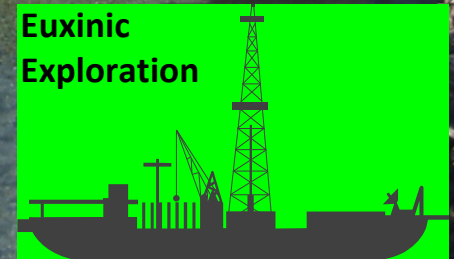


New opportunities for oil exploration in Western Newfoundland offshore: Call For Bids NL13-03 Parcels 1 to 4, Magdalen and Anticosti Basins

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Euxinic Exploration

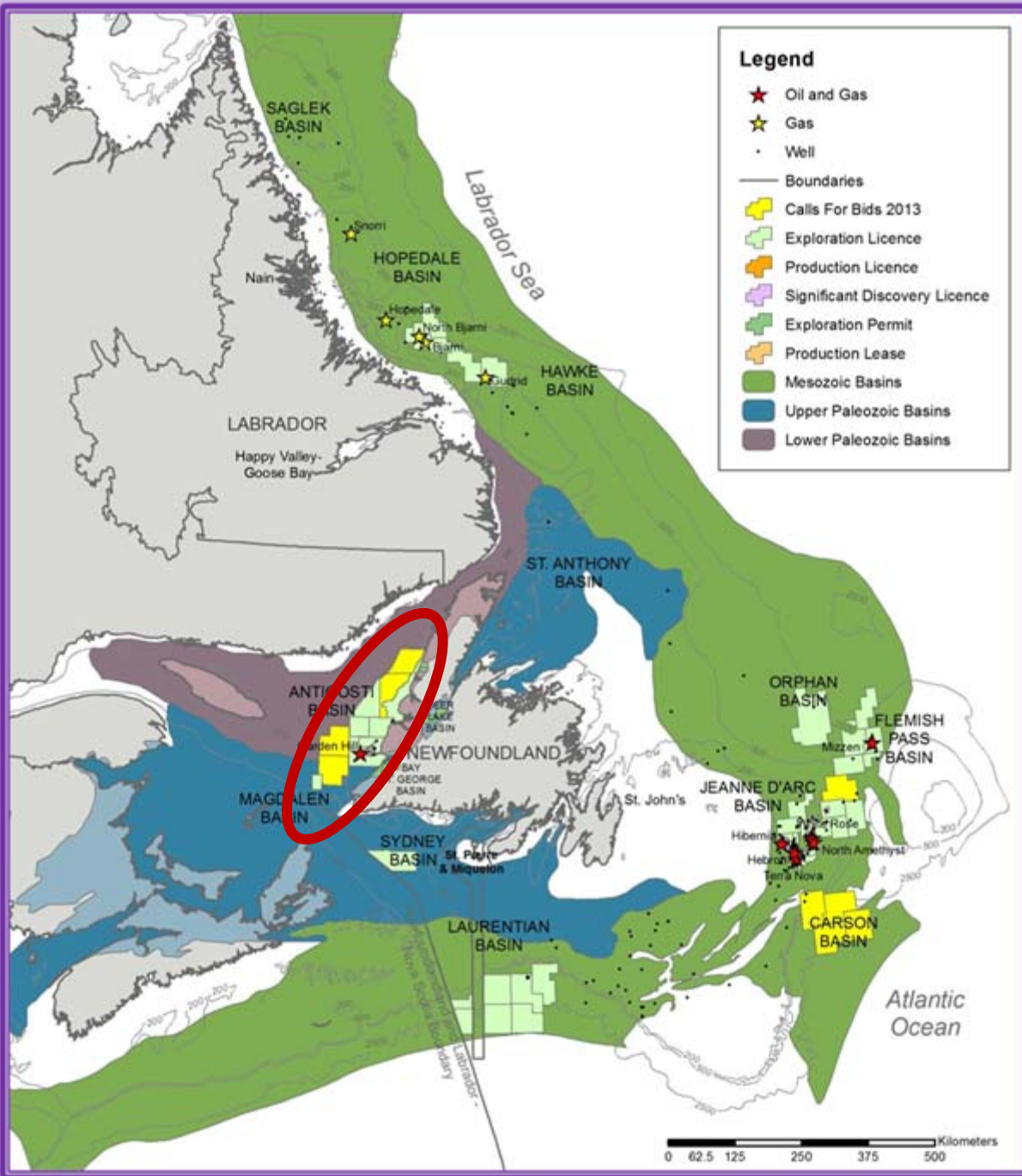


Presentation Content

- 2013 Call for Bids
- Western NL Offshore Land Situation
- Geology Reminder
- Seismic Overview
- NL13-03 Exploration Opportunities
- Discussion
- Conclusions

2013 CFB

- 2013 Call for Bids in three areas:
 - Flemish Pass Basin
 - Carson Basin
 - Western Newfoundland
- Call for Bids NL13-03
Western NL consists of four parcels comprising 1,004,482 hectares (2,482,075 acres) located in the shallow waters of the Gulf of St. Lawrence



