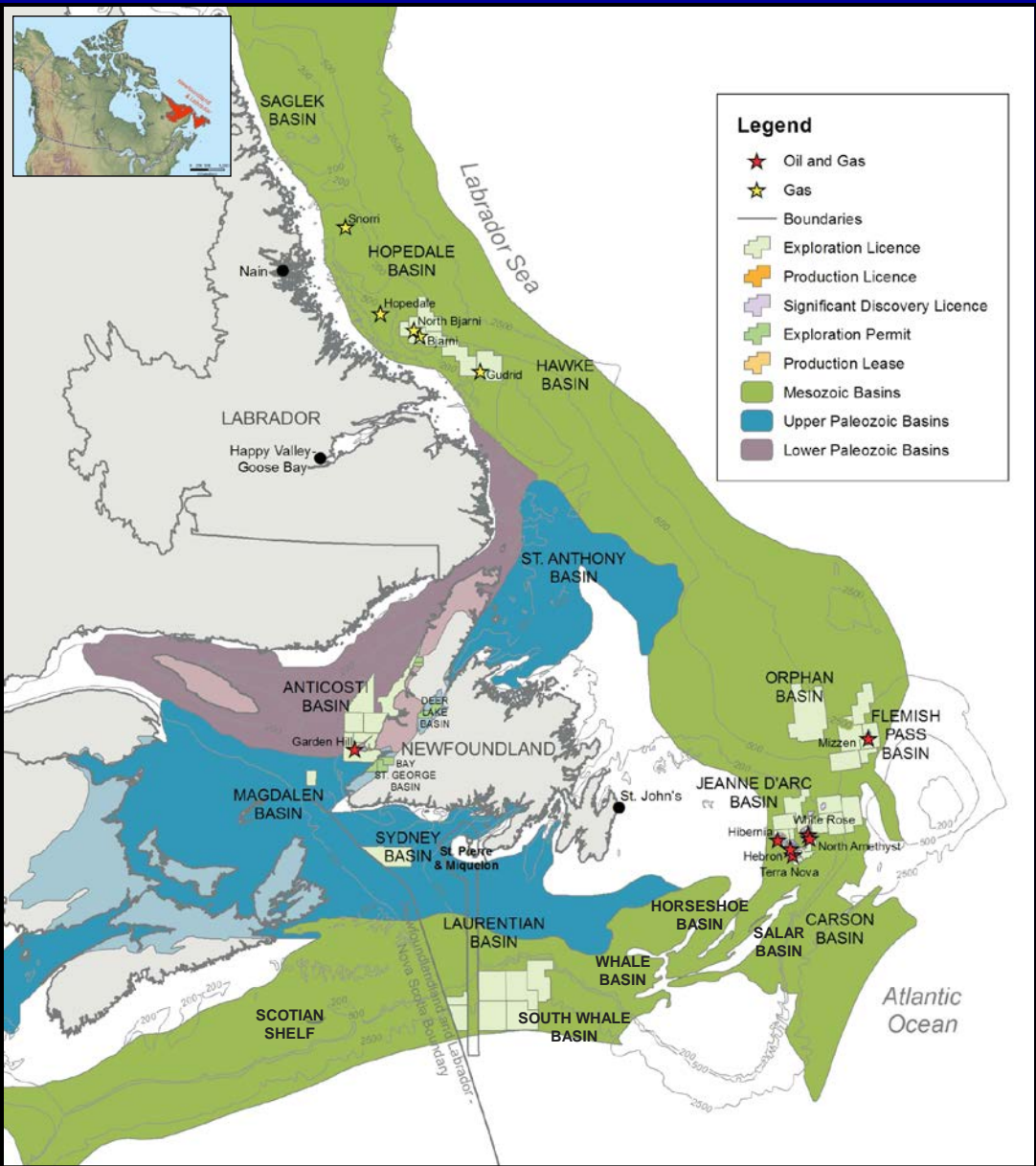
# Overview



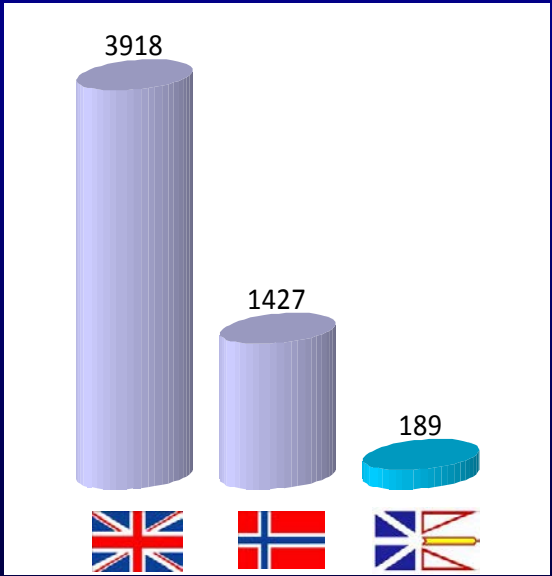
- Total Land Area in excess of 800,000km<sup>2</sup> (200 Million acres). Average Block size 100x the size of US Gulf of Mexico Blocks.
- Numerous sedimentary basins, very underexplored.
- >3 Billion barrels oil, >11 Tcf gas & >500MM barrels NGLs discovered so far. Undiscovered estimated at 6 Bbbl oil and 60 Tcf. 1.3 Billion barrels produced to date.
- NL accounts for >10% of Canada's total oil production and approx 1/3 of Canada's conventional light crude output.
- One producing basin so far, Jeanne d'Arc, averaging 275,000 bopd production. Significant Discovery now in Flemish Pass.

