

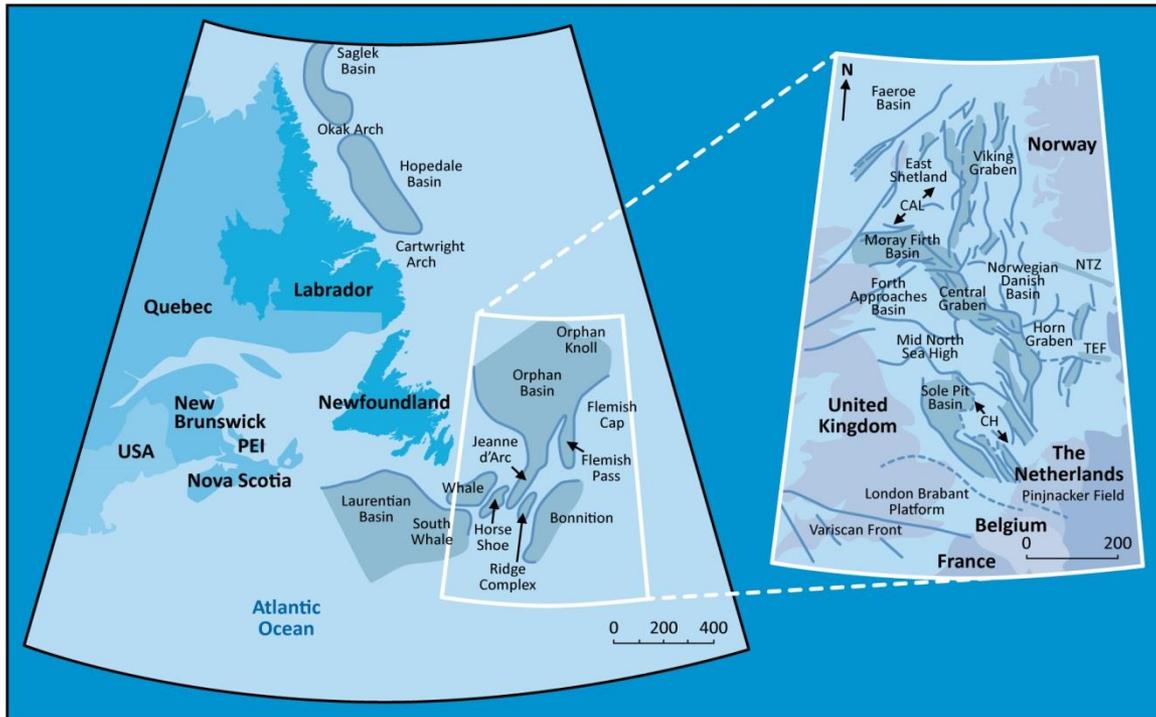
Emerging Lower Tertiary Play Trend Offshore Newfoundland

March 2016

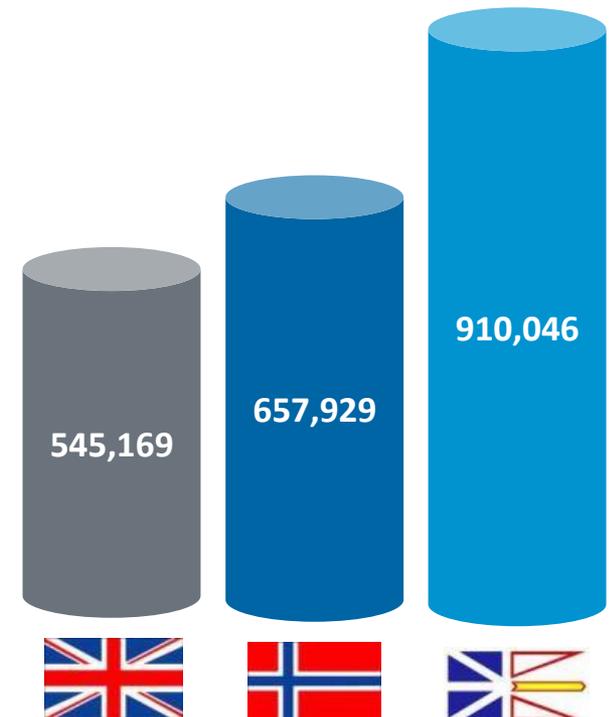


(Please note that a number of seismic lines used in the original presentation have been deleted from this slide deck due to confidentiality reasons)

NL has Numerous Large Offshore Basins



Total Offshore Sedimentary Basins Area (km²)



Data from Wood Mackenzie, 2010 and Nalcor 2012

Nalcor's Exploration Role

Upstream Exploration/Development Cycle



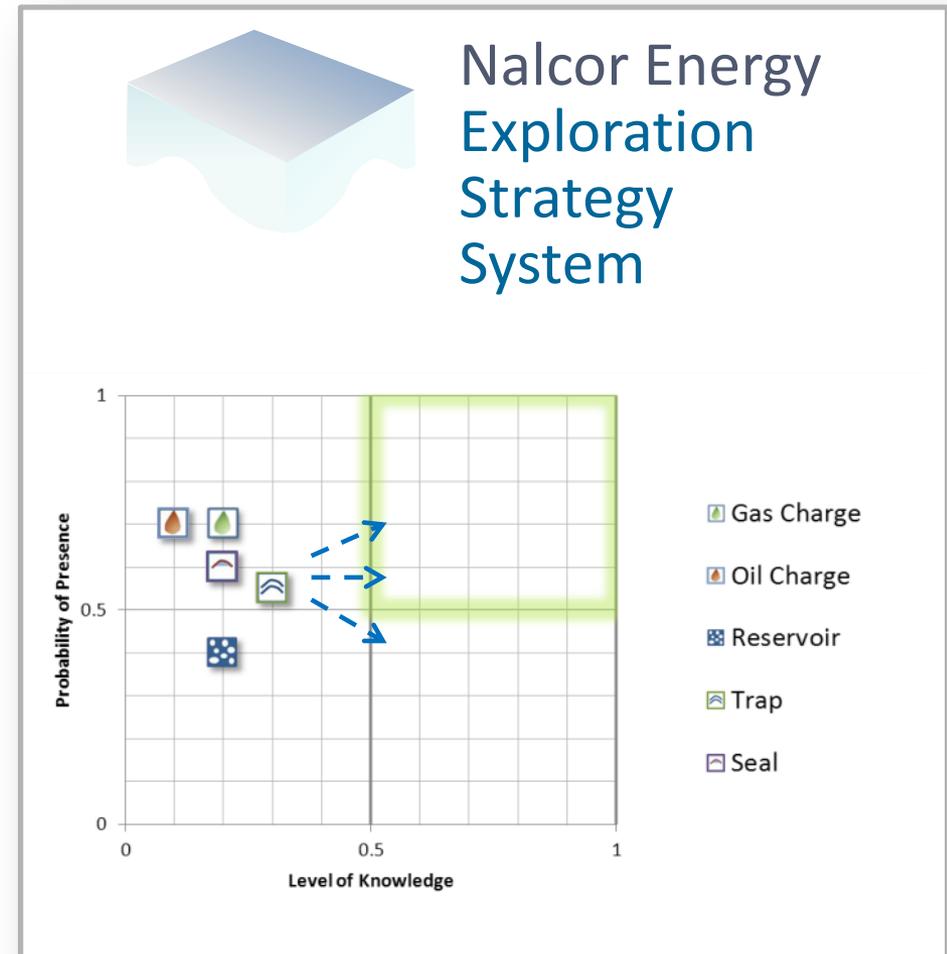
Pre-Competitive Phase



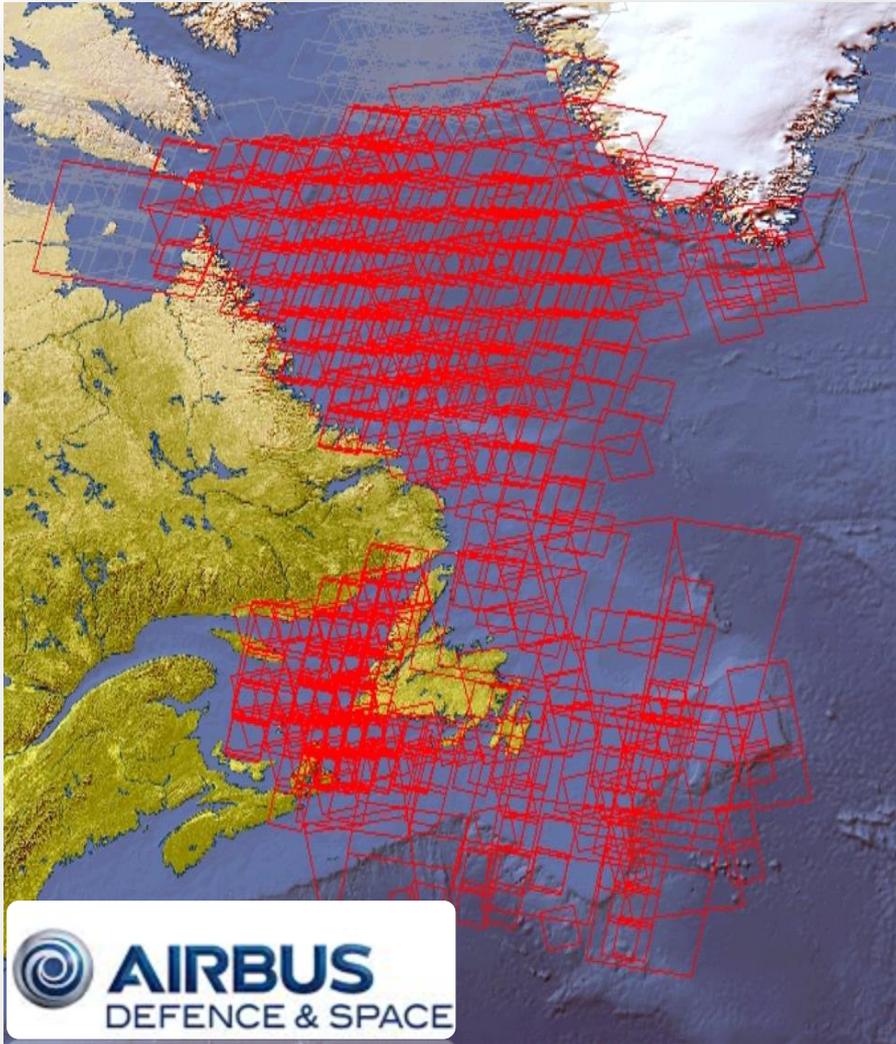
Nalcor is the State Energy Company of Newfoundland and Labrador
1500 employees, 6 lines of business

Evaluating NL's Frontier Basins

- Nalcor is systematically evaluating all NL basins to:
 - Find new oil/gas resource potential and evaluate prospectivity
 - Identify and close key knowledge gaps that hold back new activity



