Pioneering Development Efforts of the Ordovician-aged Utica/Macasty Shale Plays: Quebec Sedimentary Basins, Eastern Canada*

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Abstract

Since 2005, 30 new wells were drilled in southern Quebec. The Ordovician calcareous shales of the Utica Group, rich in organic matter, are the main target of recent exploration efforts. The calcareous and organic-rich Utica Shale belongs to the Early Paleozoic Saint Lawrence Lowlands geological province. At its maximal vertical extent, the shale is 300 meters of graptolitic, brownish, organic rich and laminated calcareous mudstone. Similar to the Eagle Ford Shale, the calcitic mineralogy of the Utica makes the shale competent, hard and brittle. The highest TOC reaches 6% and indicates a Type II organic matter origin. Current knowledge has led operators to subdivide the shale gas potential into different play types. In general, the gas encountered is a low (wet) to high maturity (dry) gas. To date, most operations were performed in the deep thermogenic shale gas play (1000-2000 meters). With OGIP estimates ranging from 120 to 160 BCF per section, the play is considered promising.

Located in the Gulf of St. Lawrence in Quebec, Anticosti Island extends over an area of 7,943 sq km (3,103 sq mi). The current exploration phase recognizes the potential of the Middle Ordovician Macasty Shale as a liquid-rich resource play (potential for light oil/condensate production). The Macasty has good to excellent organic richness (Type II). At its deepest point of the island the shale attained its full thermal maturity for Oil Generation (Late Oil Window based on Rock-Eval/Tmax data). The Macasty porosity compares favorably with other North American shale resource plays which may be a positive indicator for potential resources initially-in-place. Technical evaluation indicates that the level of thermal maturity observed thus far for the shale in the Deep Macasty Fairway compares favorably with published findings for the oil-rich Utica/Point Pleasant Shale in Ohio and the Eagle Ford Shale in Texas.

The exploration of Ordovician shales in Quebec is a combination of science, intuition, perseverance and adaptability. But the premises of the story remain similar to those found in other sedimentary basins: the presence of brittle shale which acted as a major source rock. The people

living in Quebec are energy intensive and more than half of this energy comes from oil and natural gas. The development of oil and gas potential of Québec will generate significant economic benefits for citizens and will have positive impacts on the competitiveness of its sources of supply.

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Luc Massé, Reservoir Engineer, Junex inc.
Peter K. Dorrins, President and CEO, Junex inc.
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Theme 2: Unconventional Resources: North American Plays
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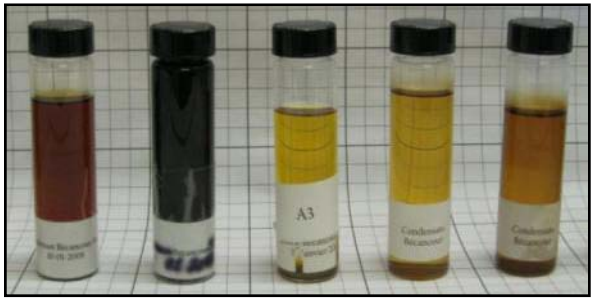
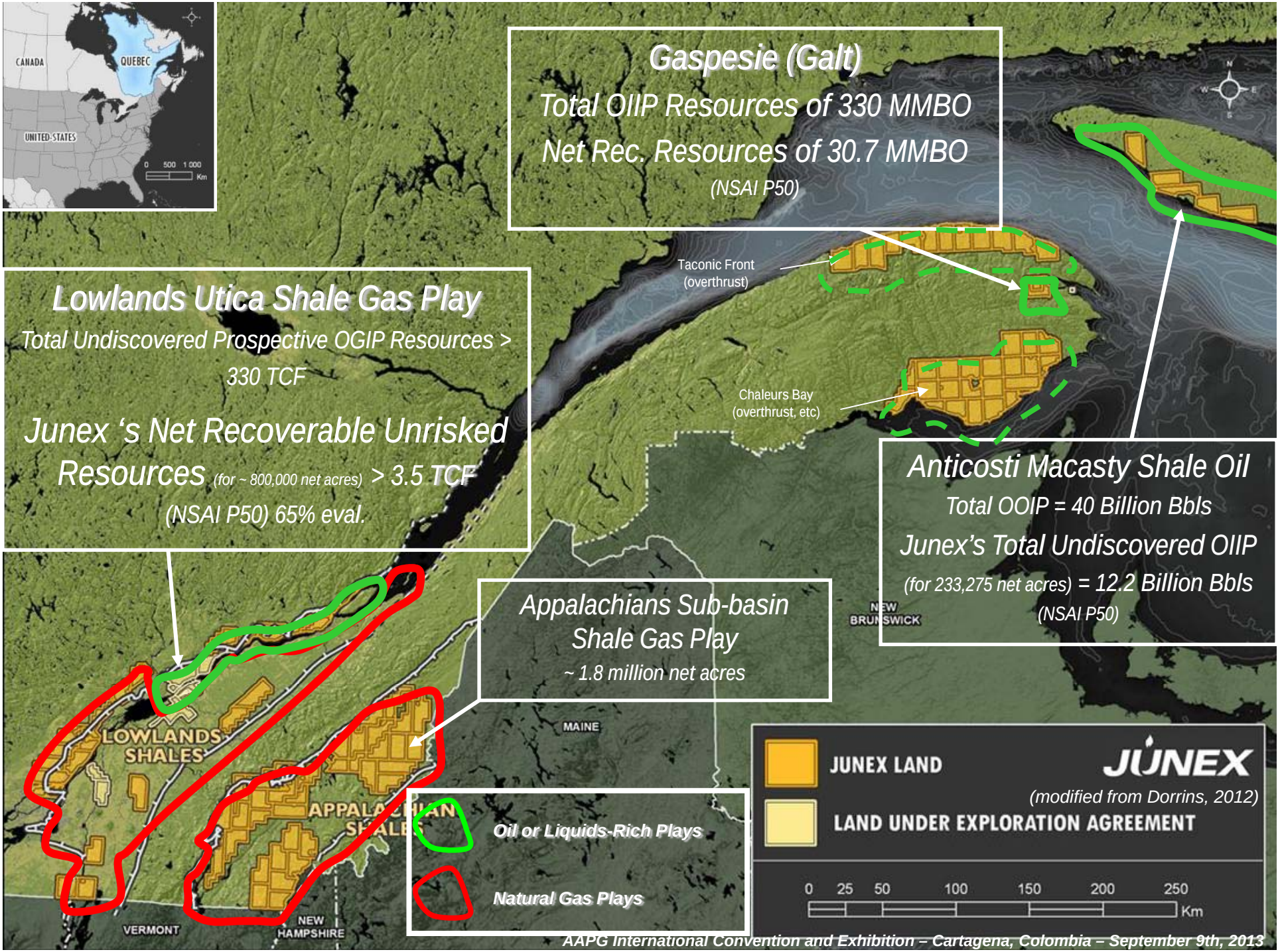
Prospective Statement

This document contains prospective statements which state the expectations of management with regards to the growth, the operation results, the return and the commercial prospects and occasions for future business deals for Junex Inc and its projects. When necessary, verbs like " to anticipate "to be of said opinion", "to expect", "to intend", "to estimate", "will be" and similar expressions were employed to announce these prospective statements. These statements state the statements that which the management holds for truth and are founded on information that the company currently possesses. The prospective statements involve considerable risks, uncertainties and assumptions. A certain number of factors could impact upon the results really obtained, the return actually reached or the achievements and differ considerably from the results in question or which are implicit in the prospective statements. Although the prospective statements appearing in this document are founded on what the management of Junex believes to be reasonable assumptions, Junex Inc cannot guarantee to the possible investors that the real results will be in conformity with these prospective statements.

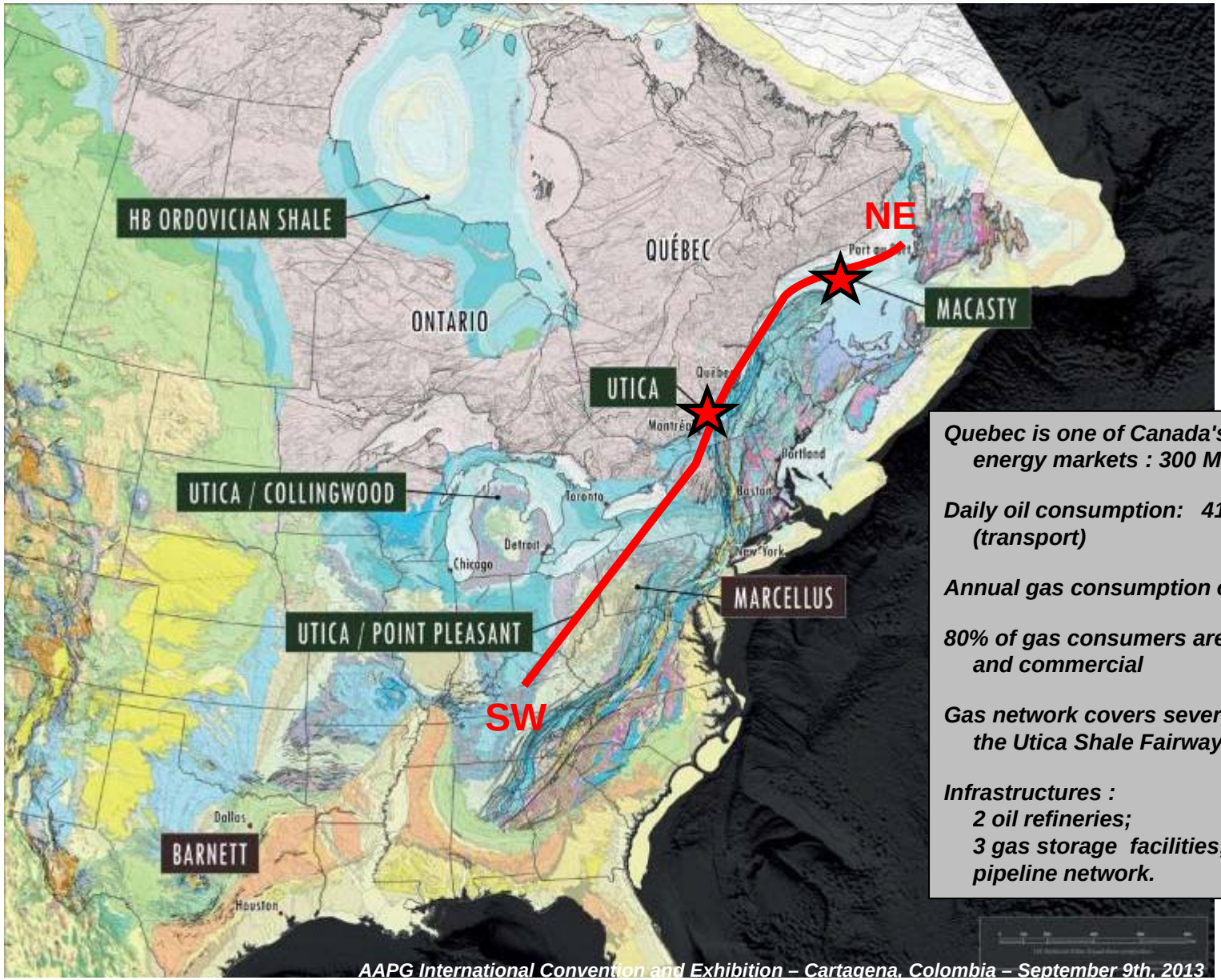
Junex – A Leader in Exploration in Quebec