**< 10% currently held under licence**

# Underexplored Proven Petroleum Region



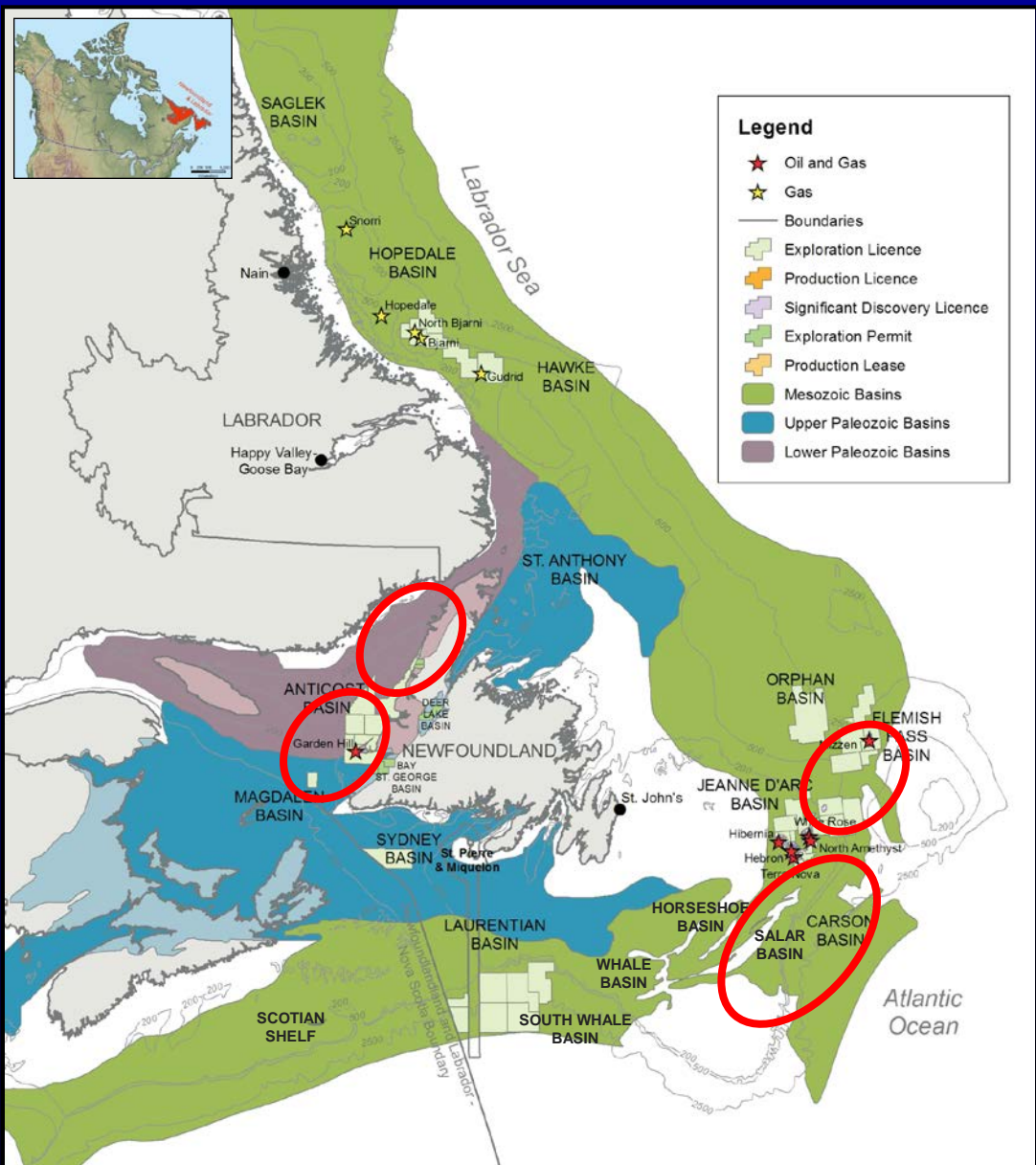
## Exploration and Appraisal Wells



1 well per 139 km<sup>2</sup>      1 well per 461 km<sup>2</sup>      1 well per 4,203 km<sup>2</sup>