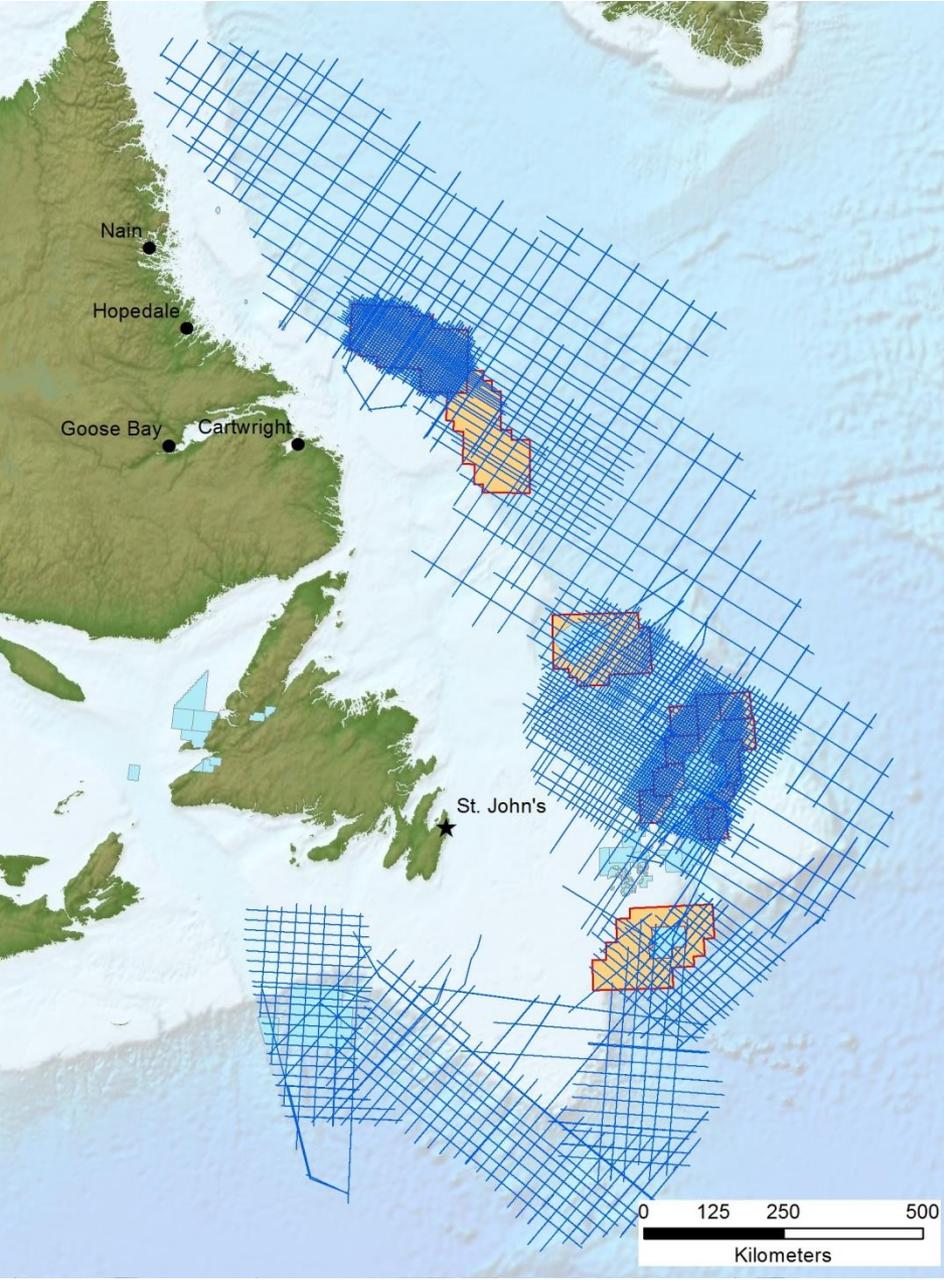
Nalcor – Airbus Satellite Seeps Project

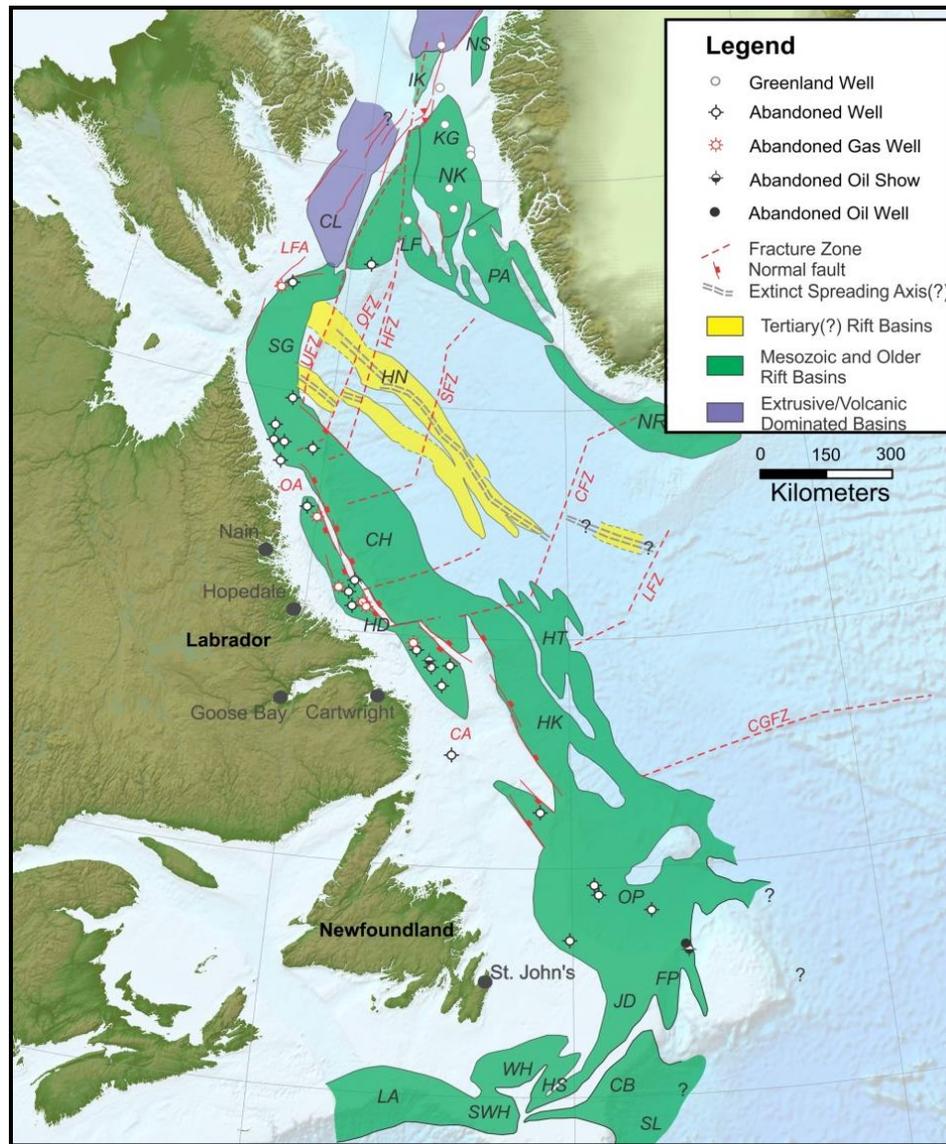


- In preparation for targeting a large scale regional 2D seismic program, Nalcor partnered with Airbus to conduct a satellite oil slick mapping project covering all of offshore Newfoundland and Labrador
- Petroleum systems in area tend to be leaky so seeps data may help find new source rocks/basins

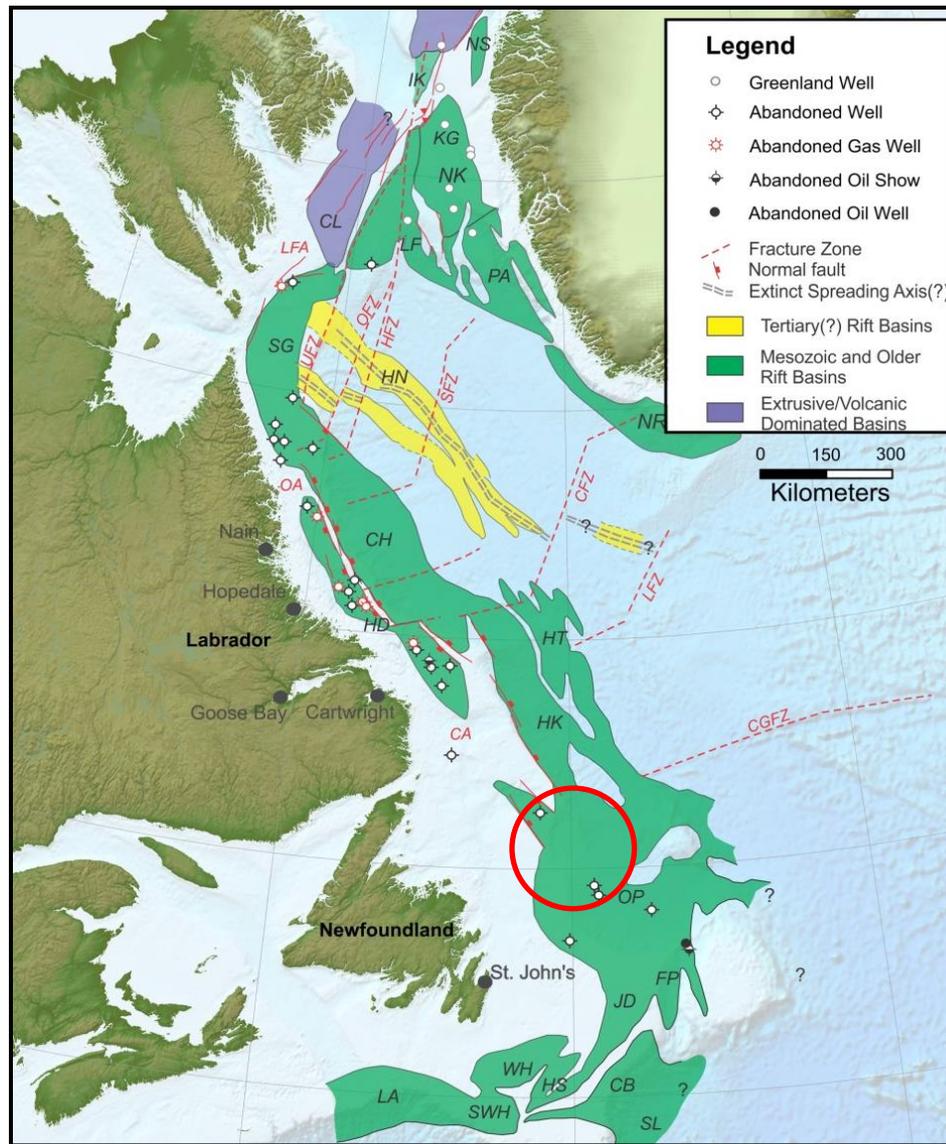
NL Seismic Investment

- Nalcor invested in a TGS/PGS regional 2D seismic program (Nalcor-OGDP seed funded)
- Long offset, Geostreamer acquisition
- Survey covers over 110,000 line kms (2011-2015)
- Detailed 5x5 km grid in Flemish Pass Area and Labrador South
- 10x10 km grids in upcoming license round areas
- Survey is one of the largest data programs globally