Western NL Offshore Land Situation



- 7 active ELs
- Two Paleozoic basins
 - Magdalen
 - Anticosti
- Two Operators
 - Corridor
 - Black Spruce
- All in shallow water less than 400 m
- Discovery (Port au Port #1) was recorded in 1995 and is today part of the Garden Hill South oil field

Modified After C-NLOPB



Geology Reminder

Expanded geological and procedural information can be found at

<http://www.nr.gov.nl.ca/nr/invest/CNLOPB13-03.pdf>

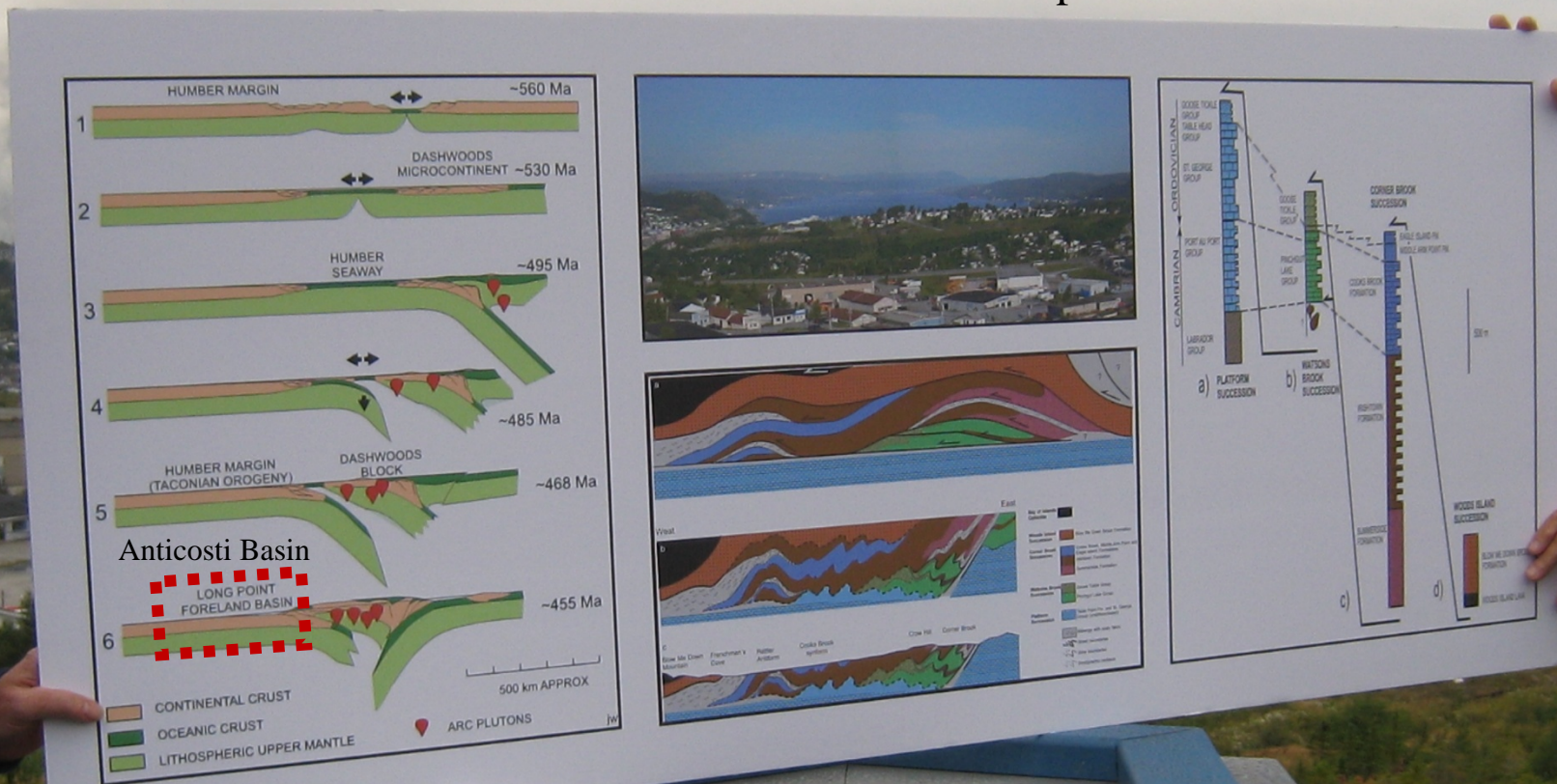
<http://www.nr.gov.nl.ca/nr/invest/enachescuNL11-01anticosti.pdf>

http://www.nr.gov.nl.ca/nr/invest/callforbidsnl09-03_1.pdf

<http://www.nr.gov.nl.ca/nr/invest/callforbidsnl09-03.pdf>

http://www.nr.gov.nl.ca/nr/invest/cfb_nl06_03_anticosti.pdf

- Early Paleozoic Anticosti Basin located in the foreland of the Appalachian Belt
- Late Paleozoic Magdalen Basin is a successor basin overlying the Anticosti Basin
- Both basins located onshore and offshore Western Newfoundland
- The offshore contains least deformed extensional and compressional features