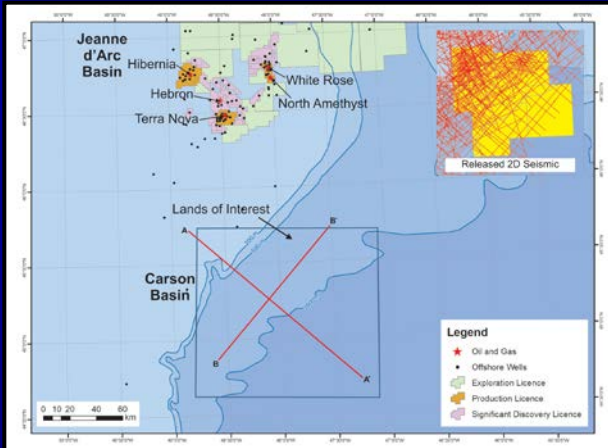
Source: WoodMackenzie 2010, CNLOPB 2009

# Lands of Interest – Call For Bids Imminent!

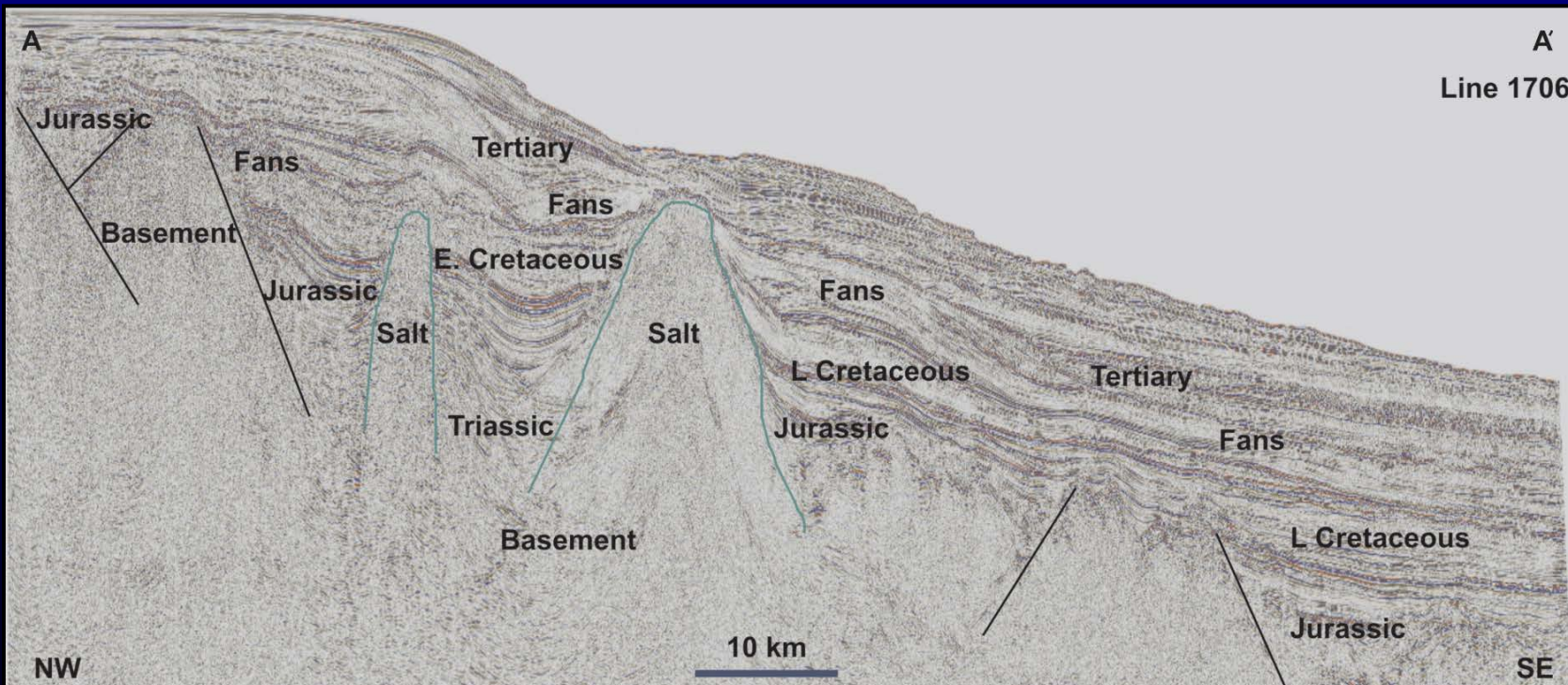


• 2013 Offshore Call for Bids expected imminently. Parcels in frontier Carson-Salar Basin, Flemish Pass Basin, Anticosti Basin and Magdalen Basin.

# Lands of Interest - Carson Basin



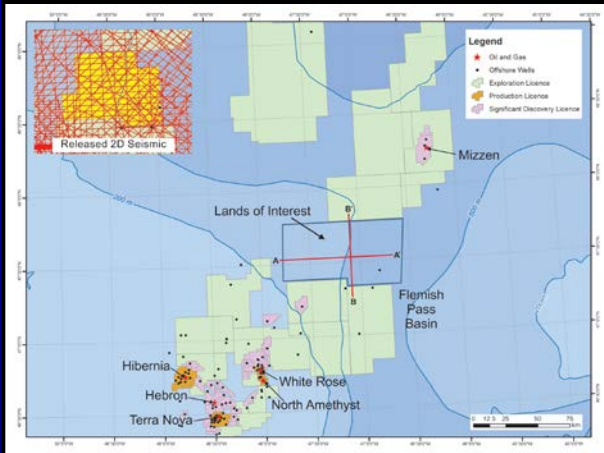
- Large area totaling 12,000 km<sup>2</sup> (2.8MM Acres), shallow to deepwater.
- Late Triassic to Quaternary with thick Jurassic and Cretaceous sections.
- 4 Exploration Wells drilled on shelf. Slope and deepwater areas completely unexplored.
- Seismic interpretation on current 2D grid indicates several large undrilled structures 50-150 km<sup>2</sup> (12350-37000 acres).