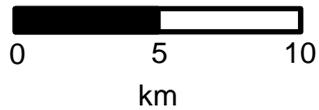
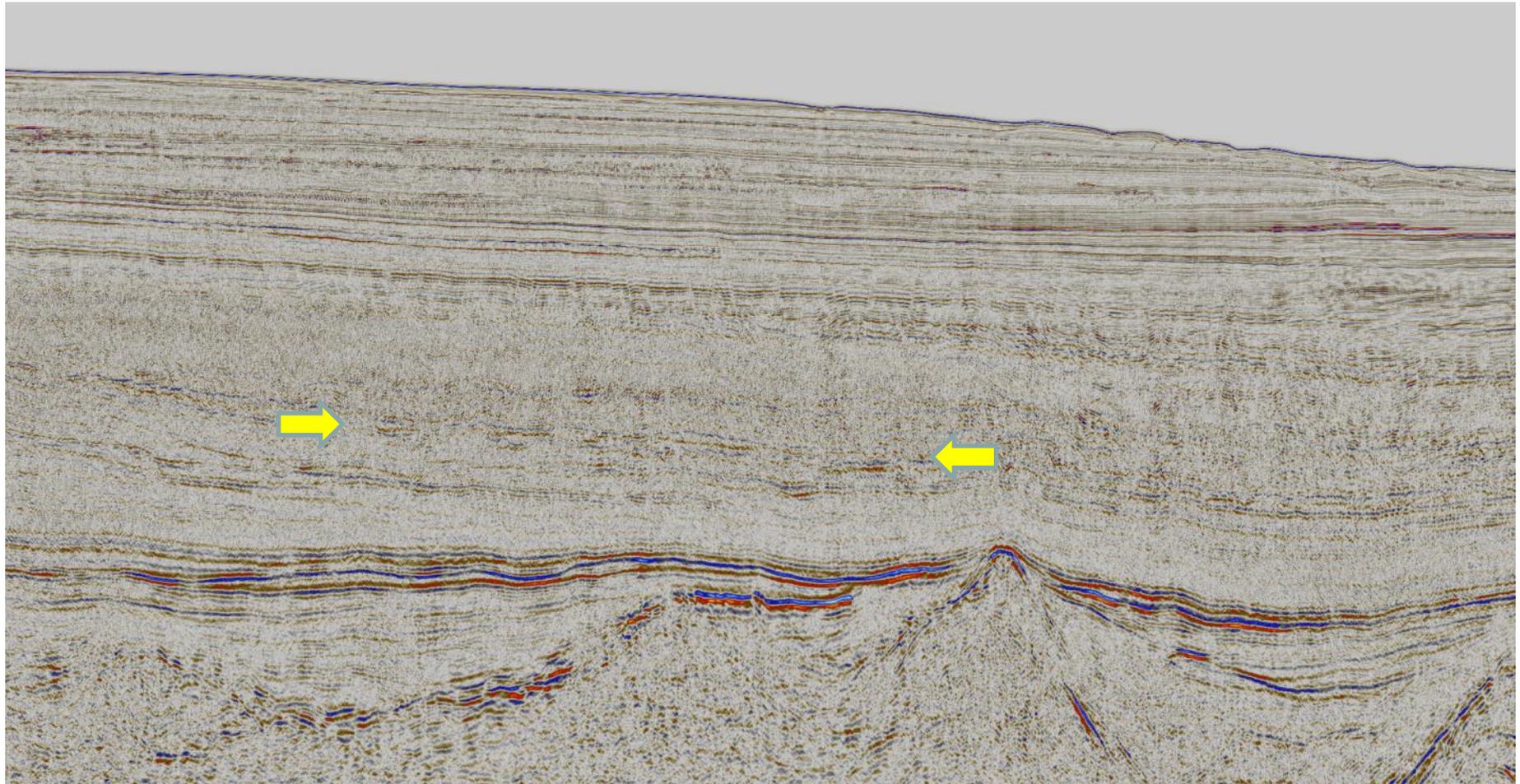


Fairway from Orphan to West Greenland (Carter et.al, 2013)



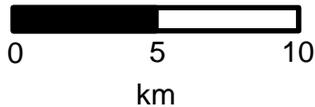
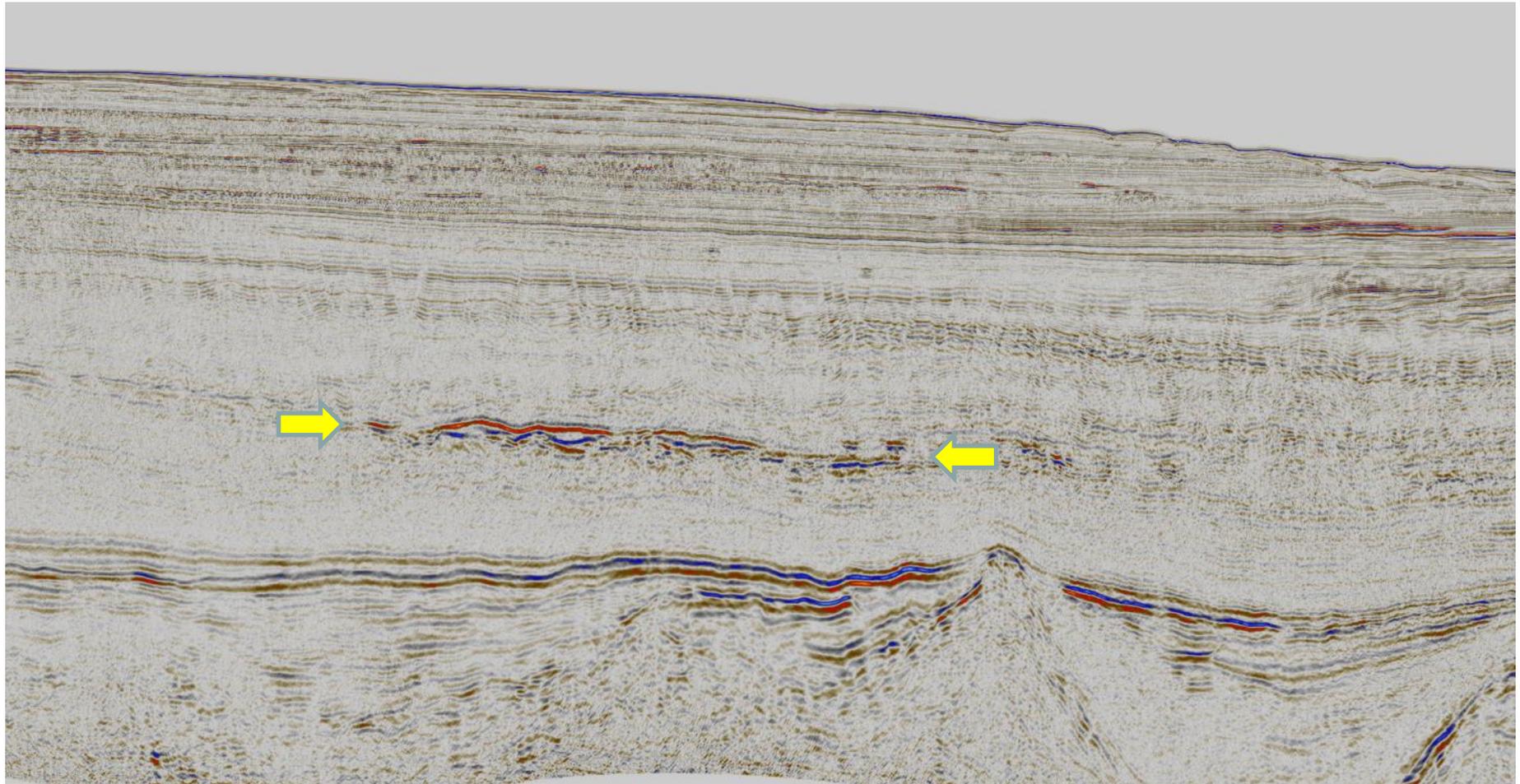
Fairway from Orphan to West Greenland (Carter et.al, 2013)

Eocene/Oligocene Turbidites



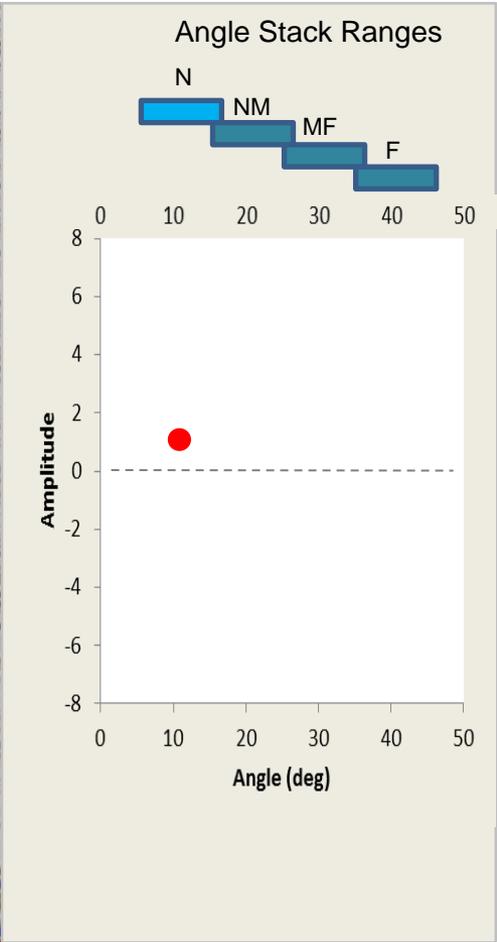
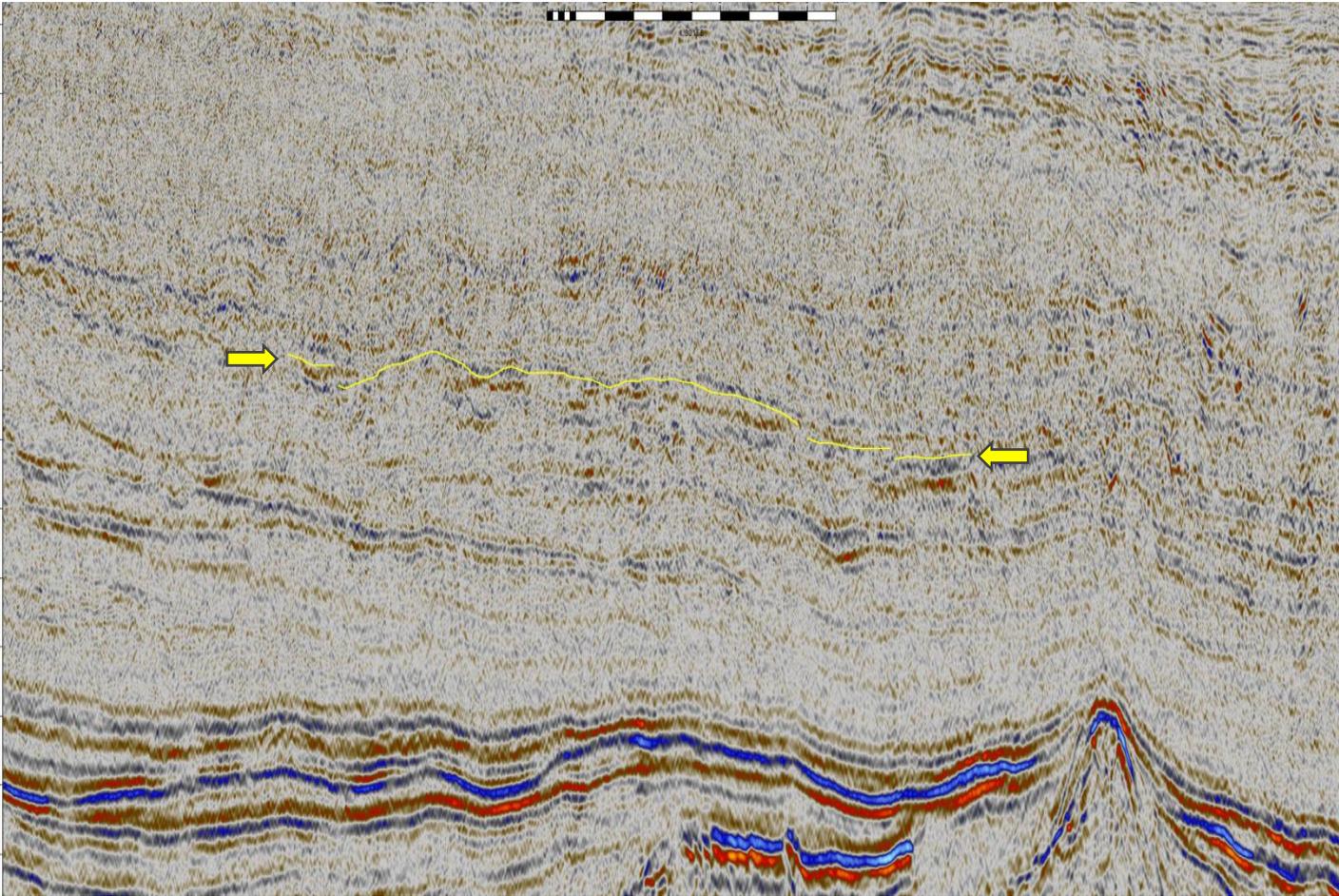
Near Angle Far Angle