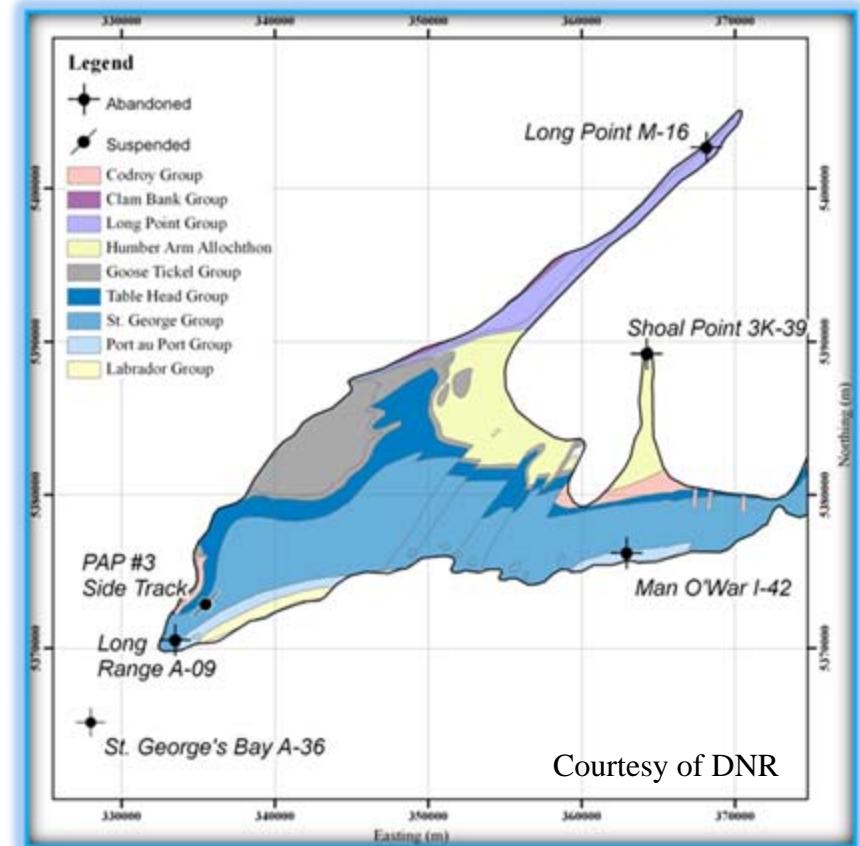
Geology Reminder



- **Area:** Anticosti Basin covers 14,000 km² (~3,500,000 acres) offshore NL; Magdalen Basin has an additional 7,000 km² (~1,700,000) acres. The two basins occupy the entire Gulf of St. Lawrence (25,000 km²)
- **Type:** Paleozoic extensional, transtensional and compressional area developed during the Early-Mid Paleozoic Appalachian Orogeny
 - Anticosti Basin is characterized by the presence of a faulted Carbonate Platform deepening toward the southeast where it is overthrust by Appalachian nappes
 - Magdalen Basin is a younger, successor basin formed as a pull-apart depression and superimposed on the Anticosti Basin
- **Sediments Age:** Cambro-Mid-Ordovician platform with Late Ordovician to Devonian clastics cover in Anticosti Basin in north-central CFB area. Superimposed Late Carboniferous to Permian clastics and marine successions for the Magdalen Basin which underly the southern part of the CFB area

West Newfoundland Offshore Wells

Well No	Well Name	TD (m)	Status
1	Long Point M-16	3810	D&A
2	Long Range A-09	3685	D&A
3	St. George's Bay A-36	3240	D&A
4	Man-O'War I-42	677	D&A
5	Shoal Point K-39	3035	D&A
6	Shoal Point 2K-39	2740	Sidetrack
7	Shoal Point 2K-39Z	36	Shallow
8	Glori E-67	10.6	Location
9	Shoal Point 3K-39	1735	Sidetrack



Yellow = Deep wells; Purple = Shallow well;
 Orange = Location only; Blue = Side track

Location of main offshore and onshore to offshore exploration wells, concentrated around the Port au Port Peninsula.

West Newfoundland Offshore Wells

Exploration Well	Year	Operator	Partners	WD (m)	TD (m)	TD in Form/Gr	Core	DST	Observation
Long Point M-16	1996	Hunt	PanCanadian	0	3810	Berry Head	yes		D&A onshore to offshore well
Long Range A-09	1996	Talisman	CanOxi, Oilexco, Vinland	0	3685	Watts Bight			D&A onshore to offshore well
St. George's Bay A-36	1996	Hunt		83.8	3240	Forteau	yes		D&A, true offshore well
Man-O'War I-42	1998	Inglewood		0	677	Forteau			Shallow well cored
Shoal Point K-39	1999	PanCanadian		0	3035	Hawke Bay		yes	D&A onshore to offshore well
Shoal Point 2K-39	2008	Shoal Point	PDI, CIVC	0	2740	Table Head			Abandoned, onshore to offshore
Shoal Point 2K-39Z	2008	Shoal Point	PDI, Shoal Point Energy	0	36	N/A			Shallow Abandoned
Glori E-67	2008	Tekoil	Ptarmigan	0	10.6	N/A			Location only
Shoal Point 3K-39	2011	Dragon Lace	CIVC., Shoal Point	0	1194	Green Point			Abandoned
Shoal Point 3K-39Z	2012	Dragon Lace	CIVC, Shoal Point	0	1168				Suspended