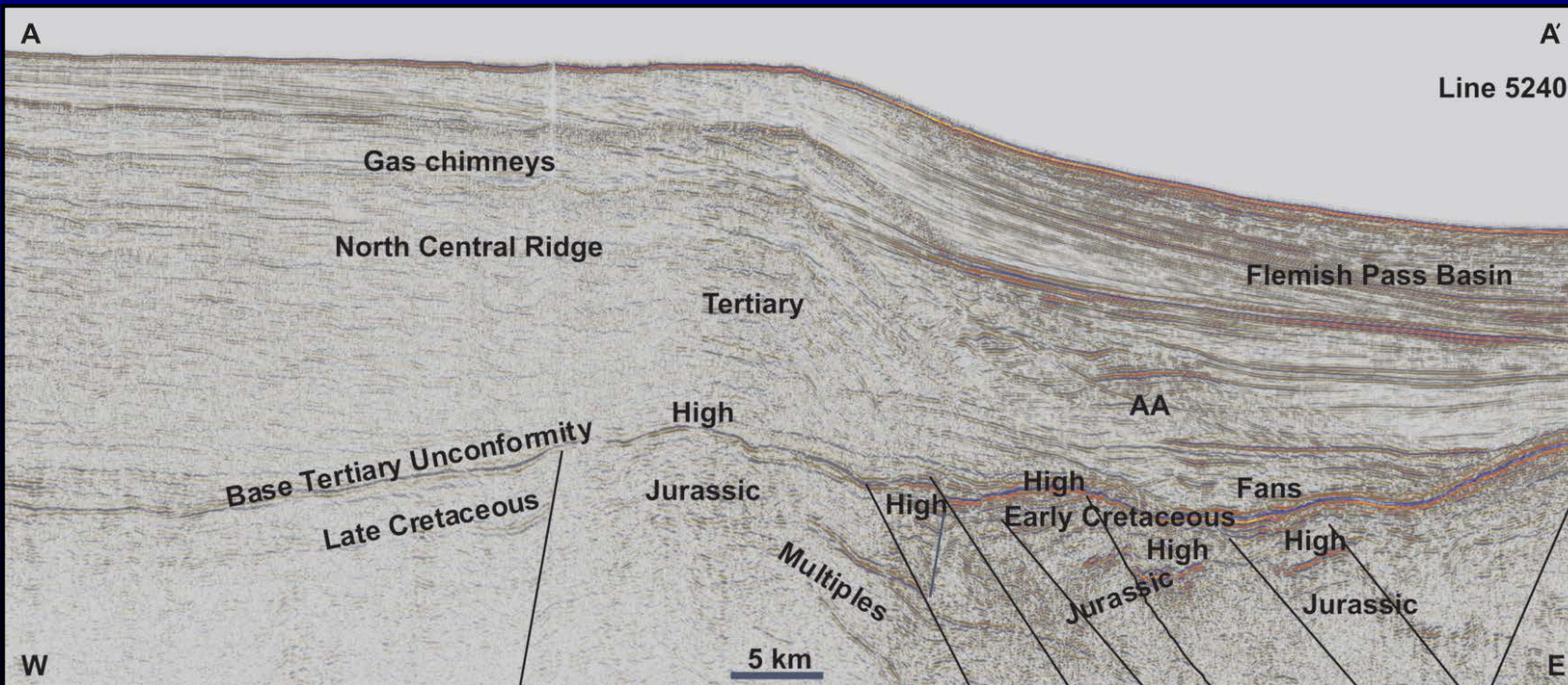
After Enachescu, 2013

Source: C-NLOPB

# Lands of Interest – Flemish Pass Basin



- Large area totaling 3,000 km<sup>2</sup> (720,000 Acres).
- Late Triassic to Quaternary with thick Jurassic and Cretaceous sections.
- 100km away from Mizzen, first Significant Oil Discovery in NL offshore outside of heartland Jeanne d'Arc Basin. Mizzen estimated at 100-200 MMbbl recoverable.
- Undiscovered resources in Flemish Pass Basin estimated by C-NLOPB at 1.7 Bbbls (50% probability).

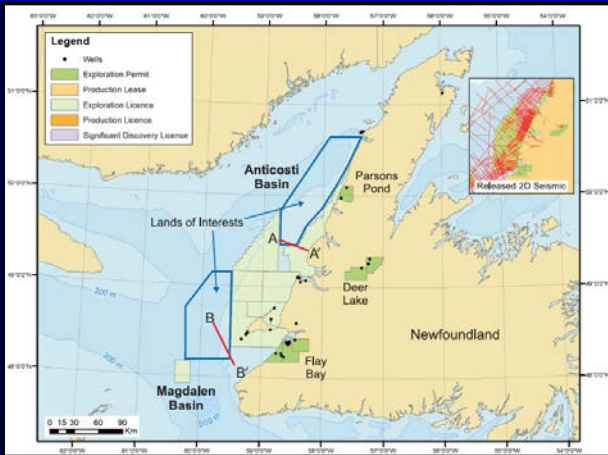


After Enachescu, 2013