Eocene/Oligocene Turbidites

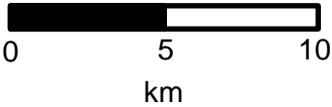
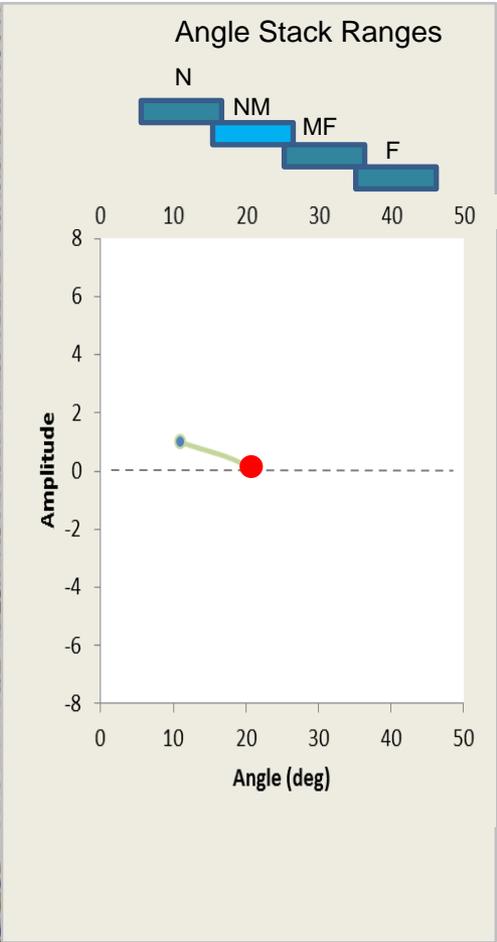
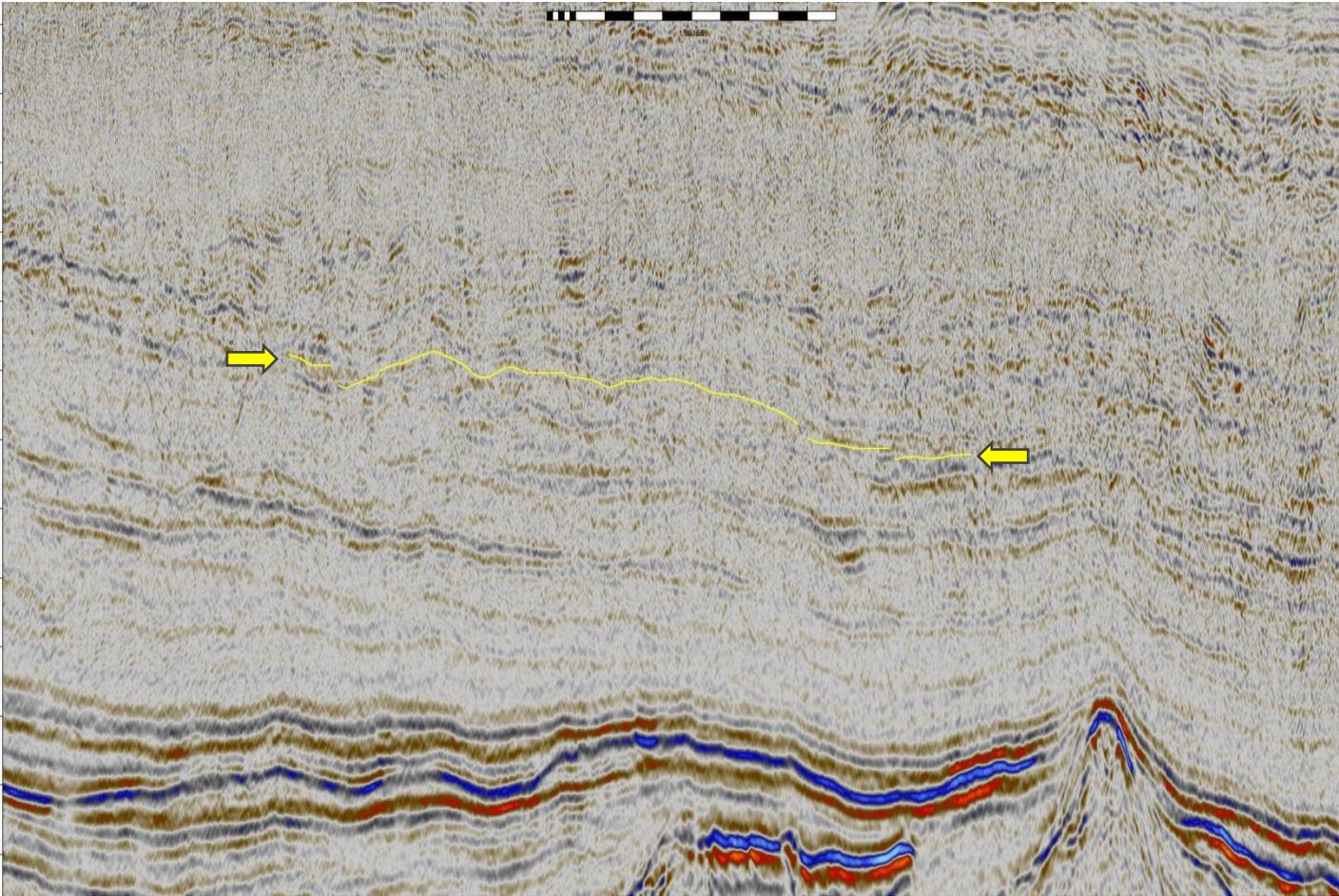


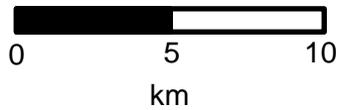
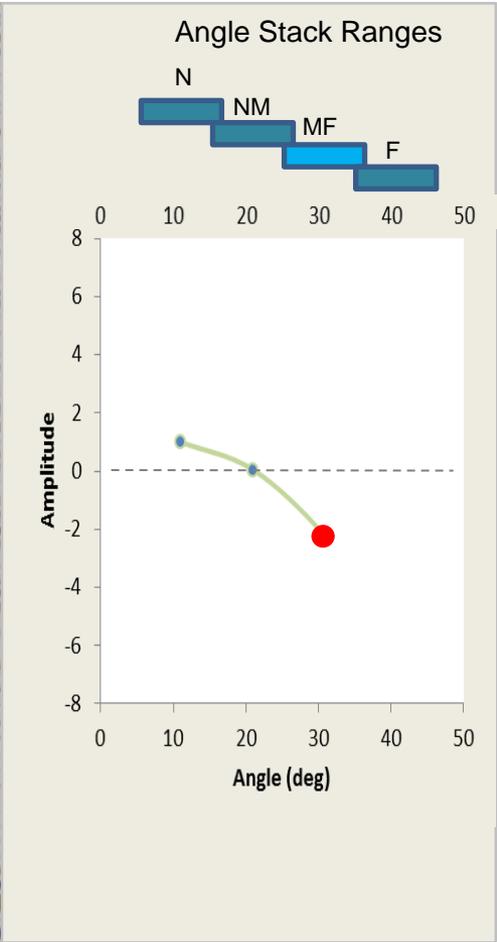
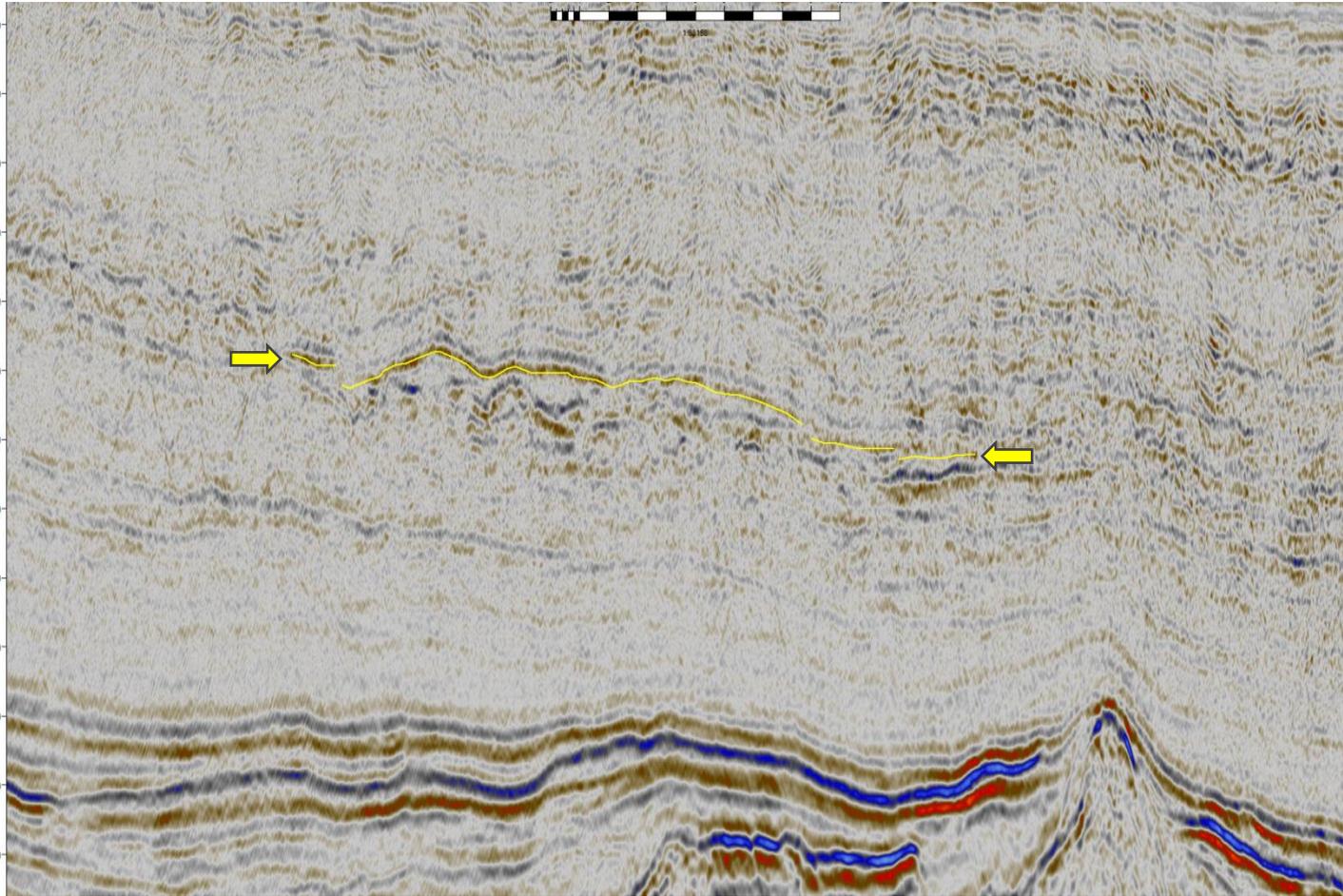
Near Angle Far Angle