- ***Created in 1999 & listed on the TSX Venture Exchange in June 2001 and headquartered in Quebec City***
- ***Holds exploration rights on >5 million acres in Quebec***
- ***Key Player in the St. Lawrence Lowlands Basin (land assembled 2002-05)***
- ***Largest Net Acreage Landholder in Utica Shale Gas play at ~800,000 net acres in all three Utica Play Fairways***
    - ***Total Undiscovered Prospective OGIP Resources > 45 TCF and***
    - ***Net Recoverable Unrisked Resources > 3.5 TCF*** ***(NSAI P50)***
    - ***Controls virtually all of the Utica liquids-rich belt***
- ***JNX has significant position of 233,275 net acres in the Deep Macasty Shale Fairway on Anticosti Island – Potential of 12.2 Billion Barrels Undiscovered Shale Oil Initially-in-Place ("OIIP")*** ***(NSAI P50)***




CANADA
QUEBEC
UNITED STATES
0 500 1 000
Km
Gaspesie (Galt)
Total OIIP Resources of 330 MMBO
Net Rec. Resources of 30.7 MMBO
(NSAI P50)
Taconic Front
(overthrust)
Chaleurs Bay
(overthrust, etc)
Lowlands Utica Shale Gas Play
Total Undiscovered Prospective OGIP Resources > 330 TCF
Junex 's Net Recoverable Unrisked Resources (for ~ 800,000 net acres) > 3.5 TCF
(NSAI P50) 65% eval.
Anticosti Macasty Shale Oil
Total OOIP = 40 Billion Bbls
Junex's Total Undiscovered OIIP
(for 233,275 net acres) = 12.2 Billion Bbls
(NSAI P50)
Appalachians Sub-basin Shale Gas Play
~ 1.8 million net acres
NEW BRUNSWICK
MAINE
LOWLANDS SHALES
APPALACHIAN SHALE
VERMONT
NEW HAMPSHIRE
Oil or Liquids-Rich Plays
Natural Gas Plays
JUNEX LAND
LAND UNDER EXPLORATION AGREEMENT
JUNEX
(modified from Dorrins, 2012)
0 25 50 100 150 200 250
Km

Ordovician Petroleum System of NE America



Quebec is one of Canada's largest energy markets : 300 Mboe/year

Daily oil consumption: 410,000 bbl (transport)

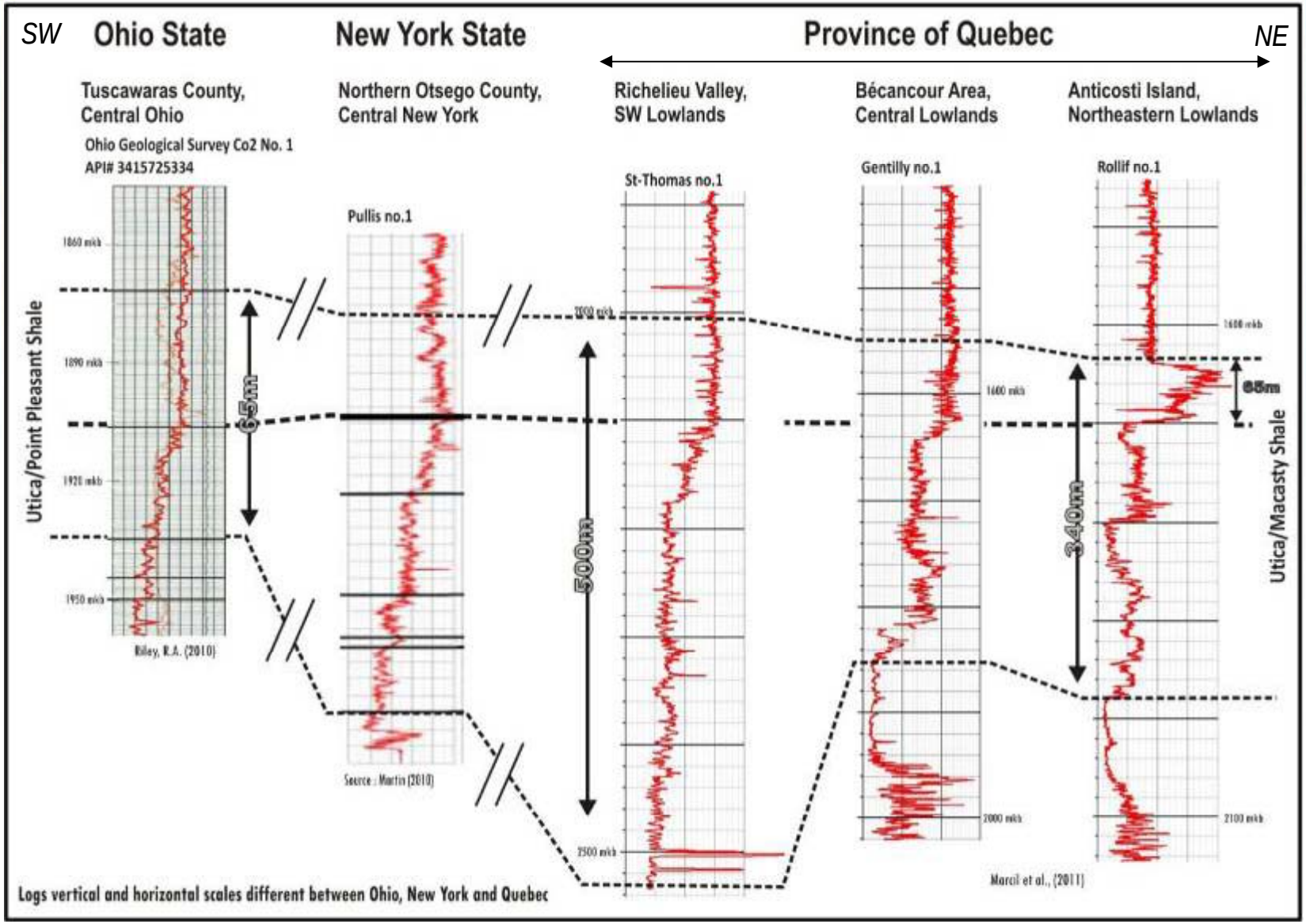
Annual gas consumption of 180 Bcf

80% of gas consumers are industrial and commercial

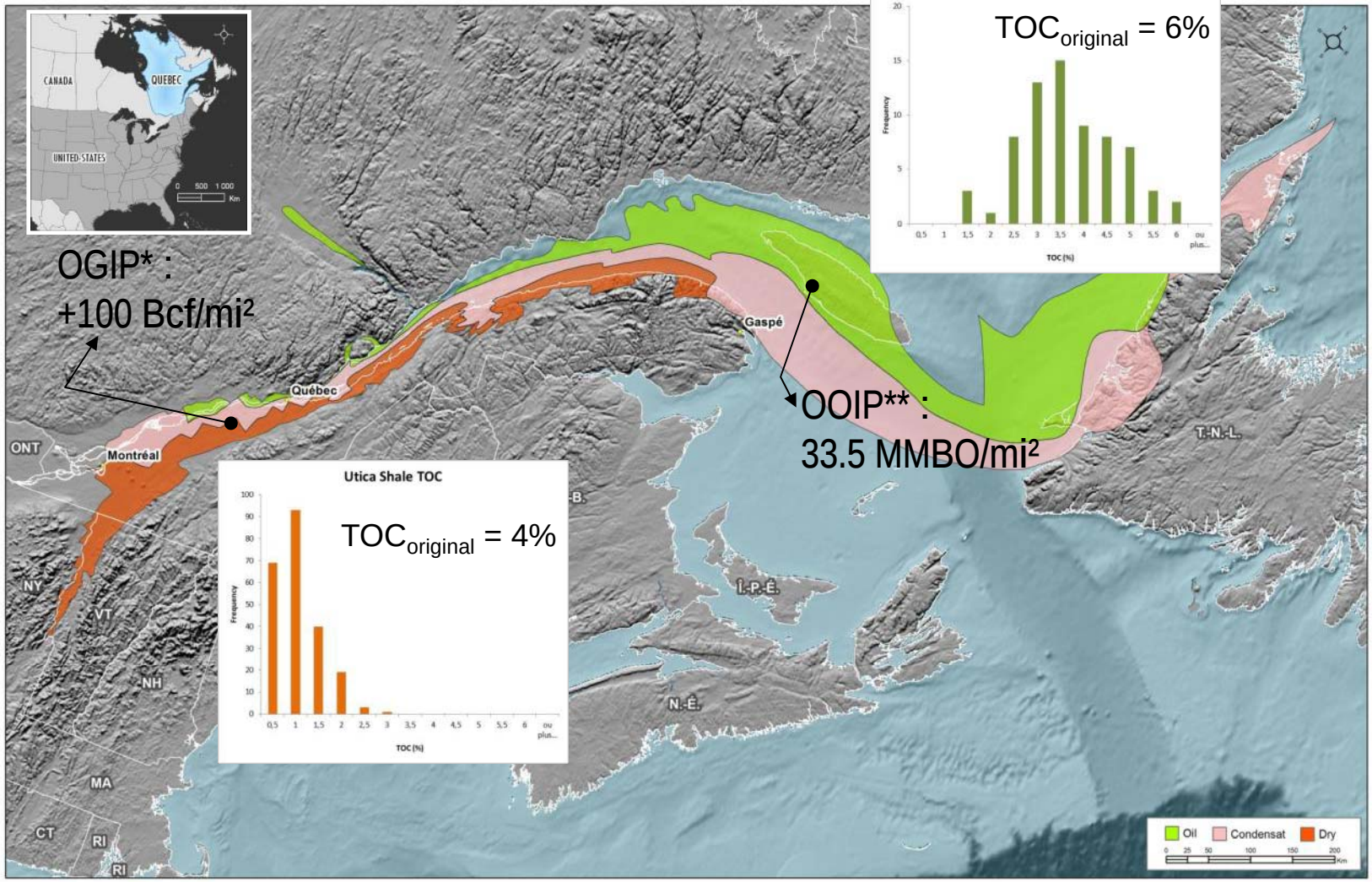
Gas network covers several areas in the Utica Shale Fairway