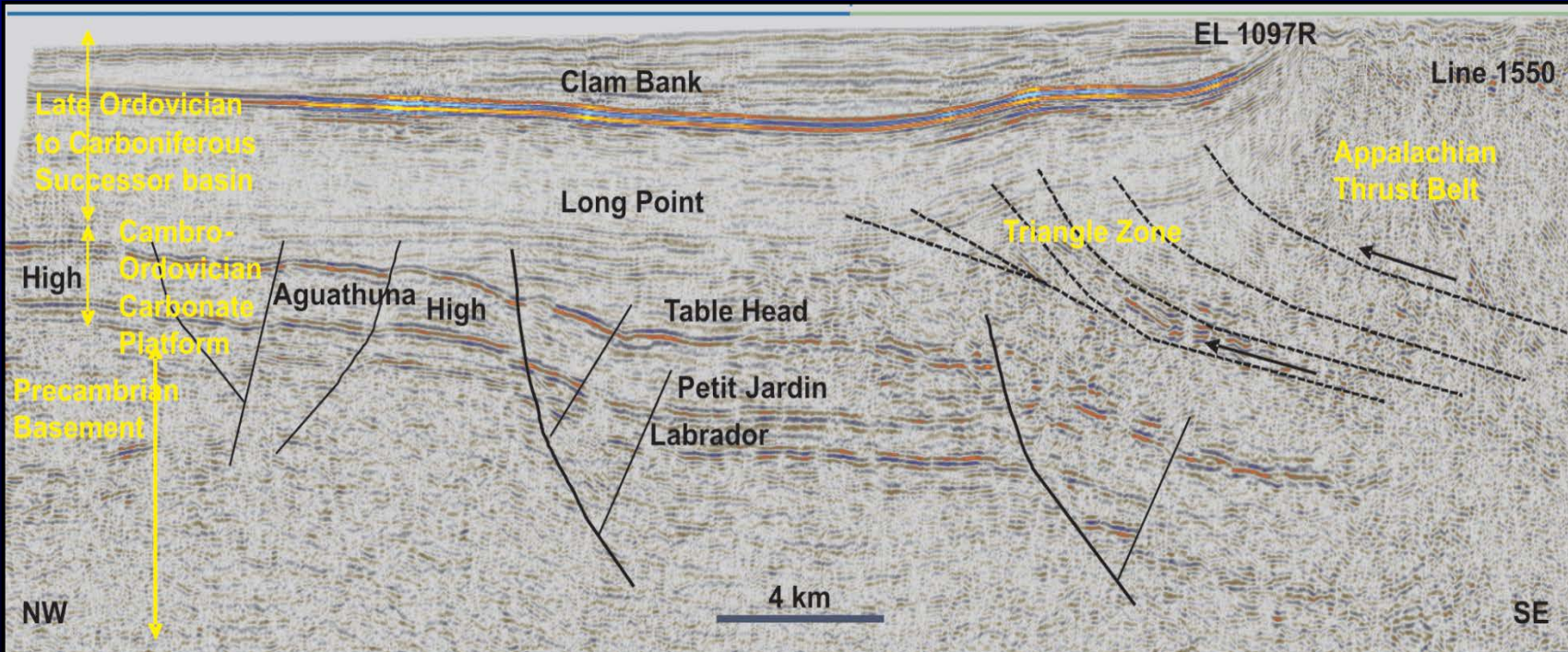
Source: C-NLOPB



# Lands of Interest – Western Newfoundland



- Large area totaling 10,638 km<sup>2</sup> (2,600,000 Acres).
- Cambro-Ordovician platform carbonates overlain by Ordovician to Devonian clastics in Anticosti Basin. Overlain again by Carboniferous to Permian clastics in Magdalen Basin.
- One Significant Oil Discovery (Garden Hill) is currently under production lease. Very little focussed exploration in offshore.
- Seismic interpretation indicates several large undrilled leads of 25-100 km<sup>2</sup> (6,200-25,000 Acres) are present.