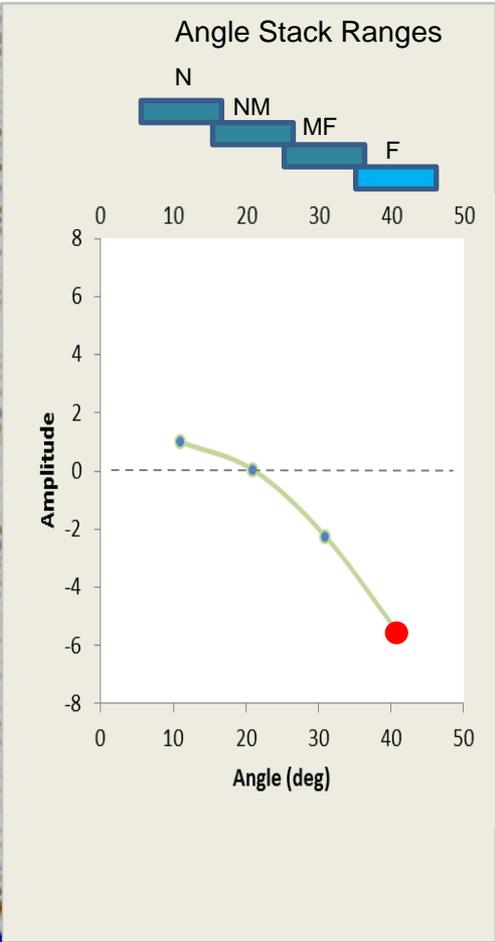
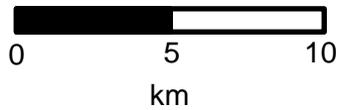
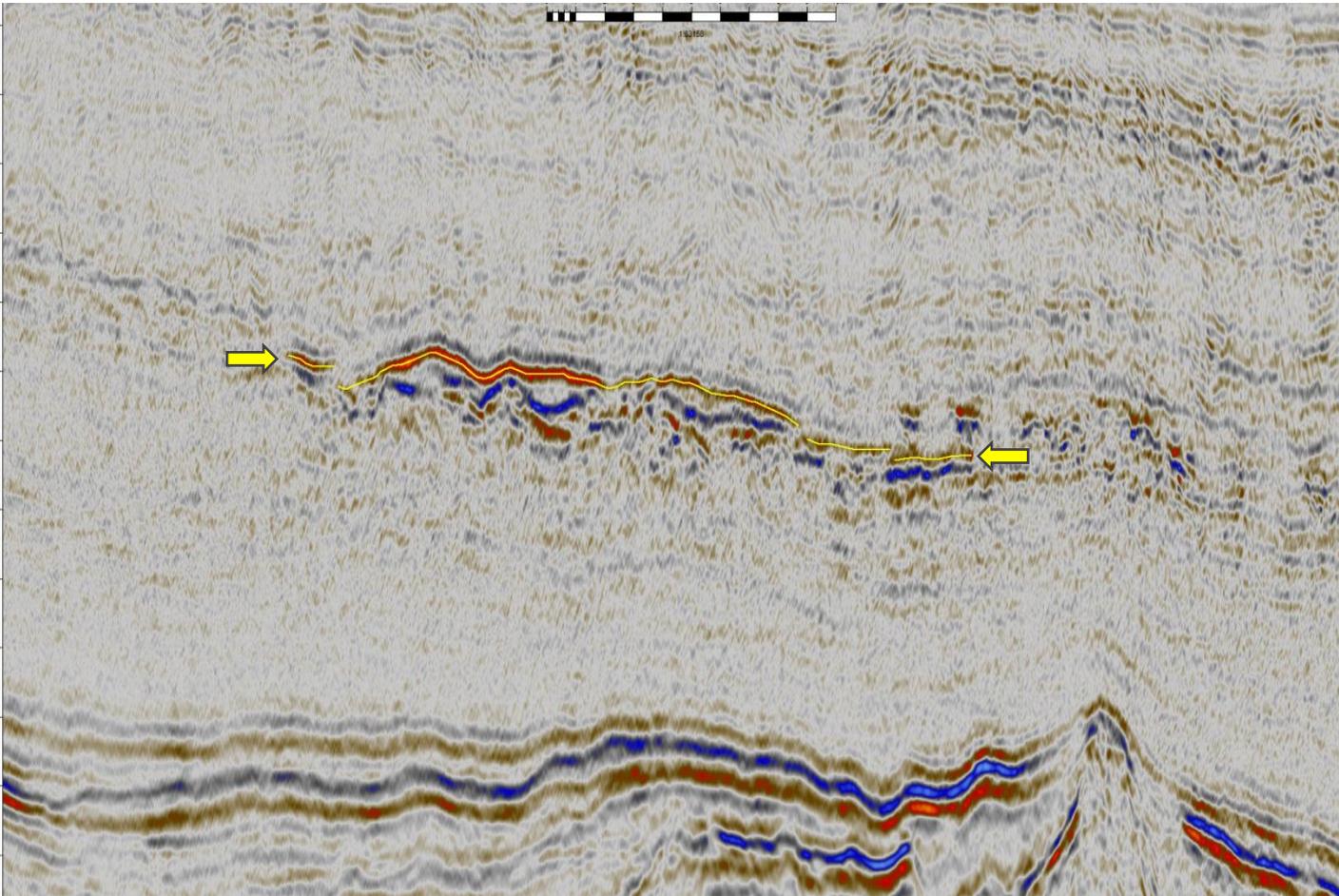
Near Near Mid Far