Infrastructures :
- ***2 oil refineries;***
- ***3 gas storage facilities;***
- ***pipeline network.***

NE America – Ordovician Shale Correlation



Ordovician Shale Thermal Maturity Zonation



* From various external reports published in 2009, 2010 and 2012

**From September 2011 – Netherland Sewell and Associates Inc. Resource Estimates Independant Report for South Anticosti Island

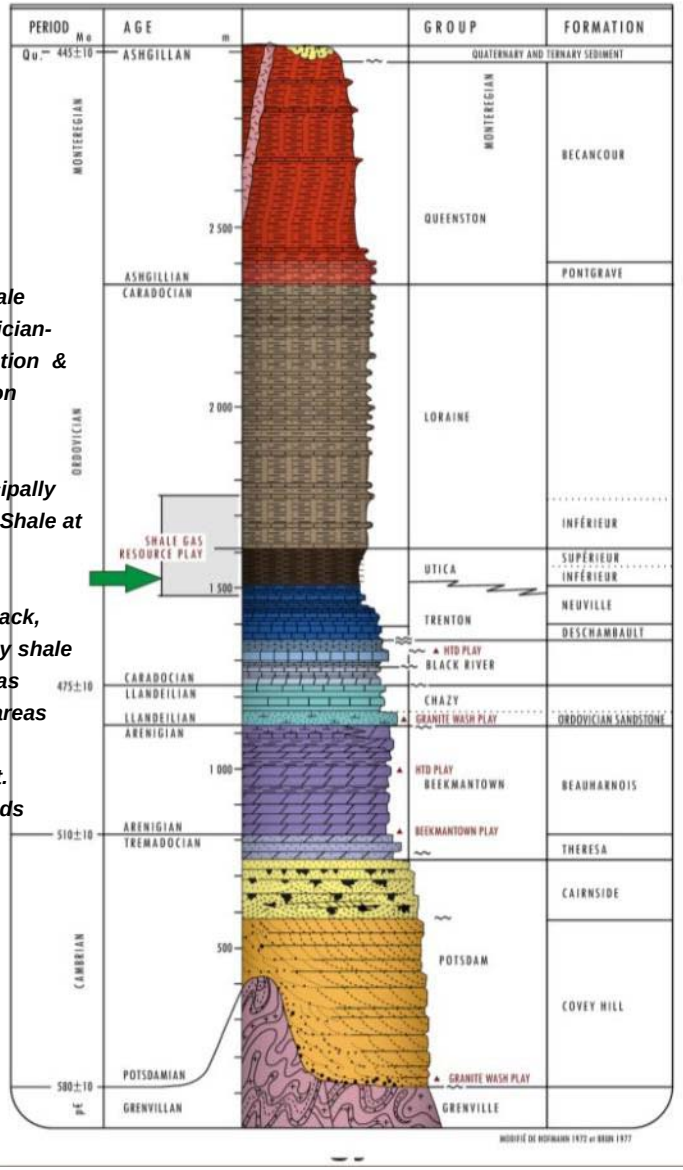
Utica Shale Geology

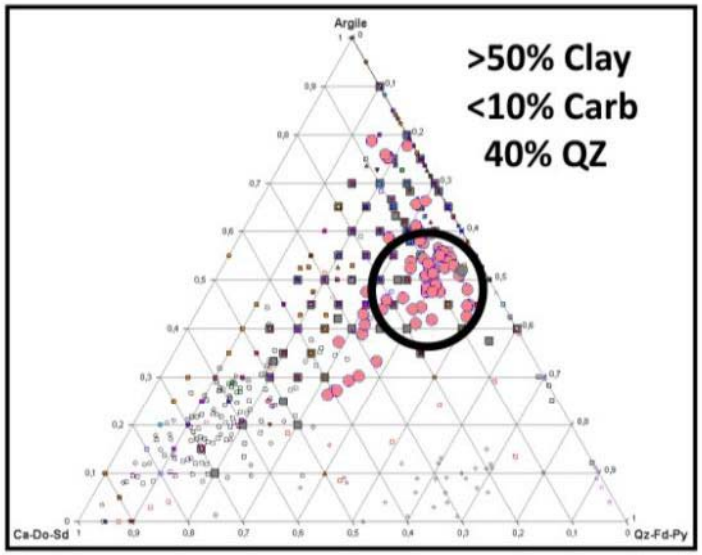
Prospective Shale Intervals – Ordovician-aged Utica Formation & Lorraine Formation Shales

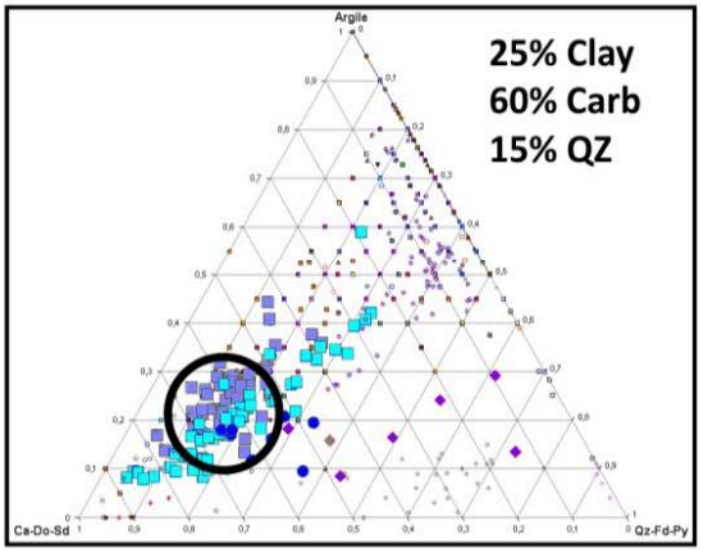
Industry is principally focused on Utica Shale at this time

Utica - mainly black, organic-rich, limey shale with significant gas content in many areas