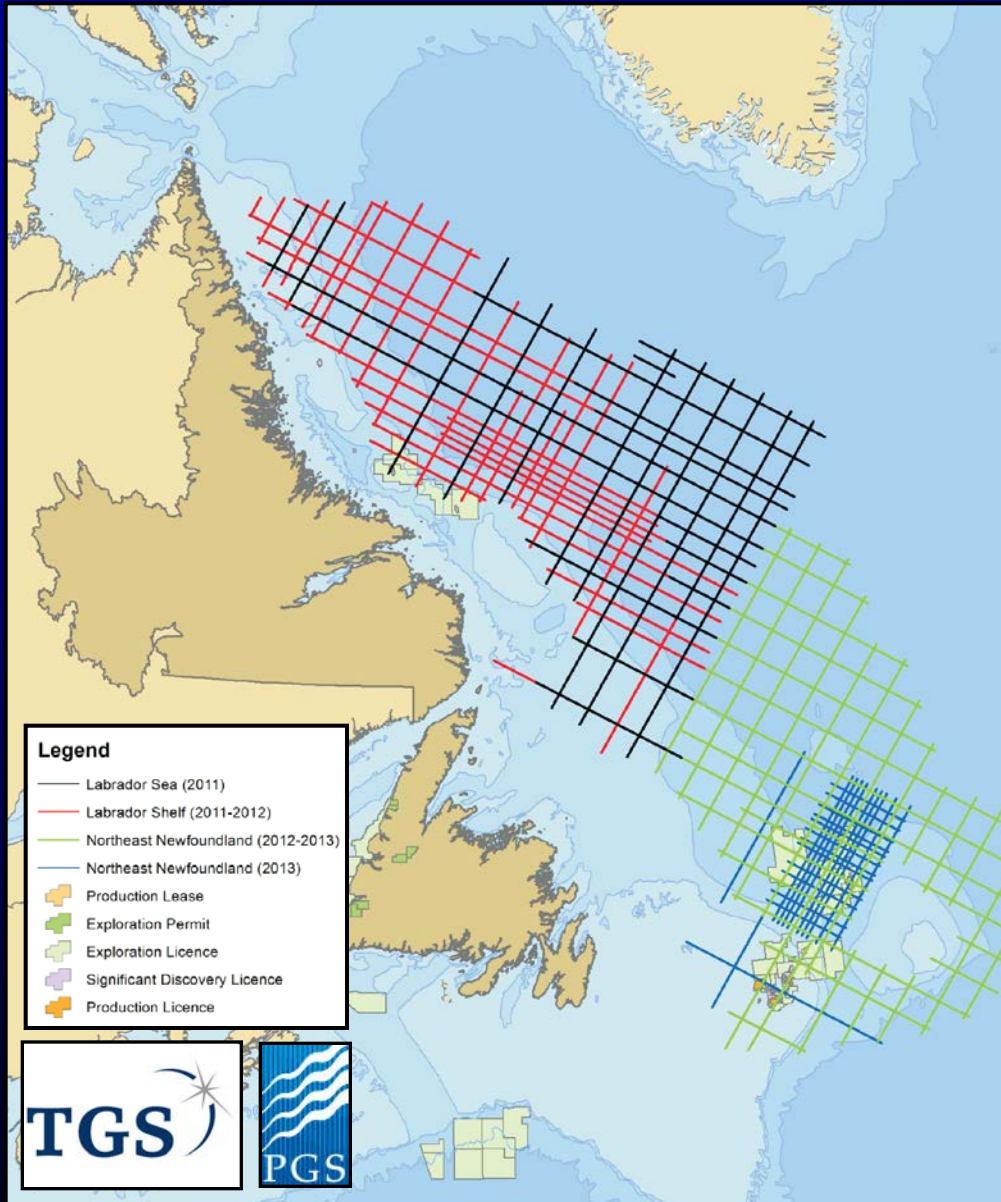


After Enachescu, 2013

Source: C-NLOPB



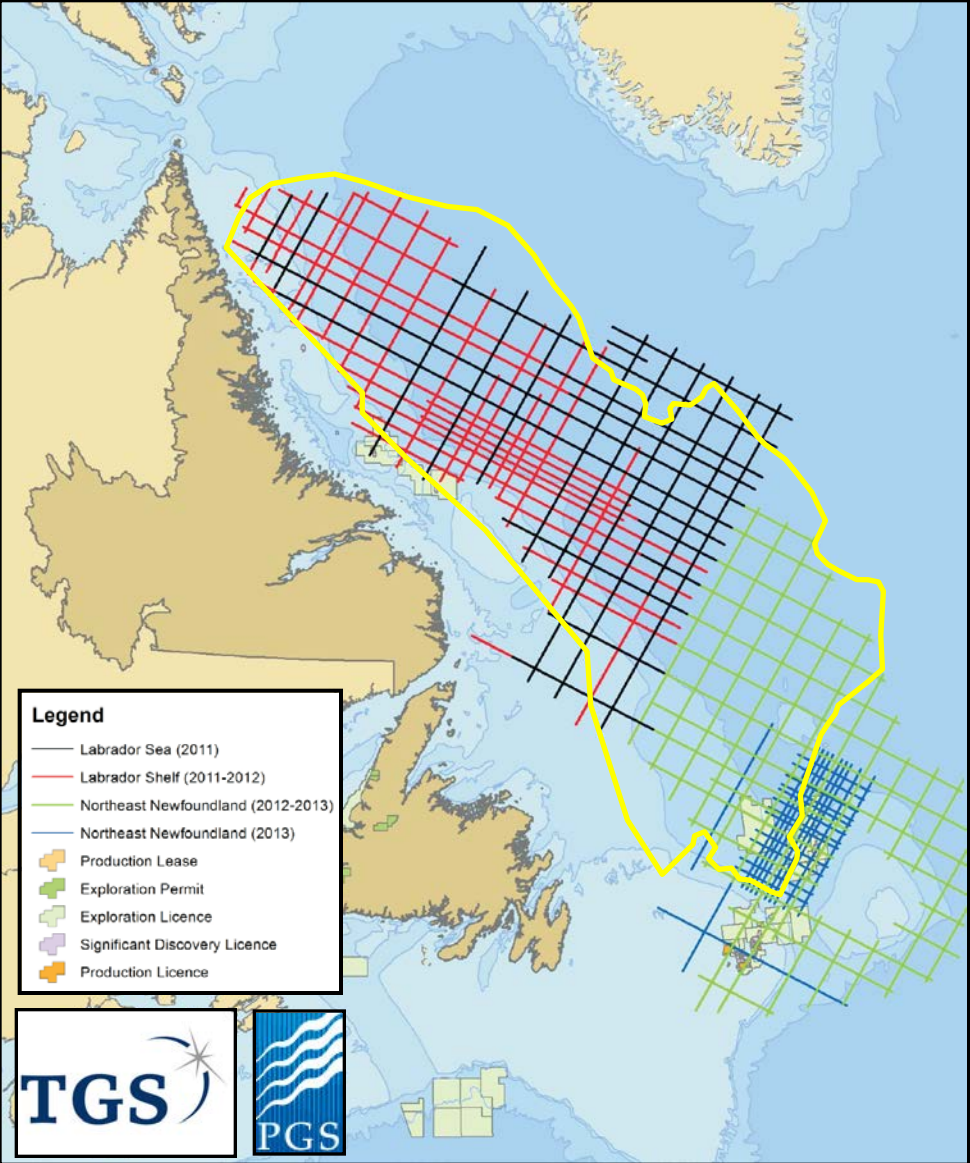
# MKI Seismic: Offshore NL 2D Program



- Partnership of Seismic Operators PGS and TGS.
- Huge seismic survey using state-of-the-art Geostreamer technology. One of the largest surveys on a global scale in recent years.
- Game-changer on visualising the Labrador shelf, slope and deepwater, including identification of new, previously unknown basins.

Seismic Grid courtesy of TGS and PGS  
Seismic grid yet to be acquired subject to change

# MKI Seismic: GOM Size Comparison



Size comparison to US Gulf of Mexico (1:1 scale)

Seismic Grid courtesy of TGS and PGS  
Seismic grid yet to be acquired subject to change