0 5 10 km

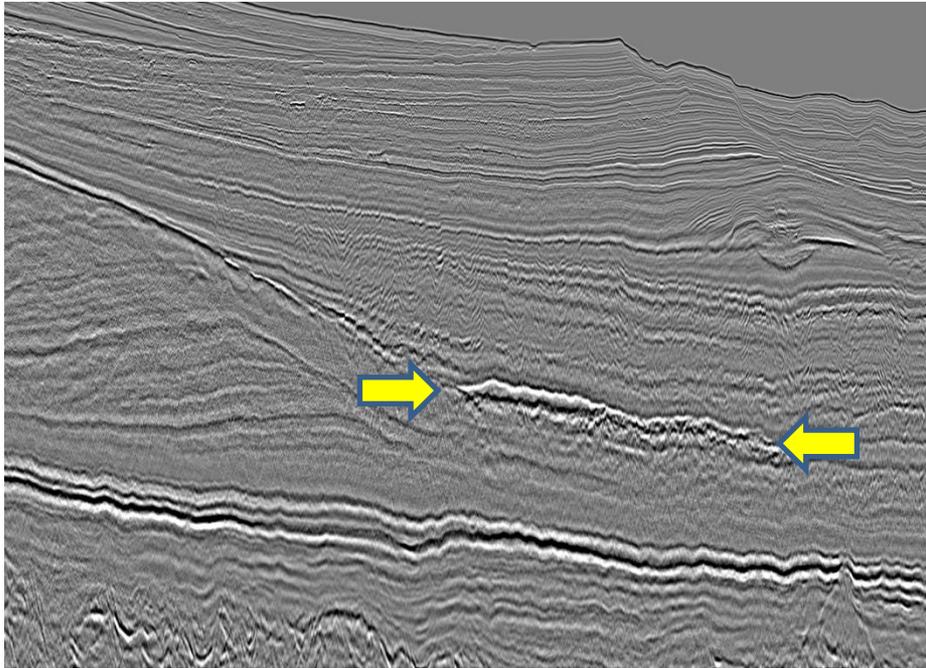




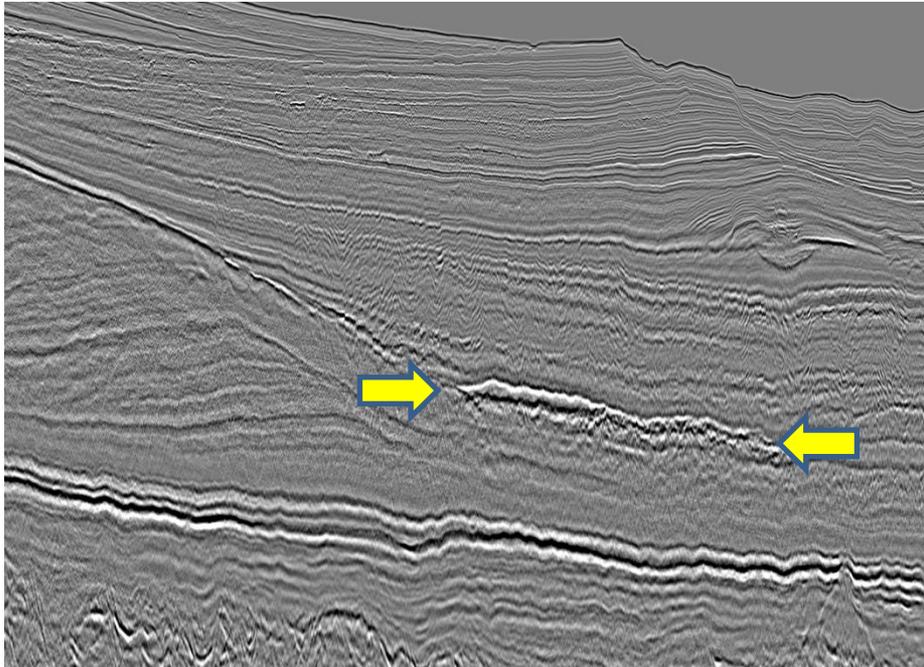


Seismic Image Redacted

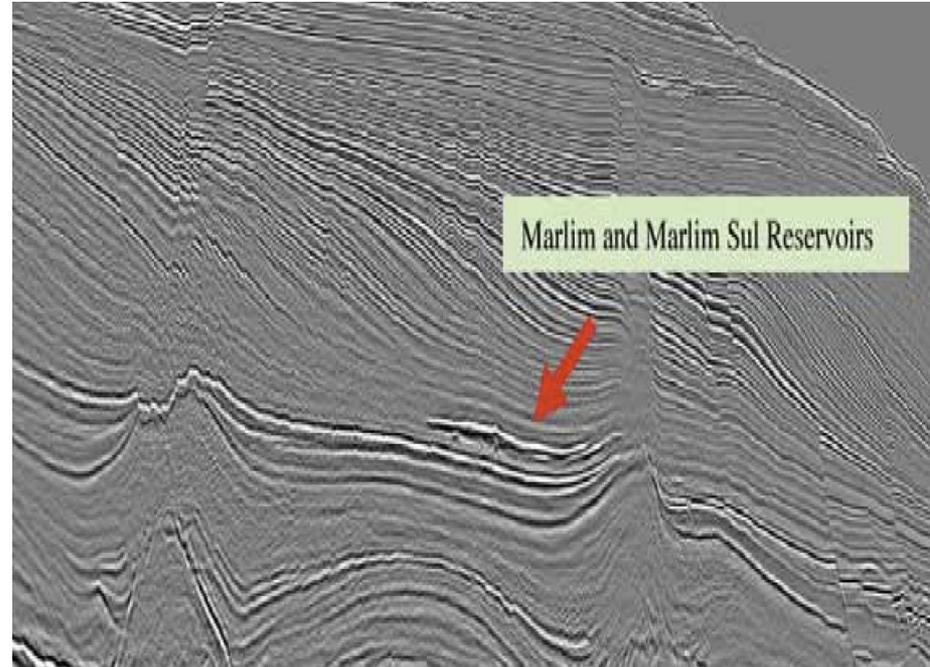
Offshore NL



Offshore NL



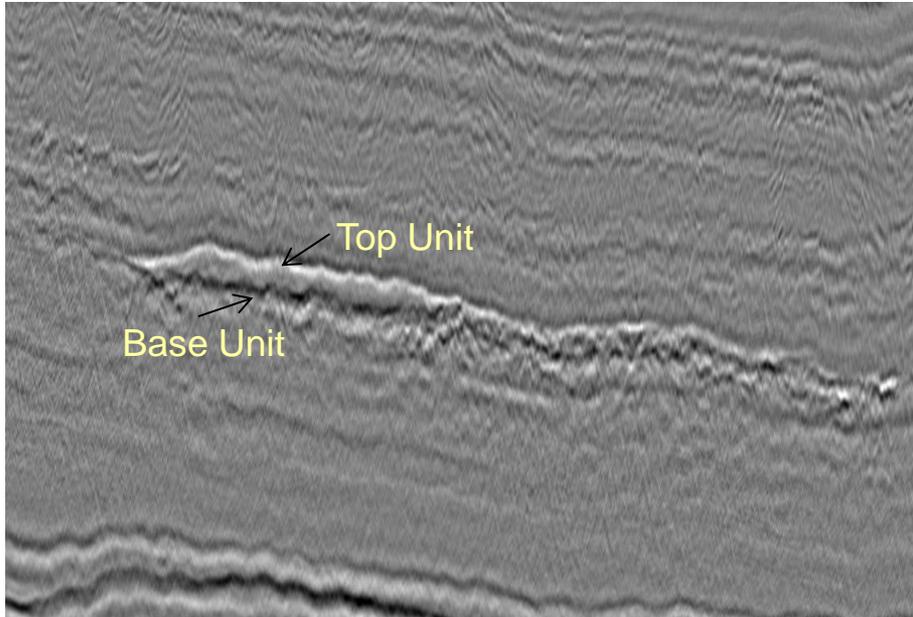
Brazil Field



Johann et al., 2009

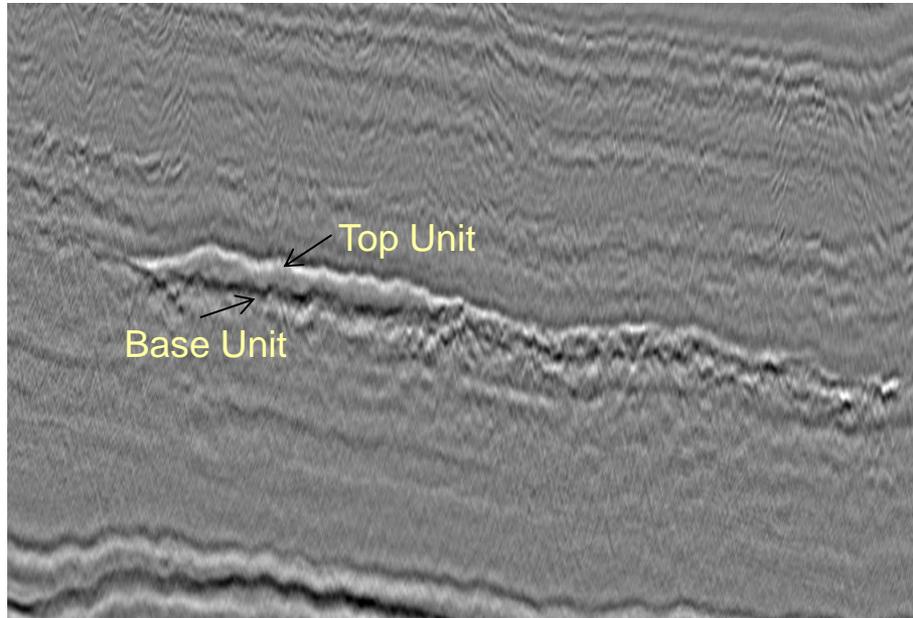
Prospect Example

Offshore NL

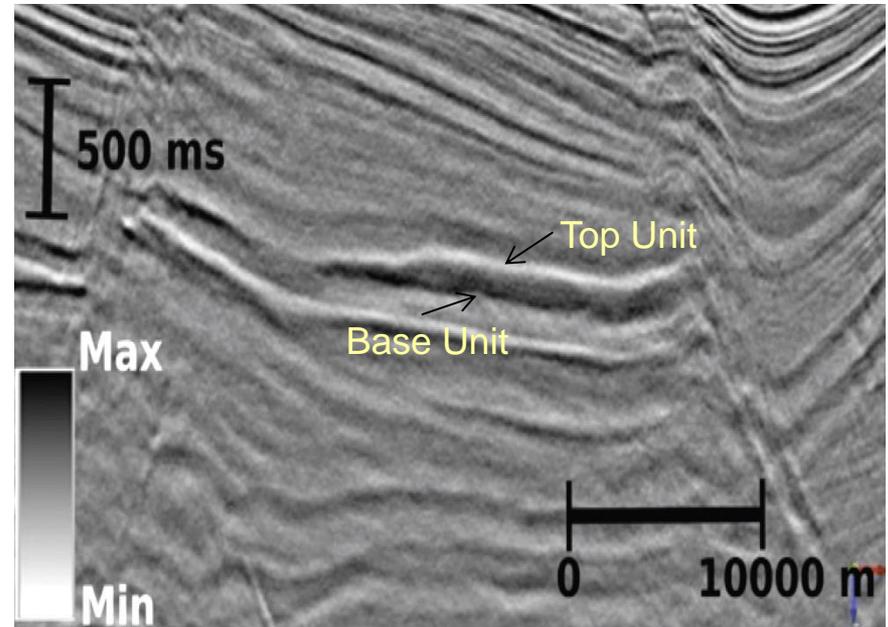


Prospect Example

Offshore NL



Marlim Field, Brazil