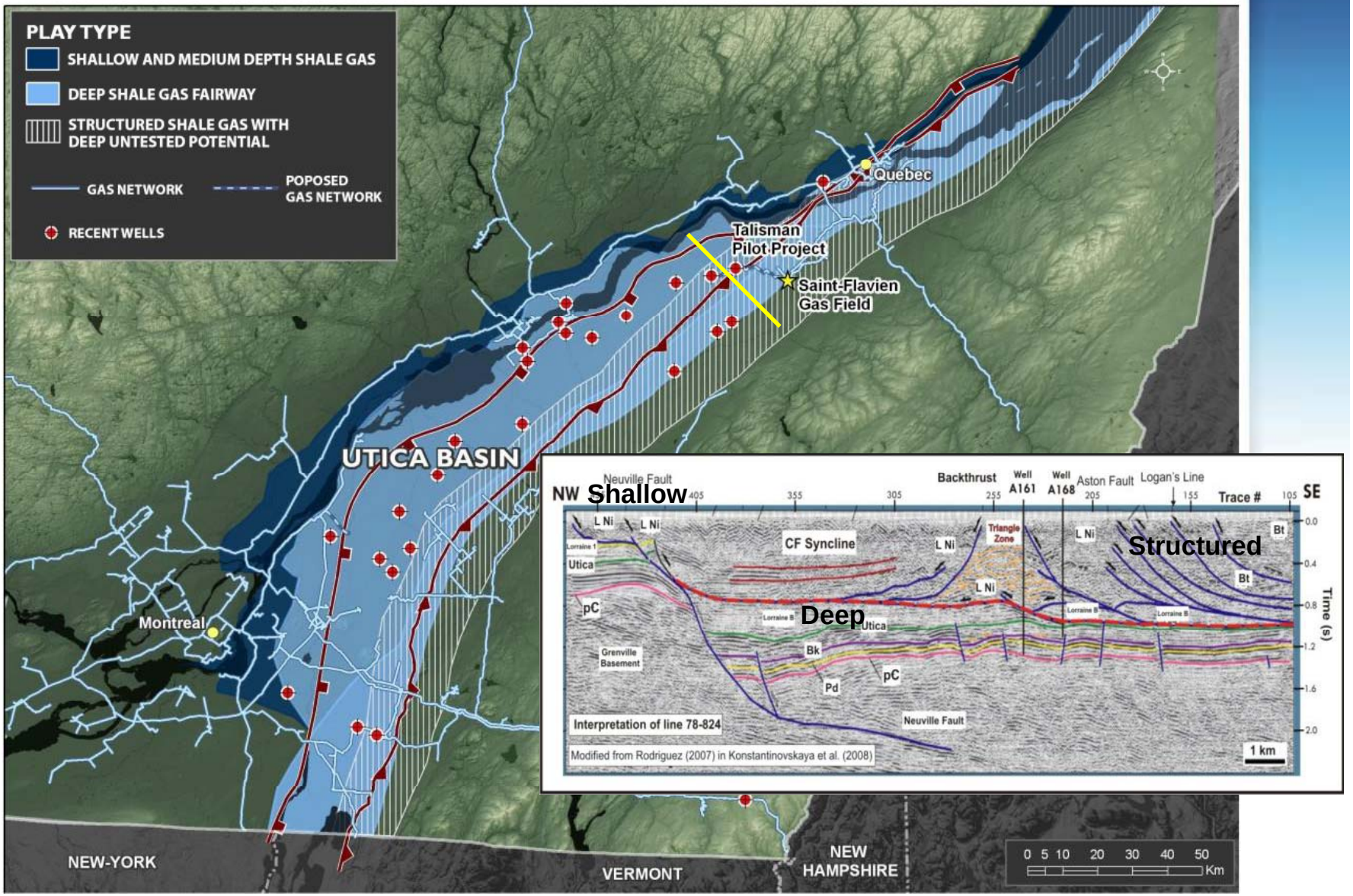
Widespread in St. Lawrence Lowlands



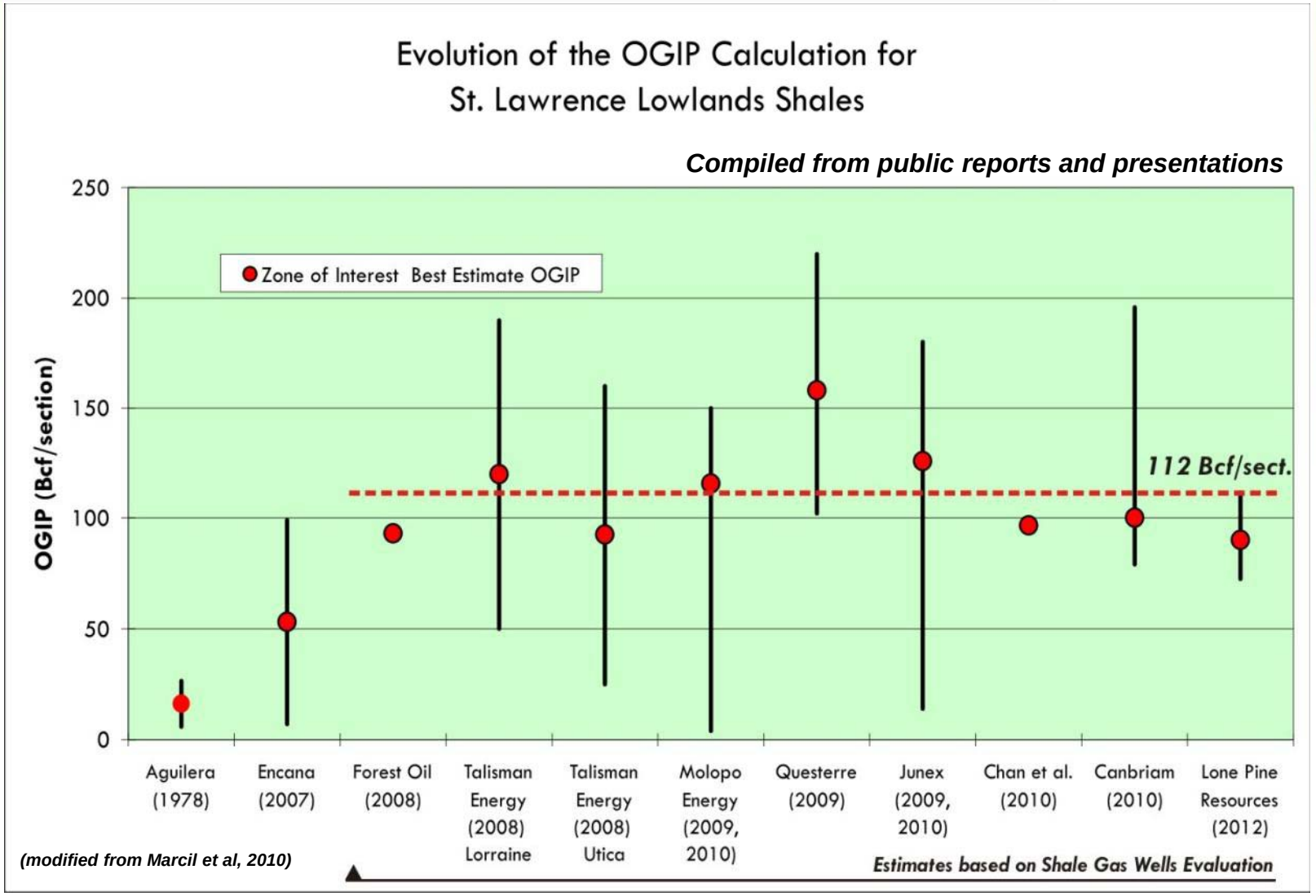




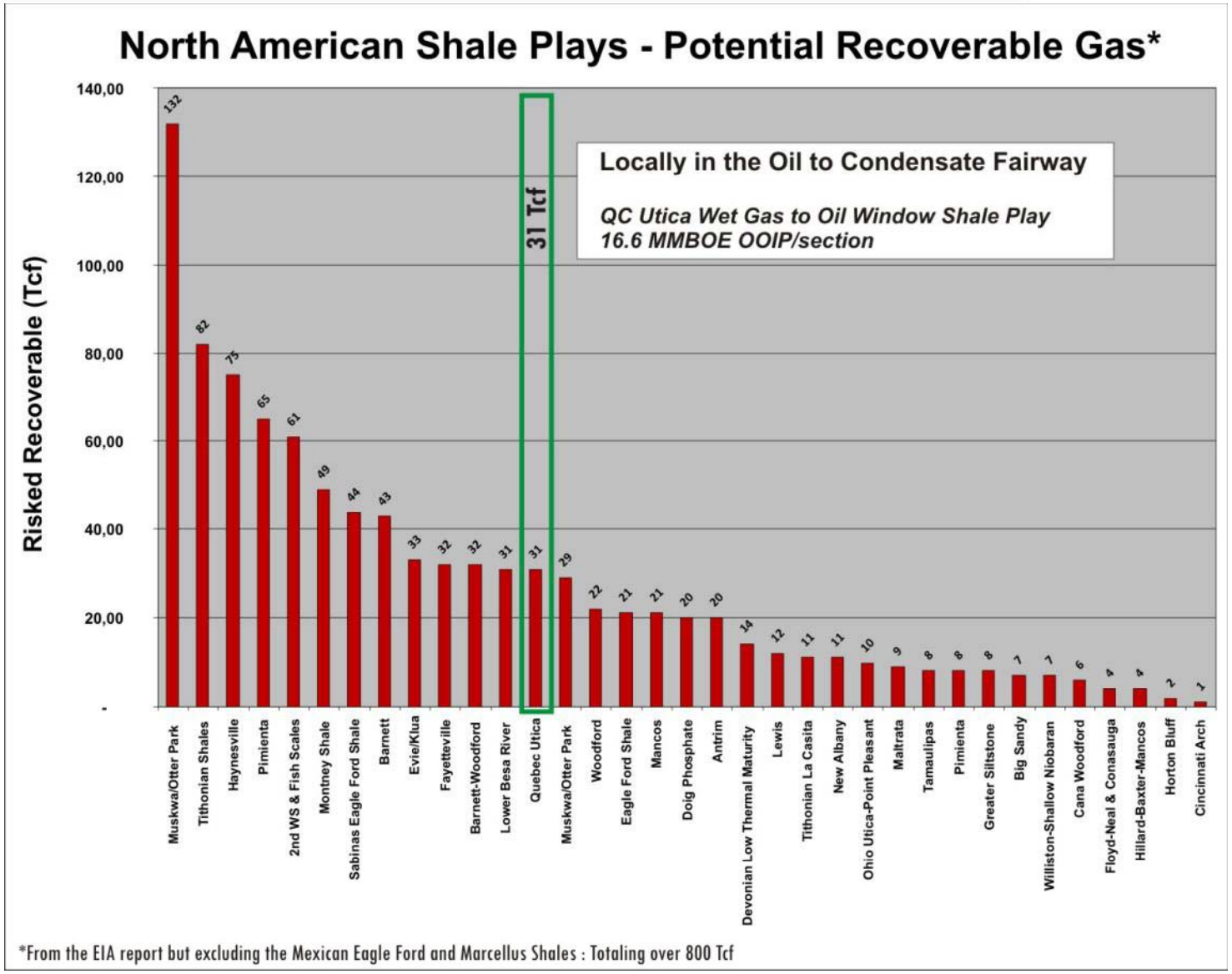
Defining the exploration fairways



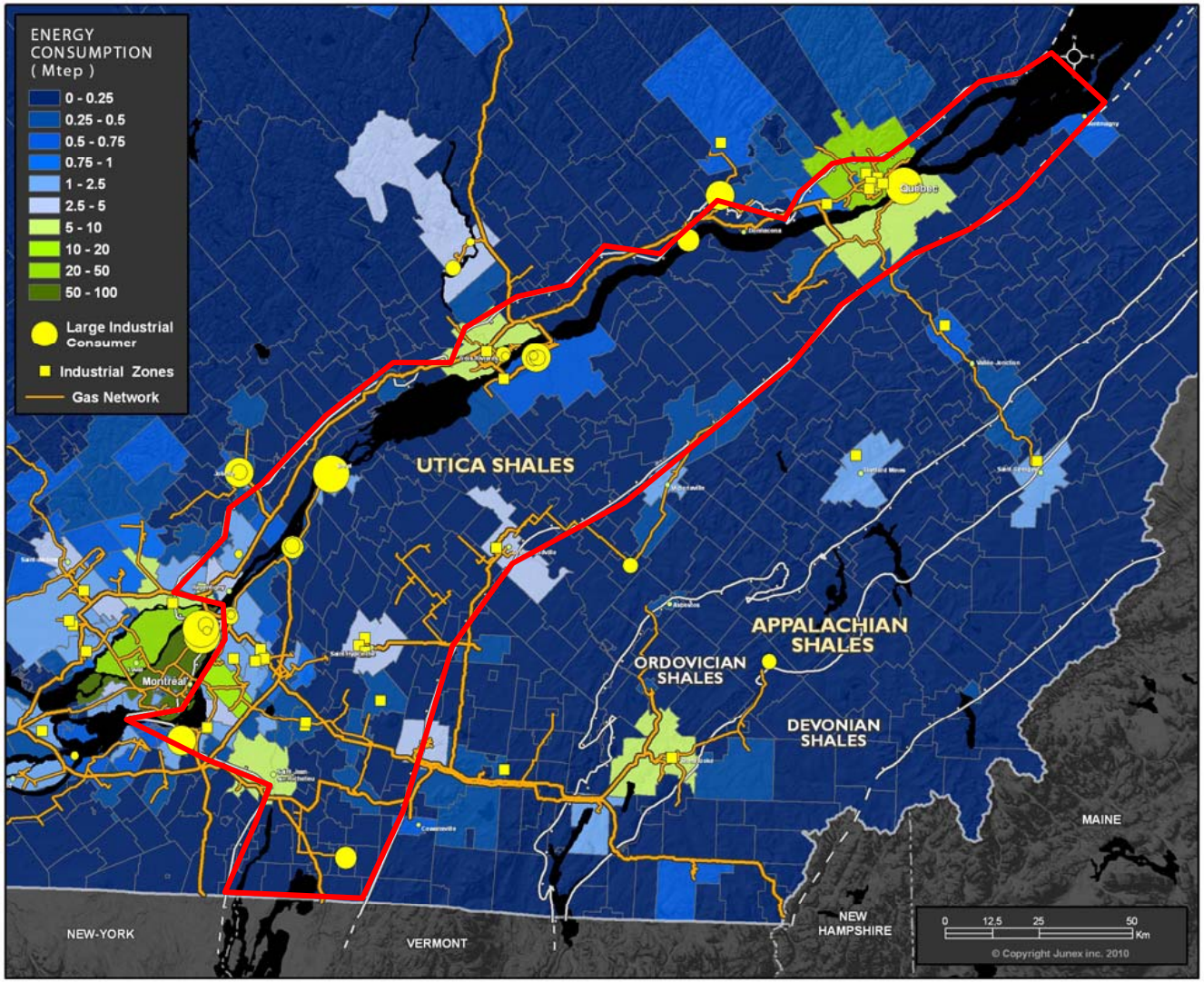
Utica Shale Original Gas-in-Place Estimates



A world-class Gas Resources



Infrastructure & Energy Consumption



Area with the strongest energy consumption are in green colors