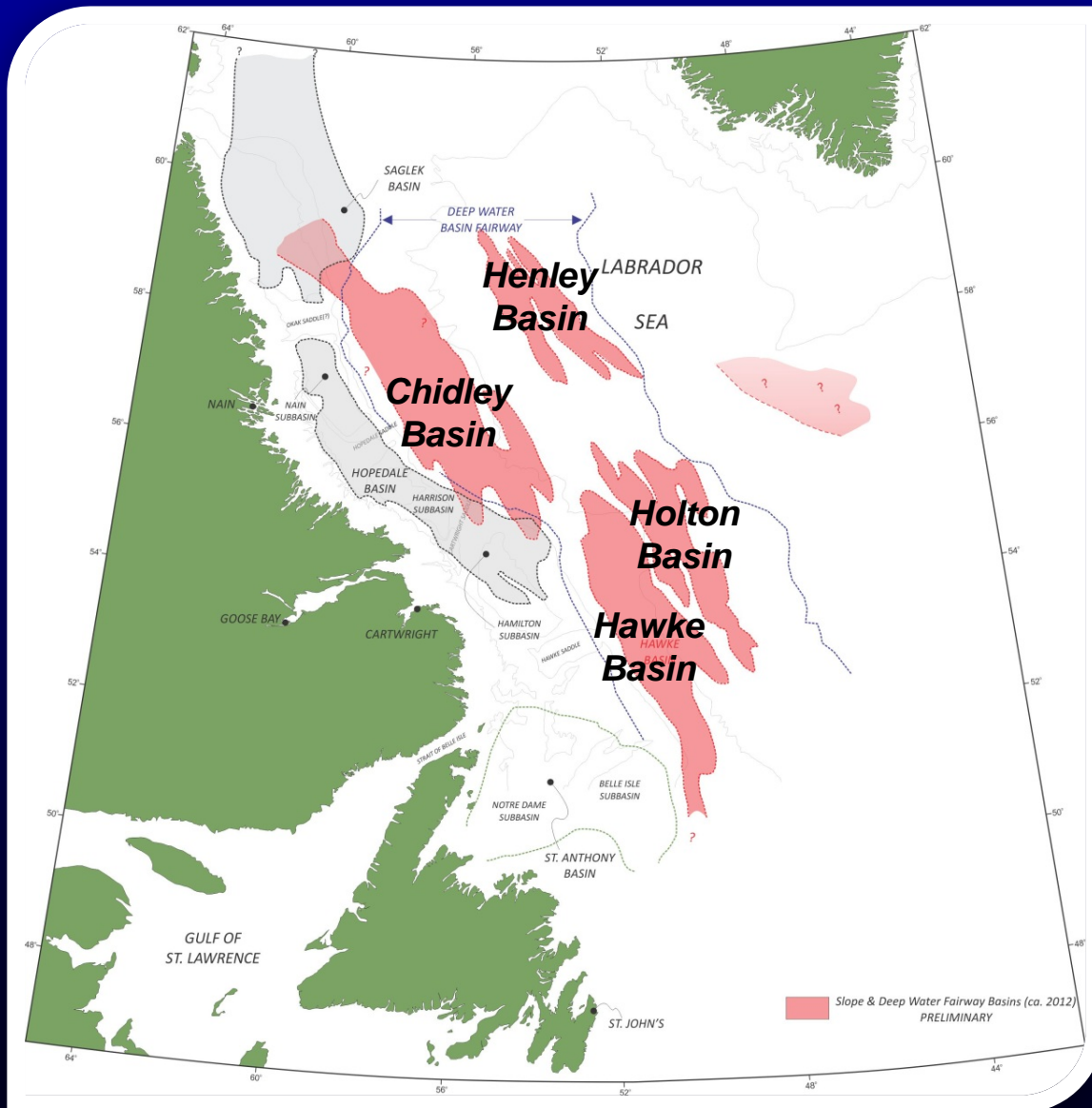


# MKI Seismic: New Labrador Basins Revealed



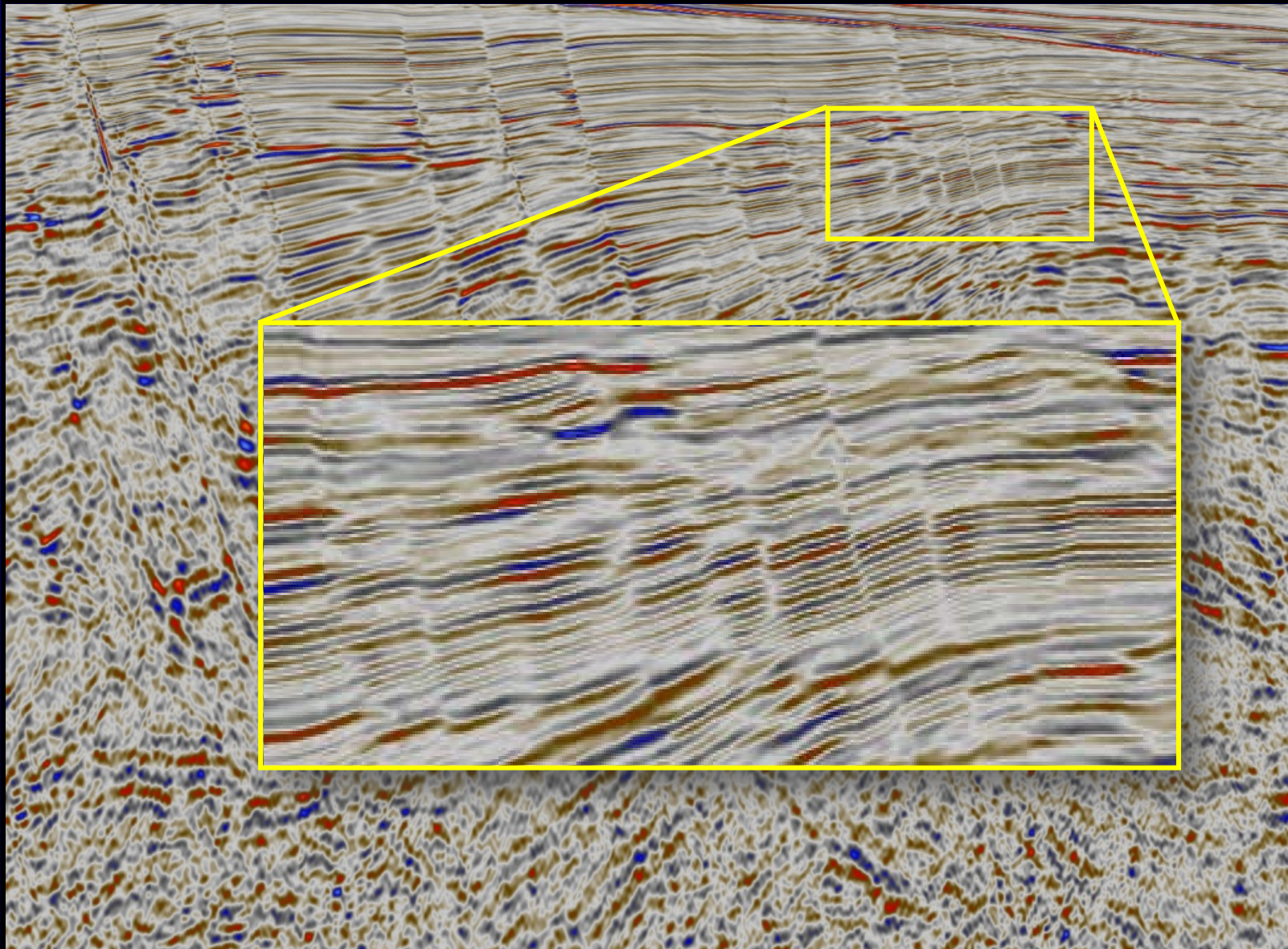
Basin Map Courtesy Nalcor Energy – Oil & Gas

# MKI Seismic: New Labrador Basins Revealed



- Previously unknown basins offshore Labrador revealed by new seismic data.
- New basins named Henley, Chidley, Holton and a large extension to Hawke Basin.
- >100% increase in offshore Labrador basin area.
- Still in preliminary stage as data processing and analysis is ongoing.
- Basins appear to extend far beyond previously presumed COB at shelf edge.