Nascimento et al., 2014

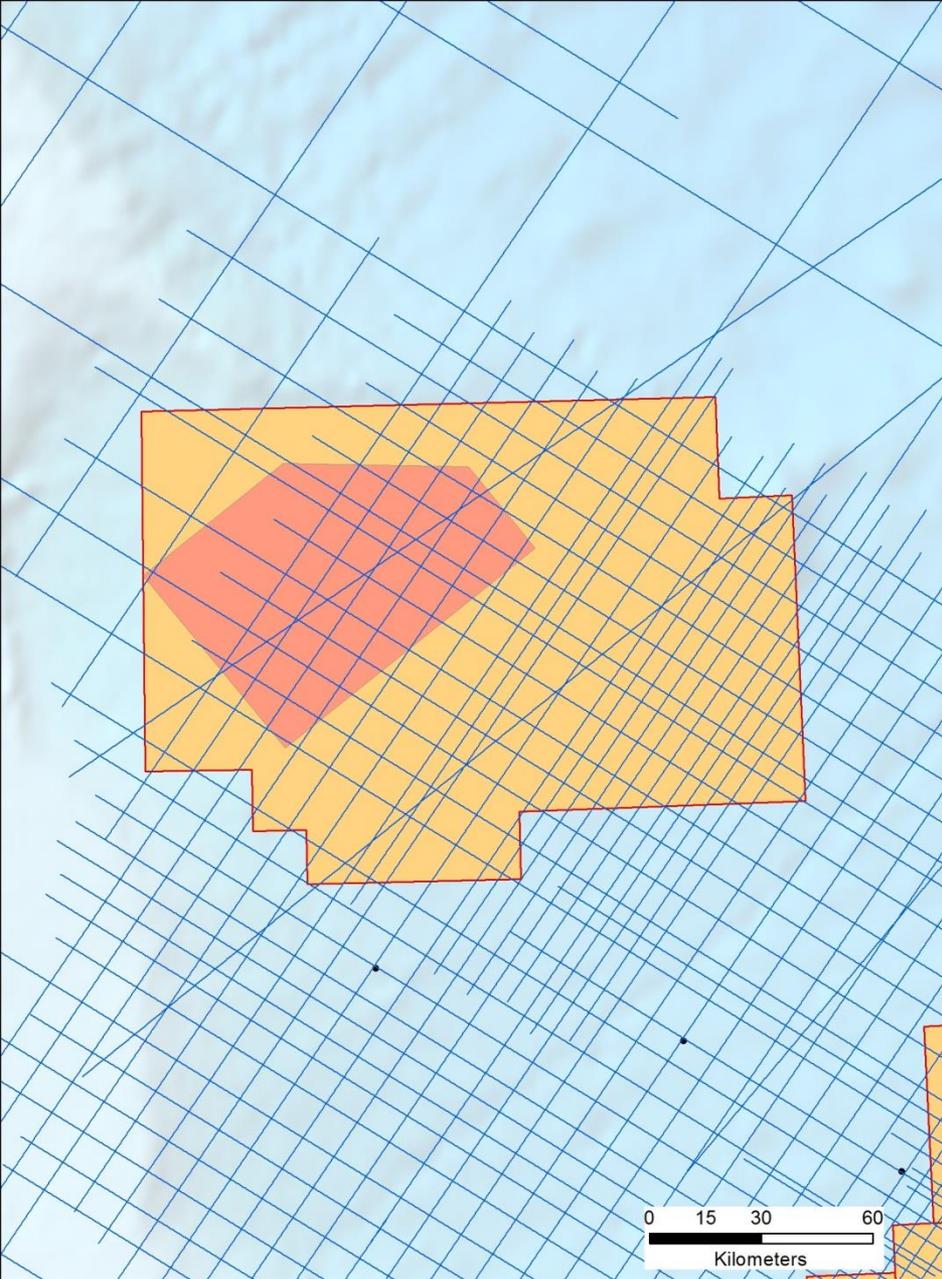
Same Scale

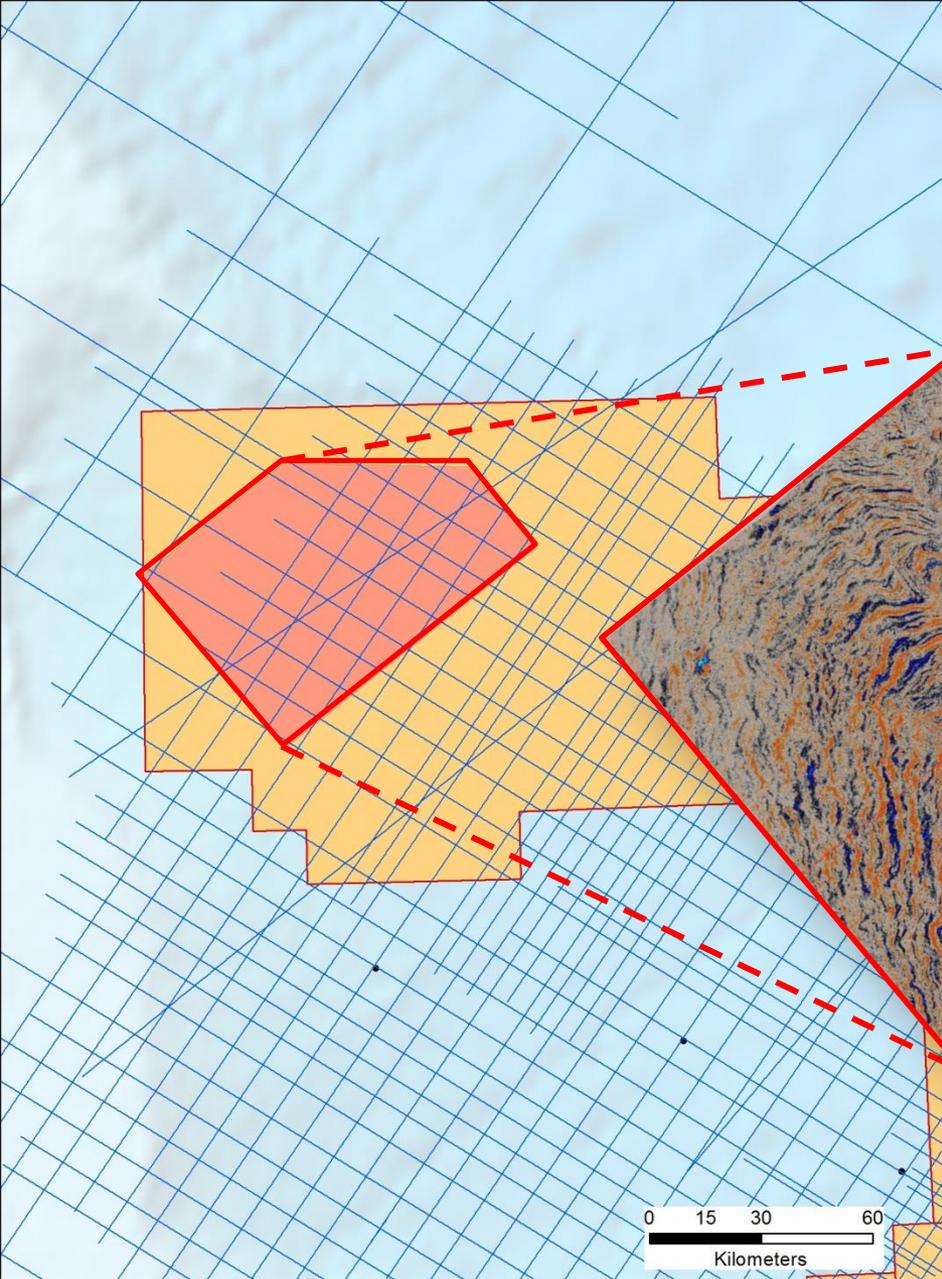
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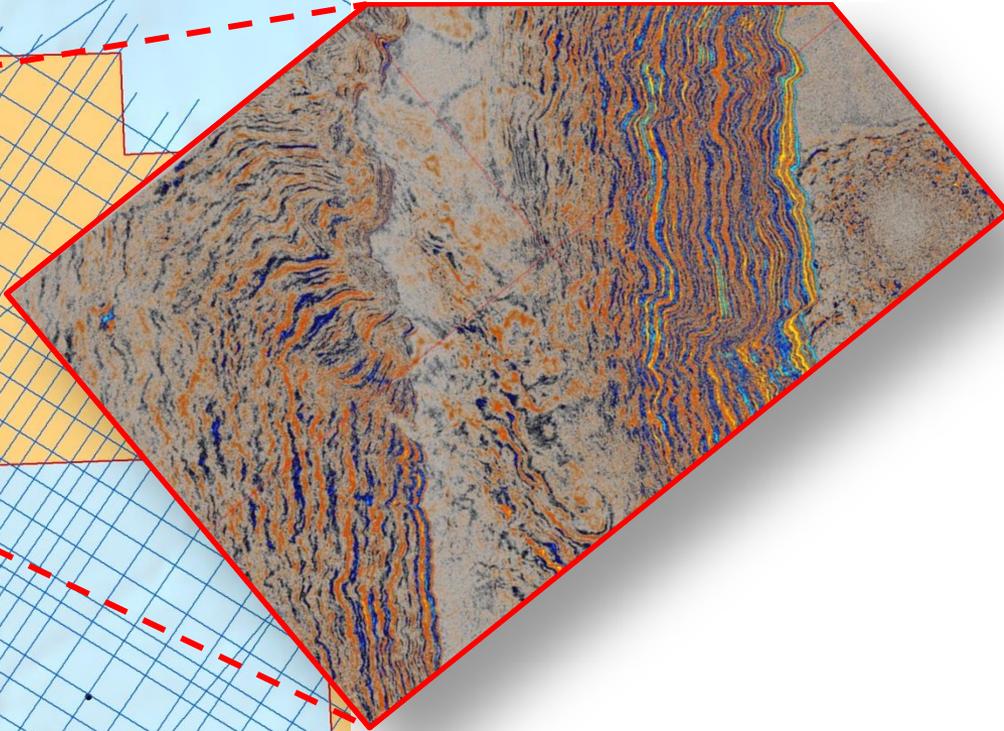
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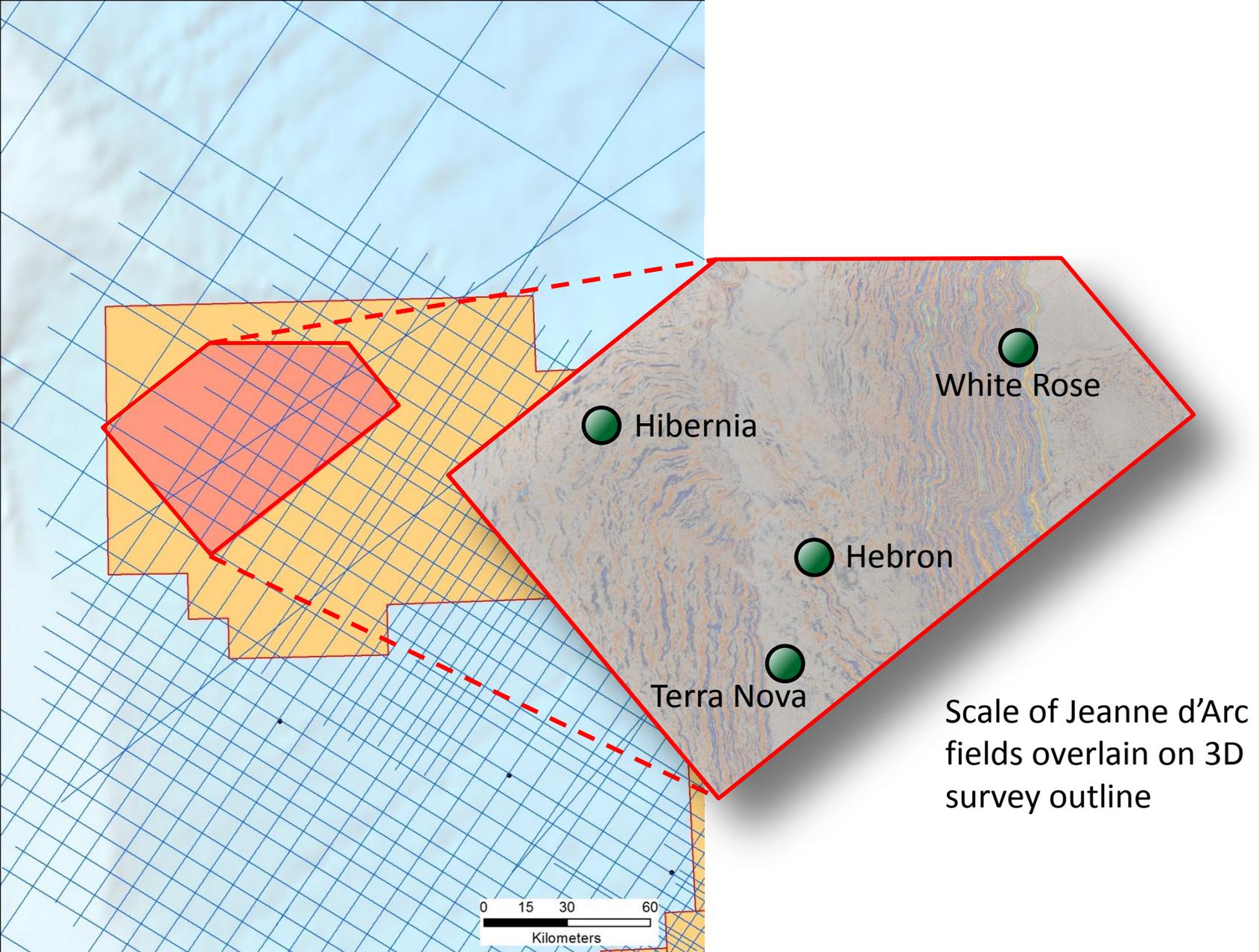
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Time slice - 6000 ms

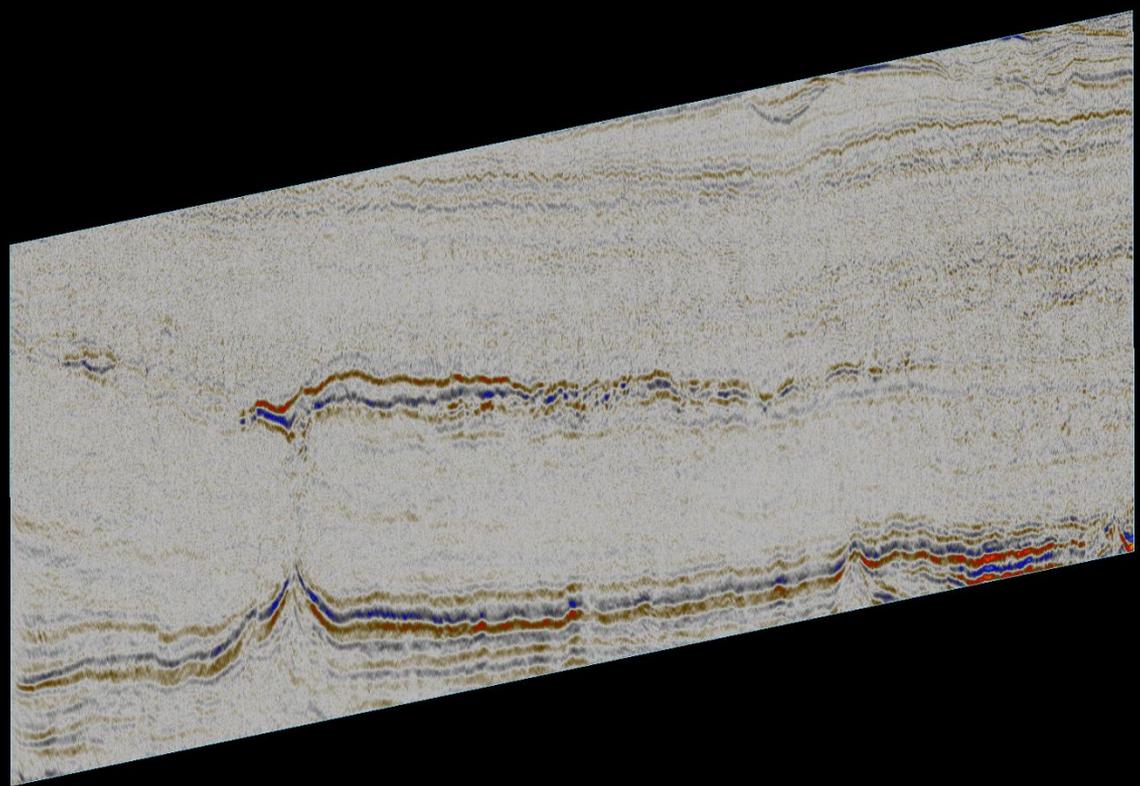
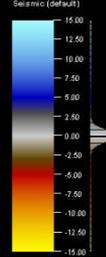