Yellow = 4 deep wells; Purple = 1 Shallow well; Orange = 2 Location only; Blue = 3 Side track; N/A = Not applicable
Only 4 Wells are deep and significant for correlating the offshore geology; Only St. George A-36 was a true offshore well

Newfoundland Geology Map and Significant Petroleum Shows

PAP = Port au Port #1 Oil Discovery

SP = Shoal Point oil detected in Green Point shales

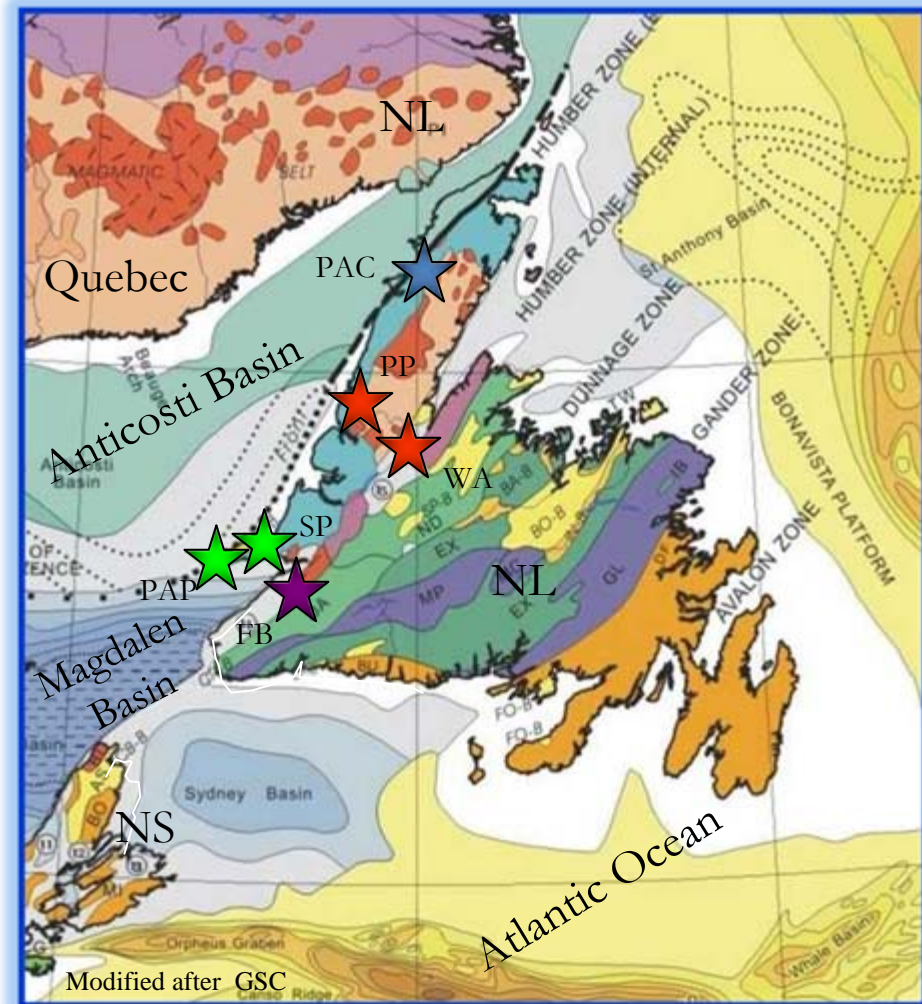
FB = Flat Bay wells that intersected tight oil zone