Quebec is one of Canada's largest energy markets : 300 Mboe/year

Daily oil consumption: 410,000 bbl (transport)

Annual gas consumption of 180 Bcf

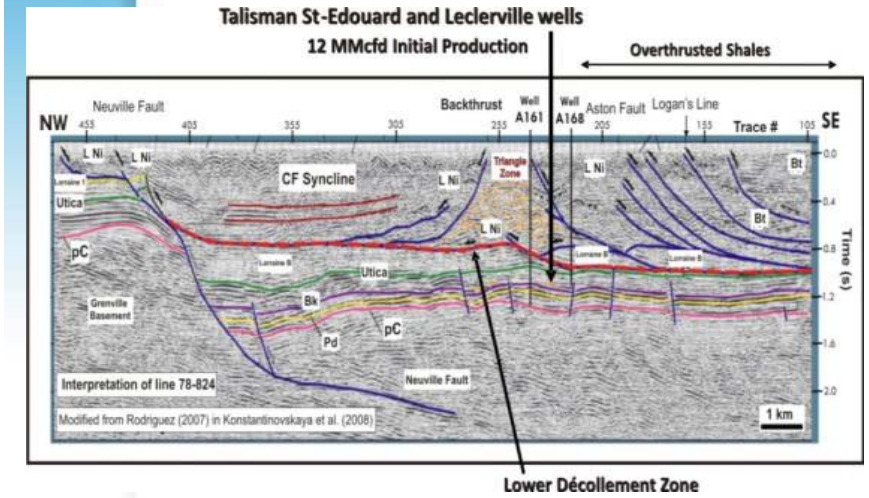
80% of gas consumers are industrial and commercial

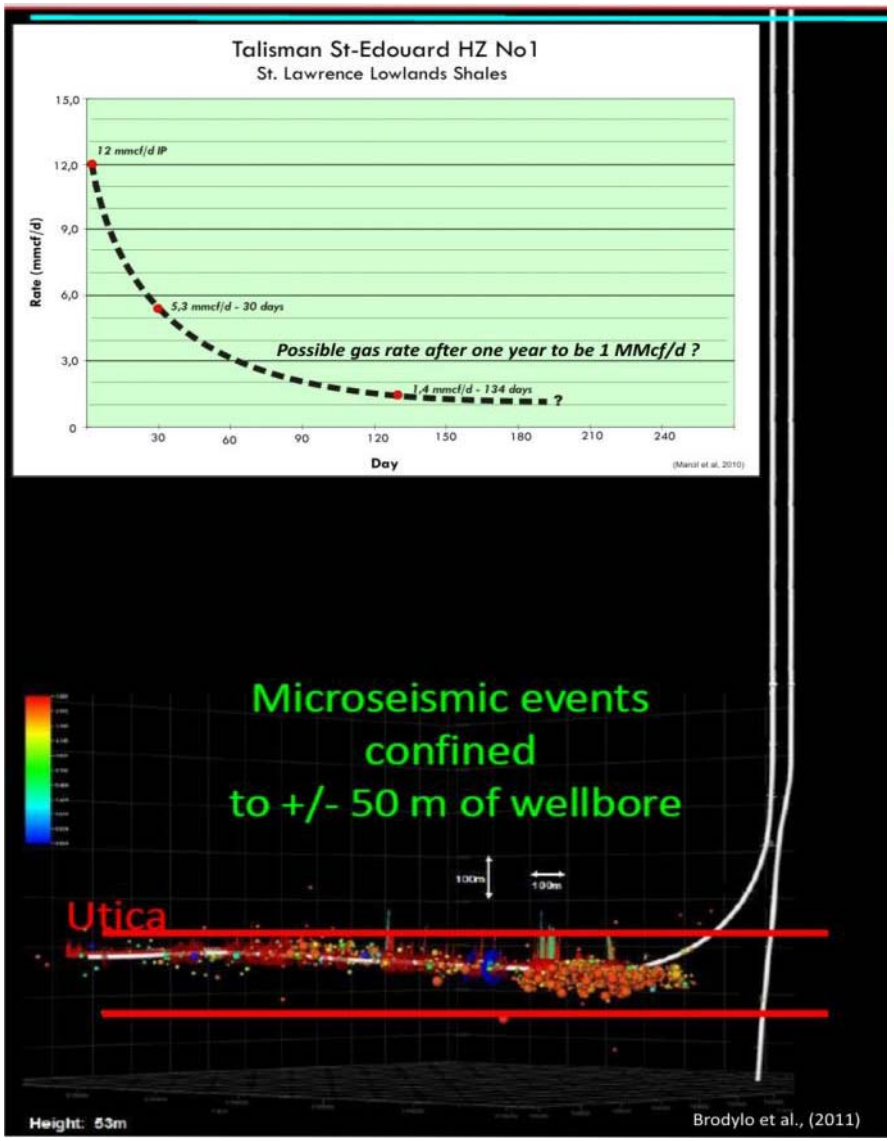
Gas network covers several areas in the Utica Shale Fairway

Infrastructures :
2 oil refineries;
3 gas storage facilities;
pipeline network.