Scale of Jeanne d'Arc fields overlain on 3D survey outline

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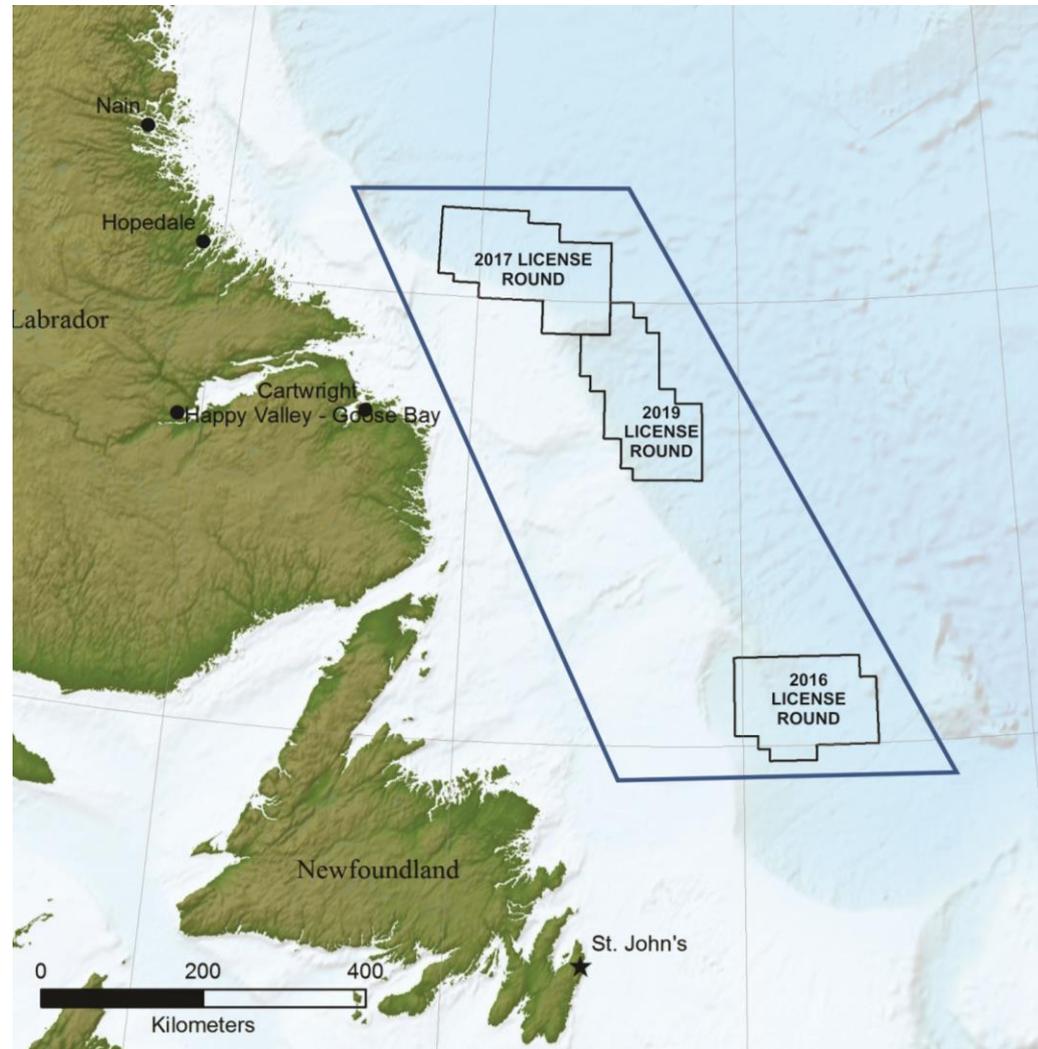
Seismic Image Redacted



Seismic Image Redacted

Seabed Coring

- Petroleum system is a key unknown in our frontier basins
 - Need to reduce that uncertainty
- Partnered with MG3 and AGI with input from
 - TDI-Brooks
 - FIELAX
 - Airbus Space & Defense
- Survey was designed to begin to address the issue
- Covers the upcoming 2016, 2017 & 2019 License Rounds





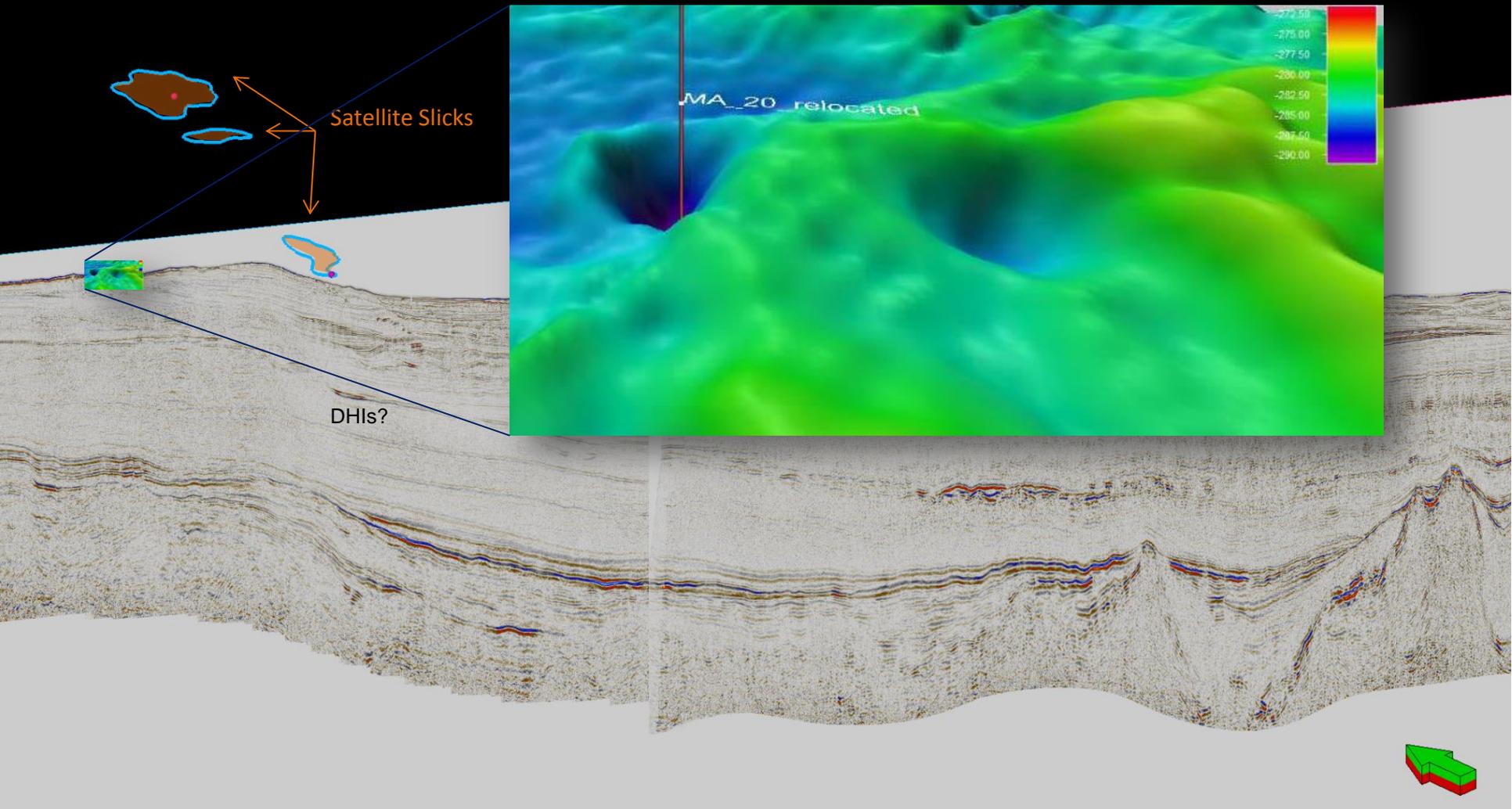
Satellite Slicks



DHIs?

Turbidites





Seabed Coring – Example

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Seabed Coring – Example

Seismic Image Redacted

Seabed Coring – Microseep Profile

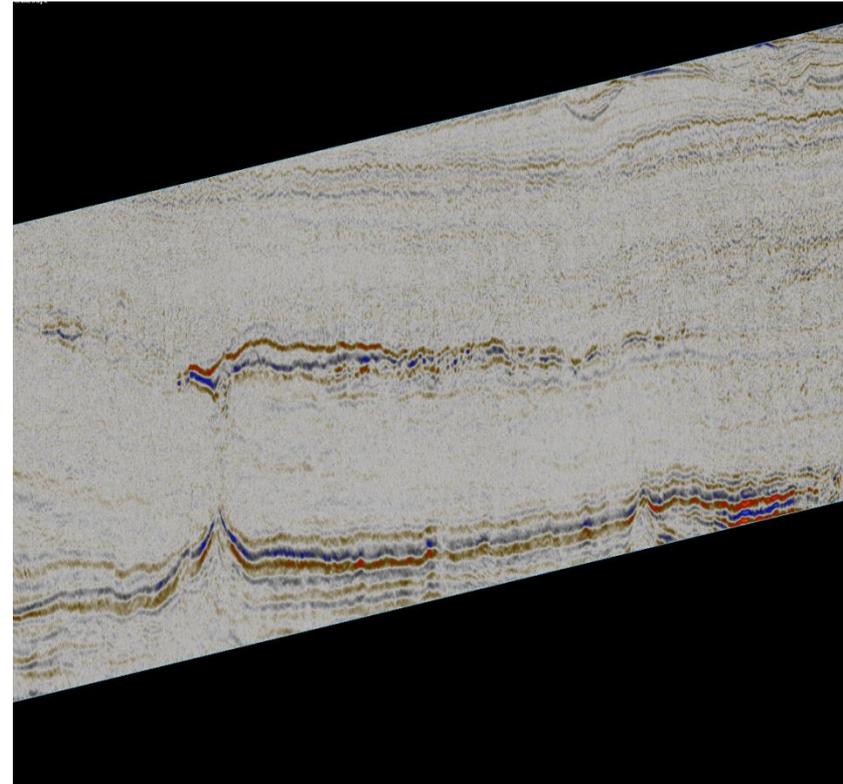
Seismic Image Redacted

Seabed Coring - Results

Seismic Image Redacted

Summary

- New data has unveiled a newly defined lower Tertiary play trend with potential Mesozoic charge – early days in the analysis
- 2D and 3D seismic and seabed coring (multiclient surveys) helping to define new play and prospects
- Seismic Inversion project underway
- Basin Modeling project underway
- Resource Assessment for 2016 license round area will be released in August 2016 (Beicip Franlab)



Thank you

nalcenergy.com/exploration