WA = West Adventure #1 limited gas flow

PAC = Port au Choix exhumed oil field

PP = Nalcor's Parsons Pond wells with gas shows

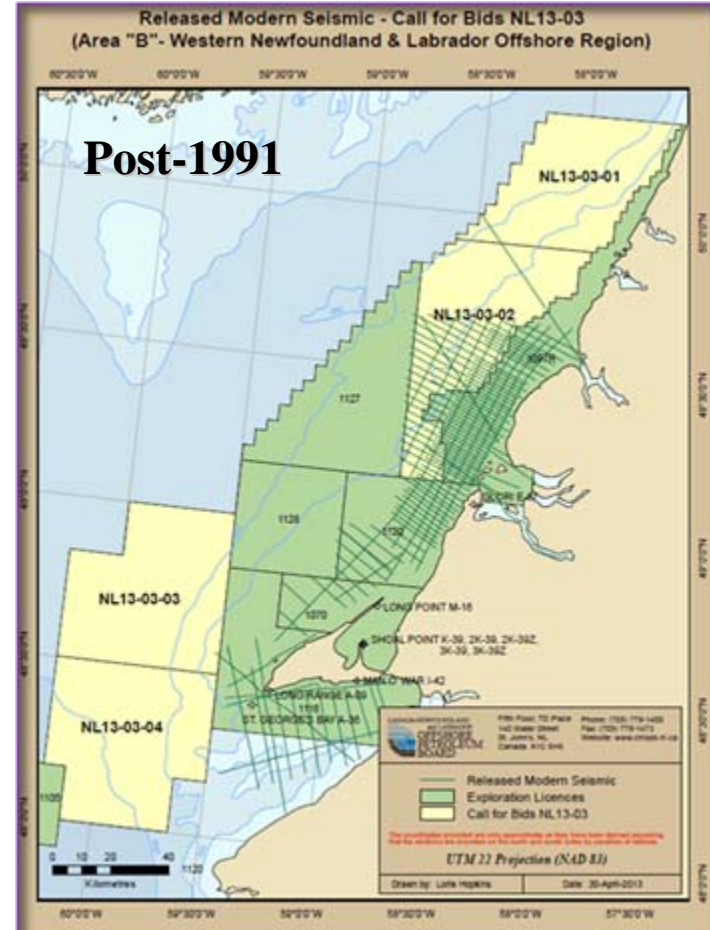
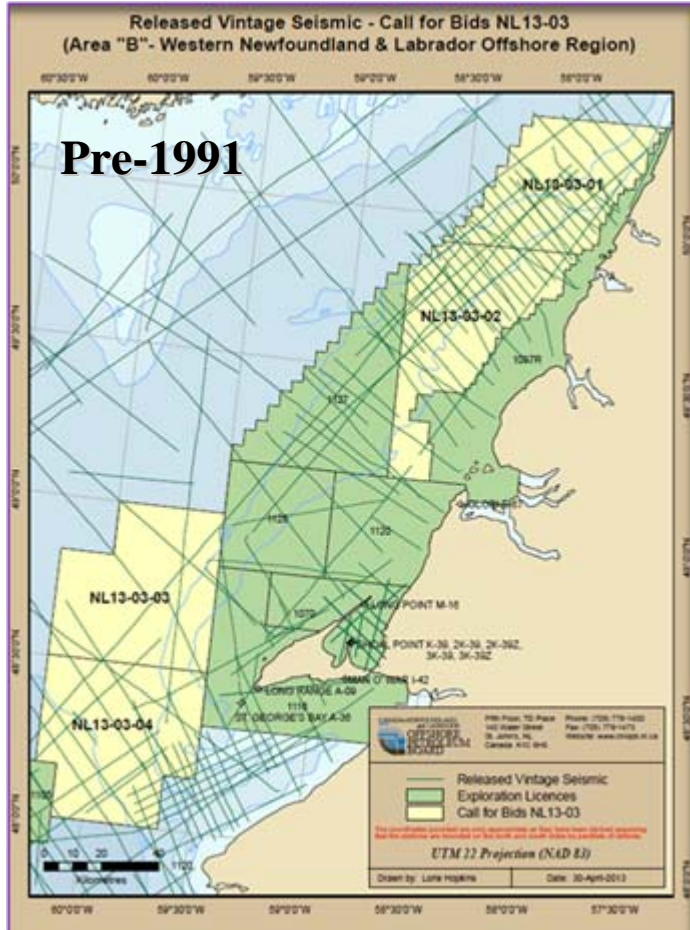
More than 20 years of effort





Seismic Coverage

Pre and Post-1991 Seismic Coverage



Except for the BHP program collected in 1990, data was recorded with short streamers, is poor imaging and unmigrated