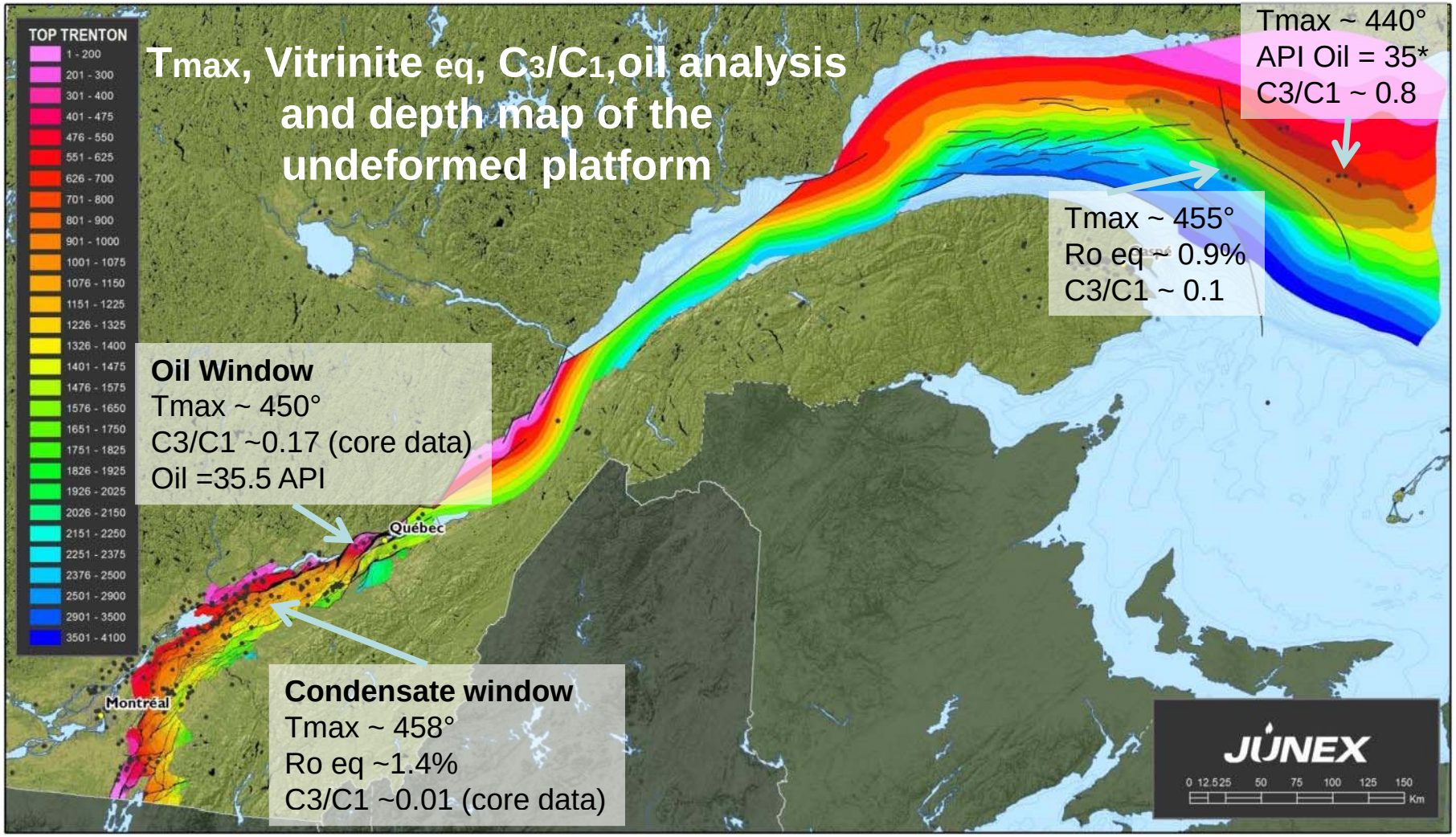
First long-term testing

Stimulated Horizontal Well - Deep Shale



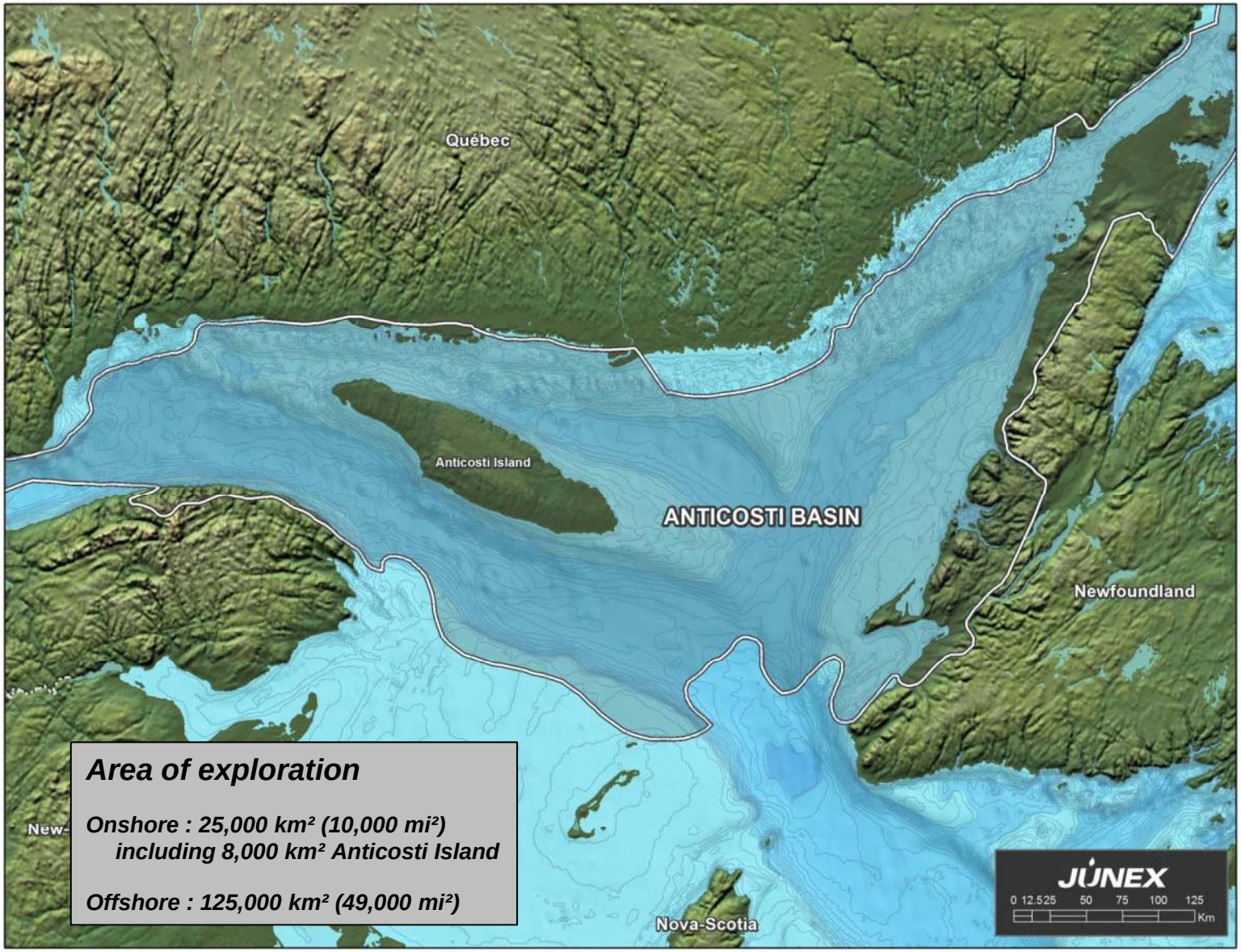


Quebec's Middle Ordovician Carbonate basins



***From Pétrolia Press realease, 2011/02/09**
Data from Junex database and Thériault (2008)

Anticosti Basin



Area of exploration

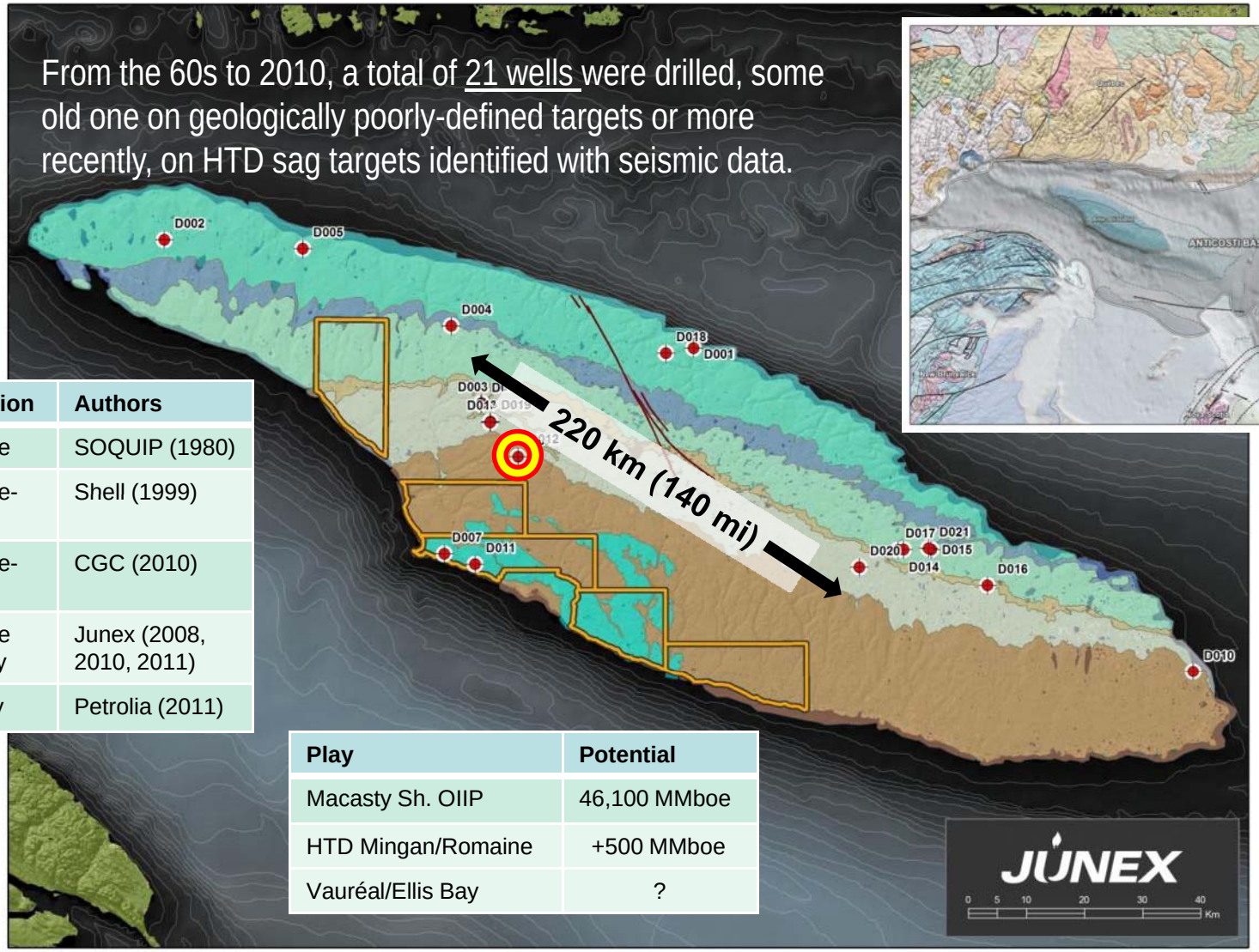
Onshore : 25,000 km² (10,000 mi²)
including 8,000 km² Anticosti Island

Offshore : 125,000 km² (49,000 mi²)