# MKI Seismic: Labrador Data Quality



Seismic data courtesy of TGS and PGS

# MKI Seismic: Preliminary Sequence Stratigraphy

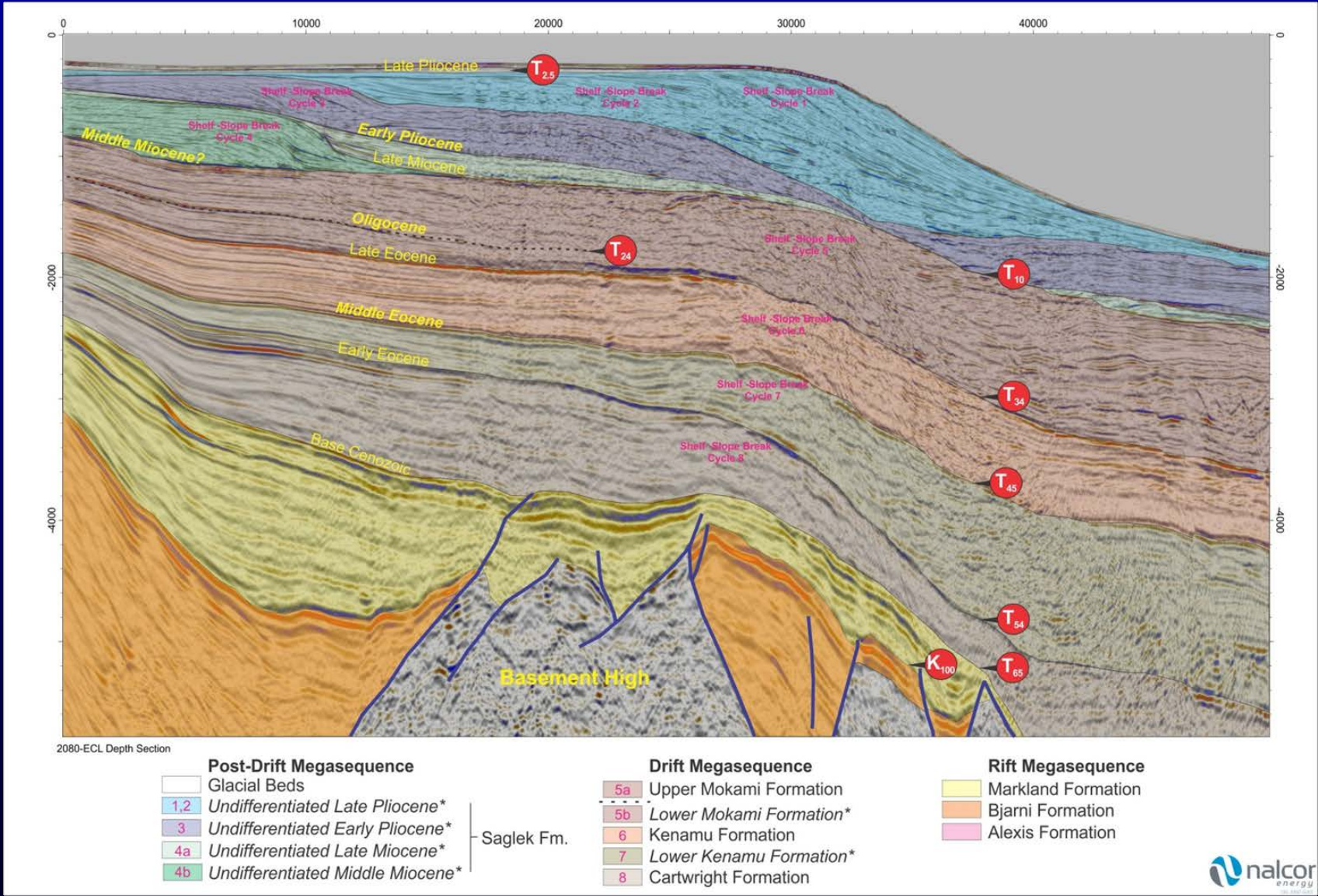


Image Courtesy Nalcor Energy – Oil & Gas

# MKI Seismic: Preliminary Sequence Stratigraphy

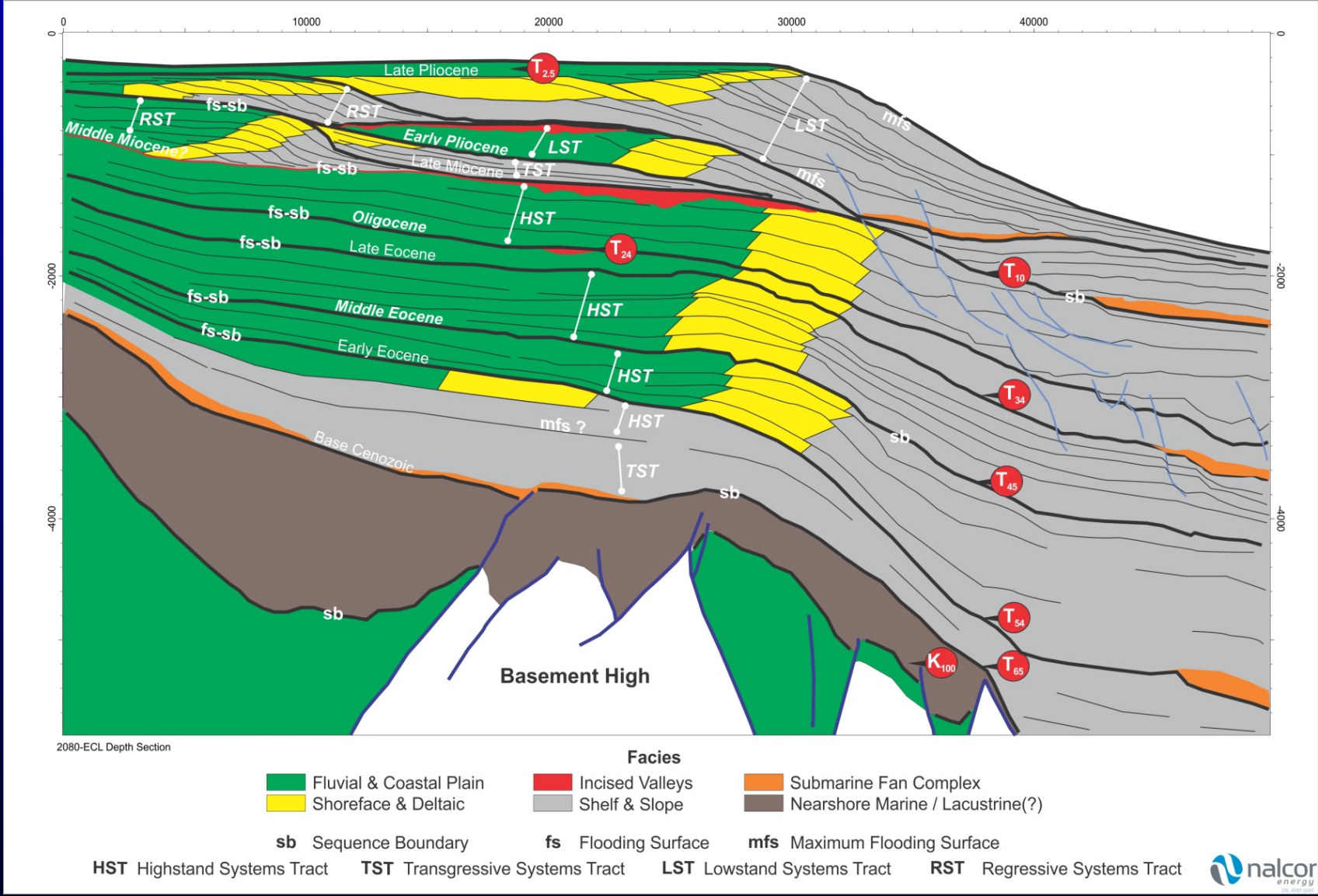


Image Courtesy Nalcor Energy – Oil & Gas





# Summary

- >3 Billion bbls Oil and >11 Tcf Gas discovered to date. 1.3 Billion bbls light crude Oil produced since first oil in 1997.
- Greatly increasing exploration activity in 2013 and beyond.
- Vast area, hugely underexplored with significant undiscovered resources. Numerous prospective basins with proven petroleum systems, including new basins revealed by modern seismic.
- New seismic data shows enormous hydrocarbon potential for offshore Labrador, with strong possibility for oil plays. Work in preliminary stages, but early results look very promising.
- 2013 Call for Bids imminent. Lands of Interest include Carson, Flemish Pass, Anticosti and Magdalen Basins.
- Favorable fiscal regime, geopolitically stable. Proximity to North American and European markets.



**Come visit us for more information at Booth #1039 in the International Pavilion**





Newfoundland  
Labrador  
CANADA