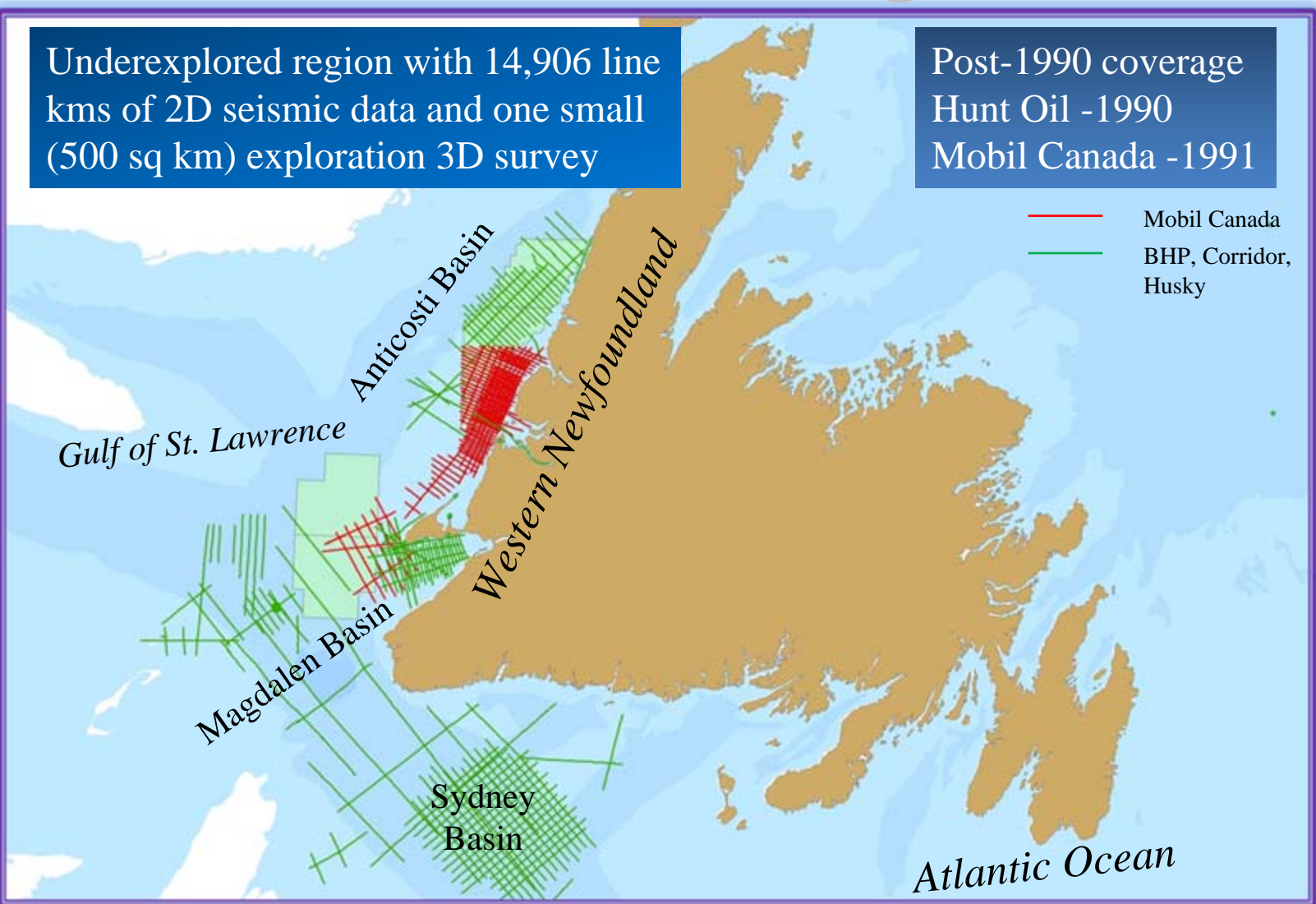
Recorded with longer streamer, better imaging and migrated
 No recent coverage for parcels 1, 3 and 4

Offshore Western Newfoundland Seismic Coverage

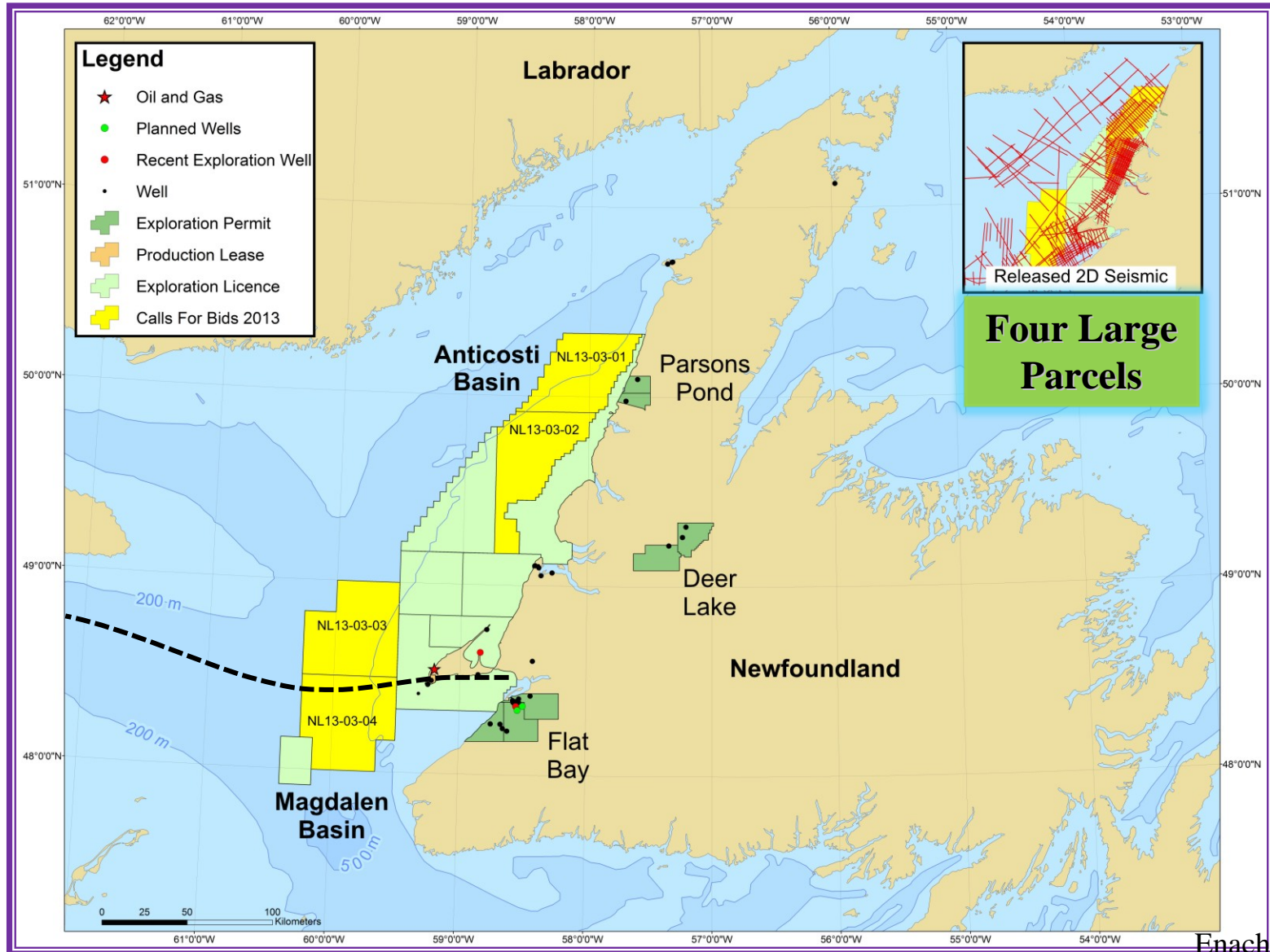
Underexplored region with 14,906 line kms of 2D seismic data and one small (500 sq km) exploration 3D survey