Anticosti Island Geology and Petroleum Potential

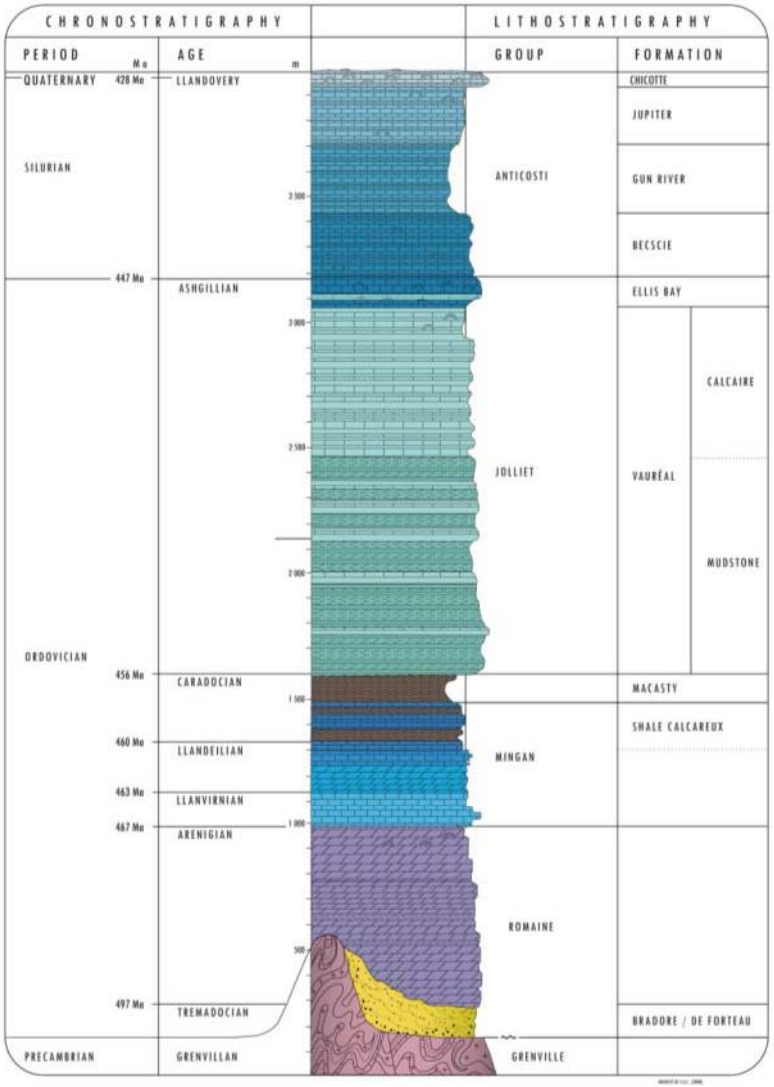
From the 60s to 2010, a total of 21 wells were drilled, some old one on geologically poorly-defined targets or more recently, on HTD sag targets identified with seismic data.

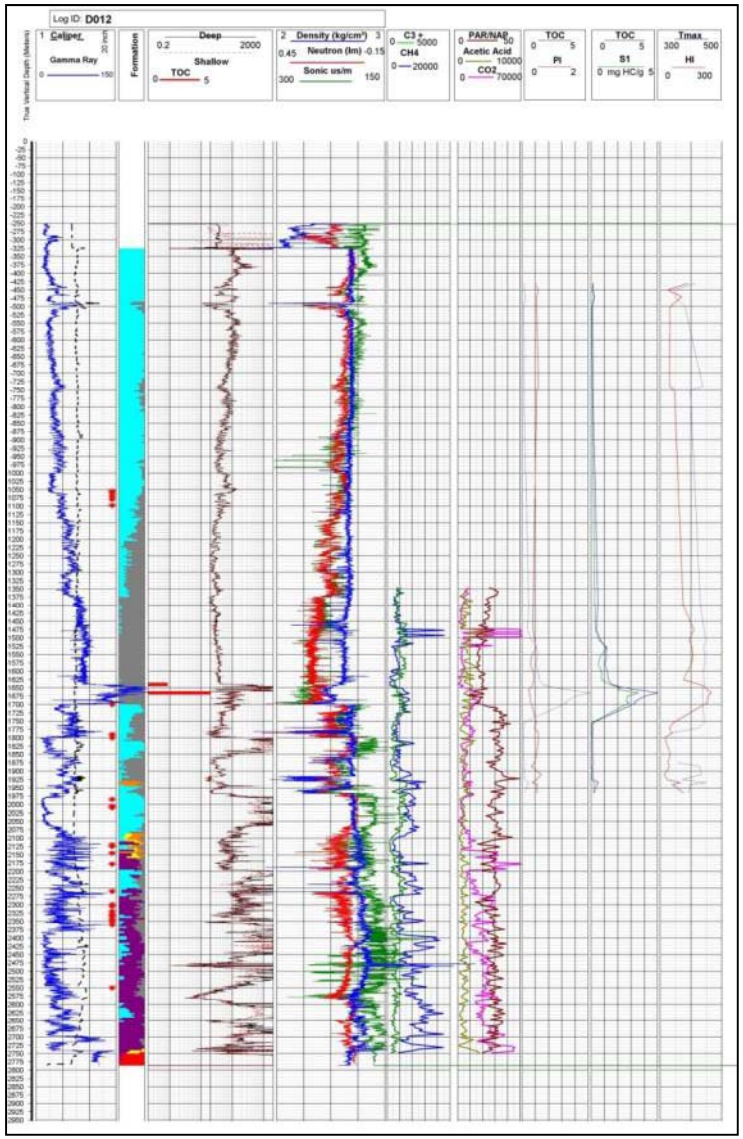
Evaluation	Authors
Romaine	SOQUIP (1980)
Romaine-Mingan	Shell (1999)
Romaine-Mingan	CGC (2010)
Romaine MacAsty	Junex (2008, 2010, 2011)
Macasty	Petrolia (2011)



Play	Potential
Macasty Sh. OIIP	46,100 MMboe
HTD Mingan/Romaine	+500 MMboe
Vauréal/Ellis Bay	?

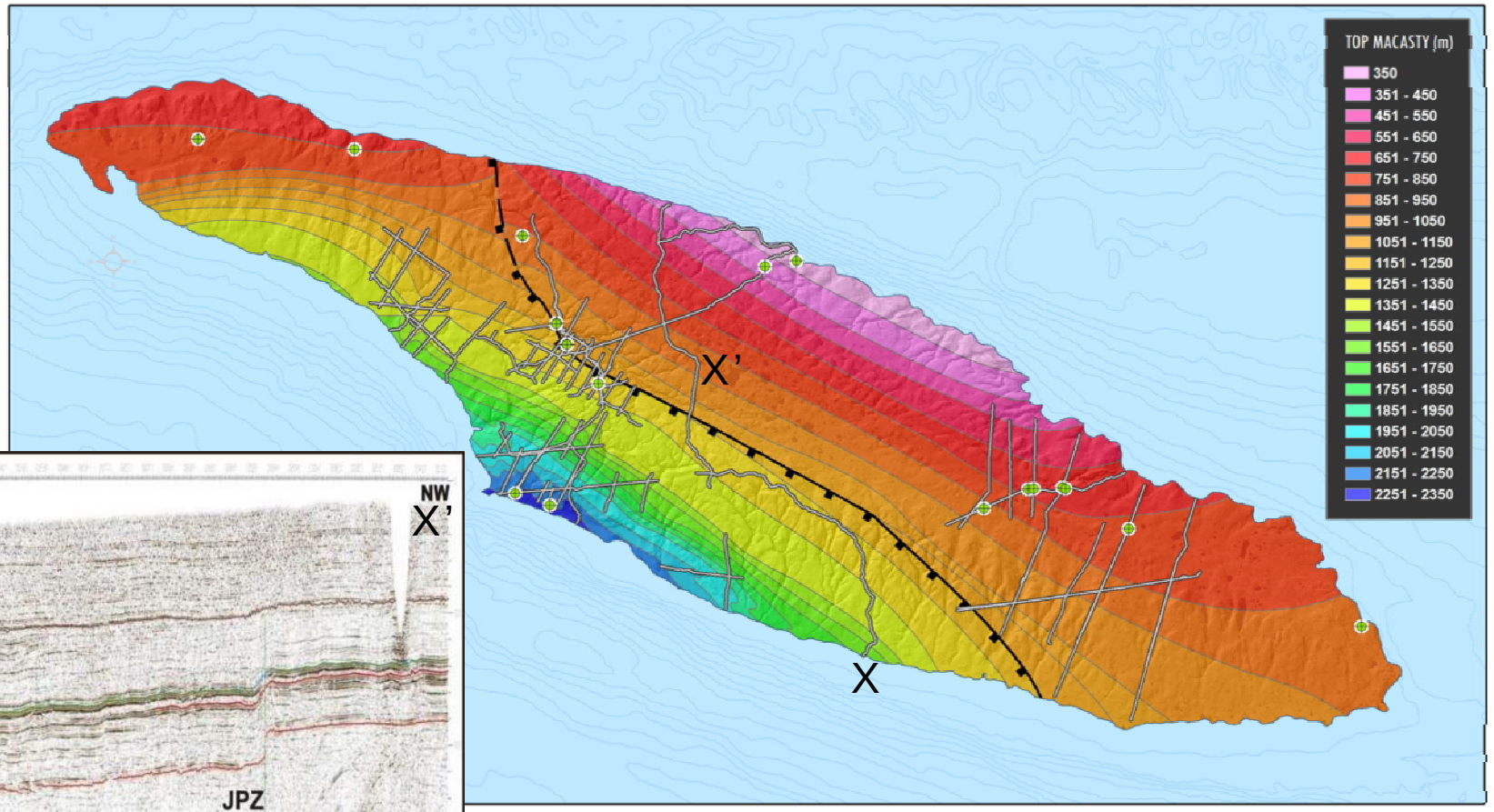
Anticosti Stratigraphy – 4000m of Carbonates