Post-1990 coverage
Hunt Oil -1990
Mobil Canada -1991

— Mobil Canada
— BHP, Corridor, Husky



NL13-03 Exploration Opportunities

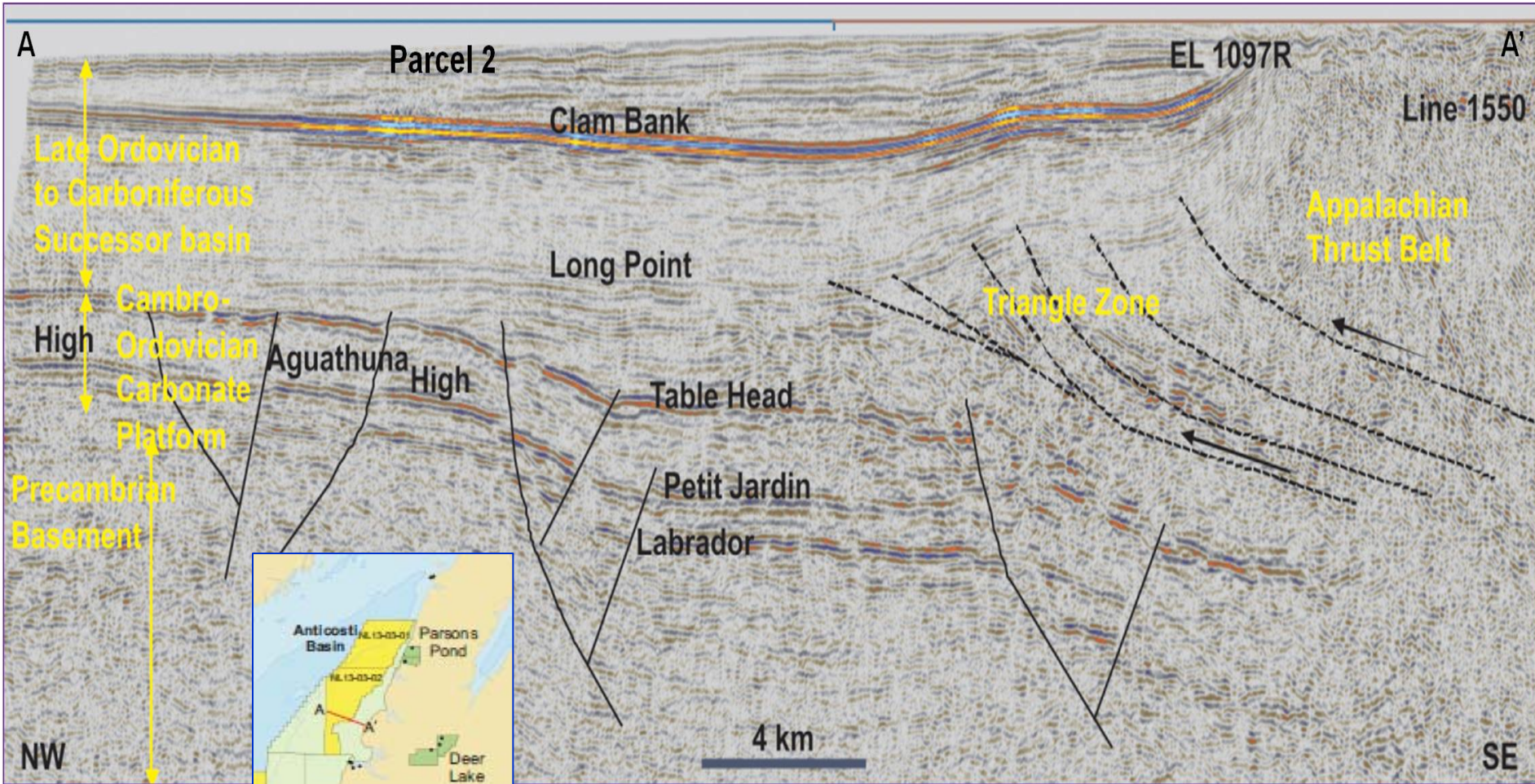


NL13-03 Exploration Opportunities

Parcel	Basin	Area ha	Area Acres	GOM tracts
1	Anticosti	215,254	531,893	92.3
2	Anticosti	241,788	597,458	103.7
3	Antic/Magd	272,510	673,372	116.9