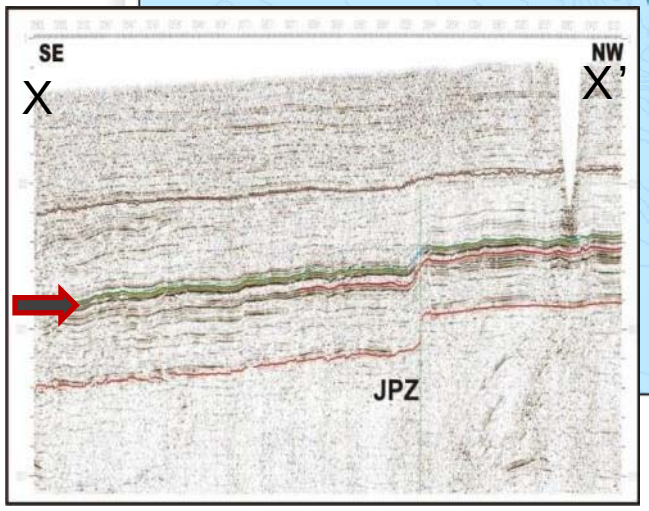




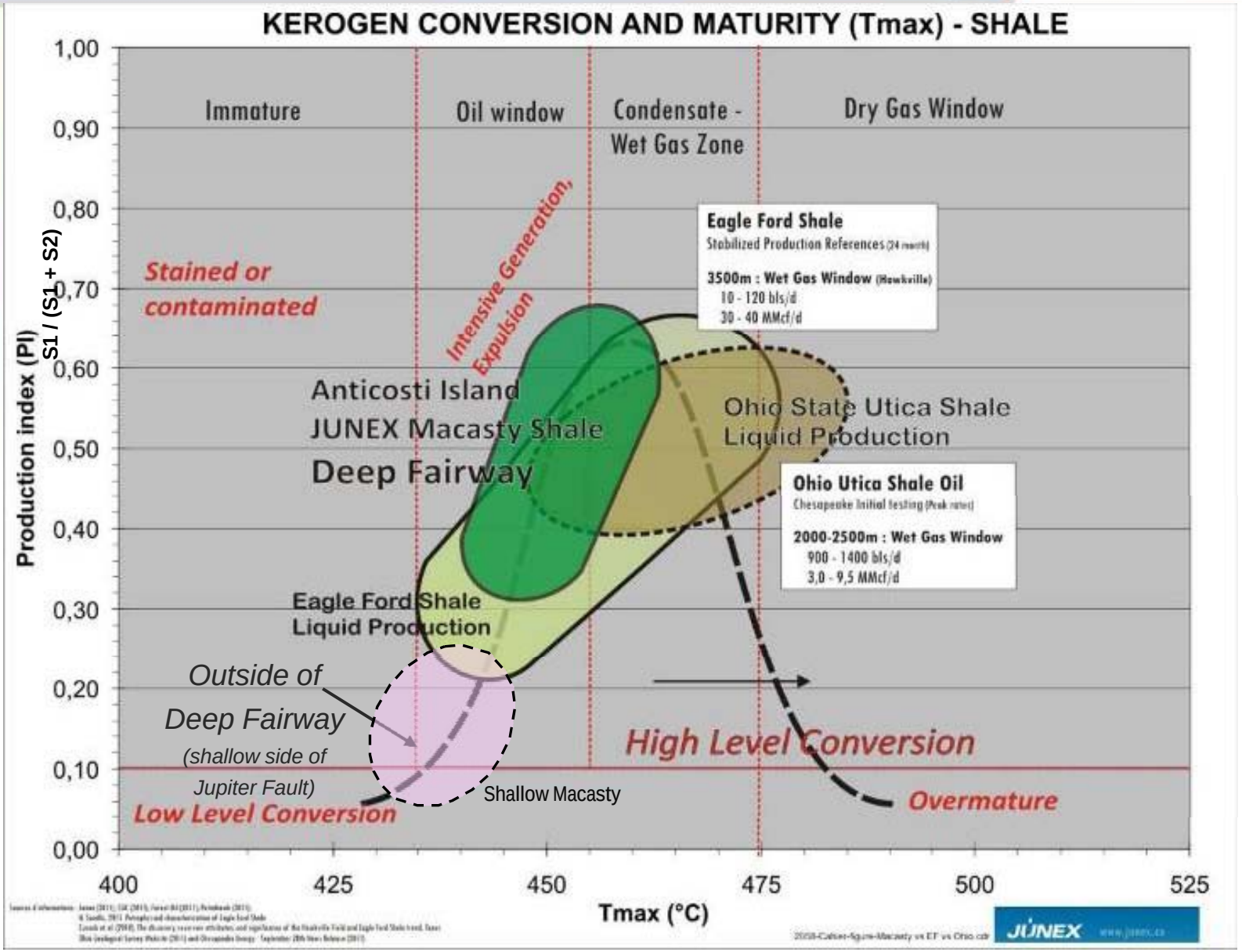
2012 – Deep Fairway Geophysical Survey

- ***225 line-km of 2D seismic survey completed;***
- ***Numerous prospects identified (top 6 to be permitted);***
- ***Position of the Jupiter Fault Zone in the subsurface is better defined***

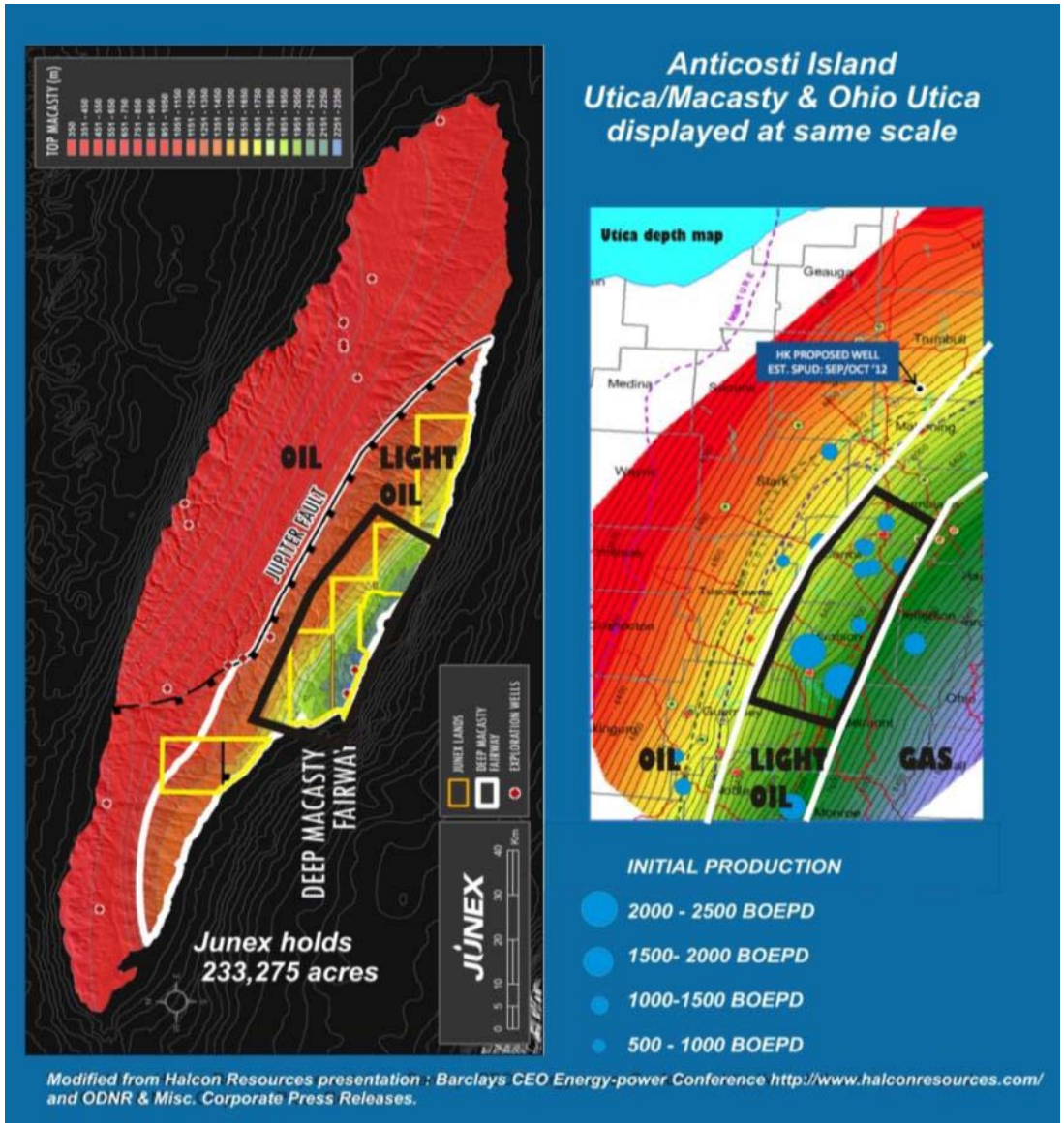




Comparison of Macasty to Utica & Eagle Ford



Fairway comparaison : Ohio vs Anticosti



Modified from Halcon Resources presentation : Barclays CEO Energy-power Conference http://www.halconresources.com/ and ODNR & Misc. Corporate Press Releases.

- ***Both maps are at same scale***
- ***Both are Top Utica Structure Maps***
- ***Both have same contour interval (& color shading)***
- ***Black polygons at same scale on both maps***
- ***Deep Fairway:***
  Higher reservoir pressure = greater reservoir energy
- ***Deep Fairway compares favorably with Ohio Utica light oil belt (sufficient maturity in oil window as defined by geochemistry)***

Conclusion - Quebec's Utica & Macasty Shales

The exploration of Ordovician shales in Quebec is a combination of science, intuition, perseverance and adaptability. But the premises of the story remain similar to those found in other sedimentary basins: the presence of brittle shale which acted as a major source rock.

- Utica Shale Original Gas-in-Place = 330 Tcf
- Macasty Shale Original Oil-in-Place = 46.1 billion BO

The people living in Quebec are energy intensive and more than half of this energy comes from oil and natural gas. The development of oil and gas potential of Québec will generate significant economic benefits for citizens and will have positive impacts on the competitiveness of its sources of supply.