4	Magdalen	274,930	679,352	117.9

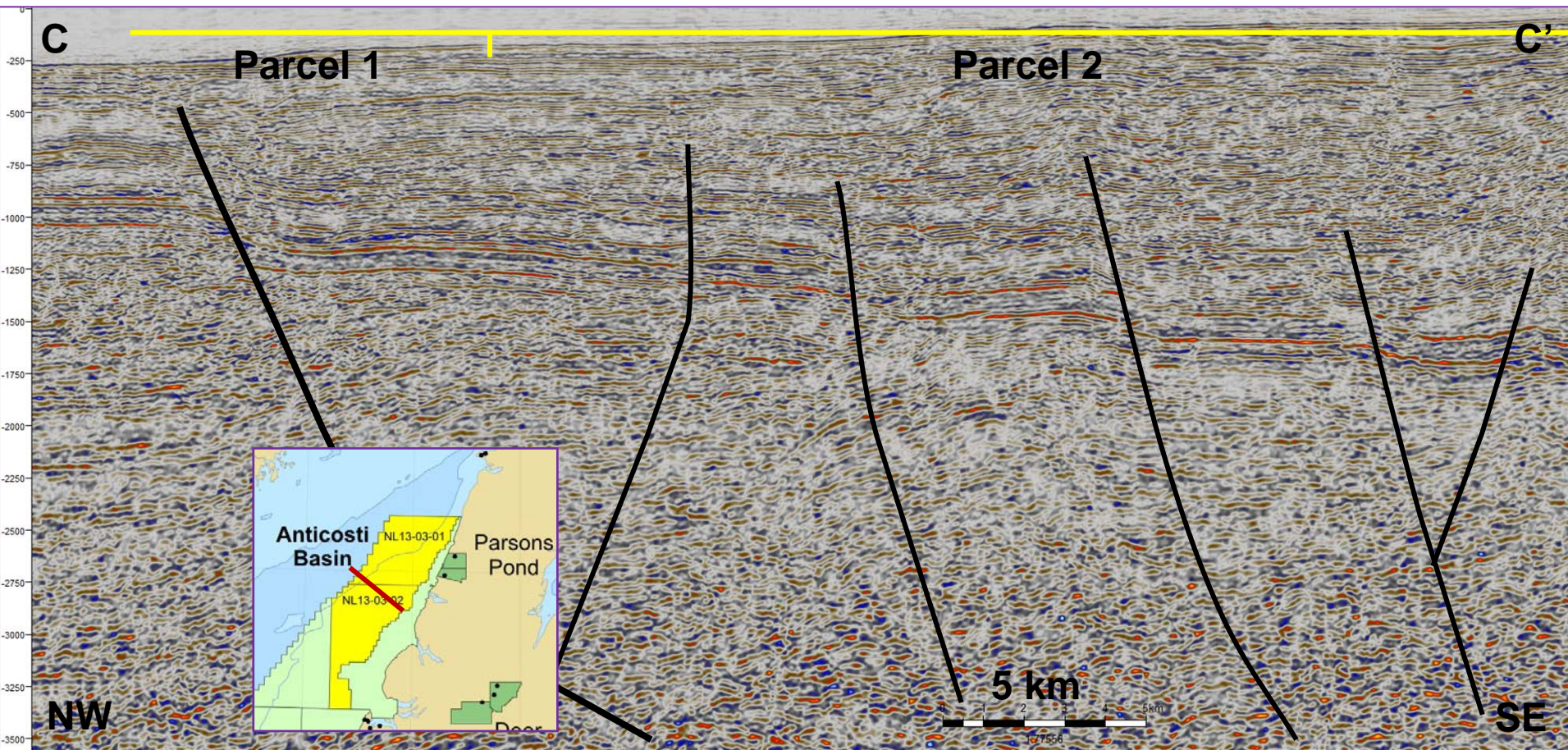
- Call for Bids issued May 2013
- Parcels approx 100 times larger than GOM tract
- Shelfal Drilling. Water Depth ranging from 90 to 330 m
- Minimum Work Commitment Bid \$250,000 CAD
- **Closing date to be published on C-NLOPB website under “What’s New!”**

Anticosti Basin Representative Line Parcel 2



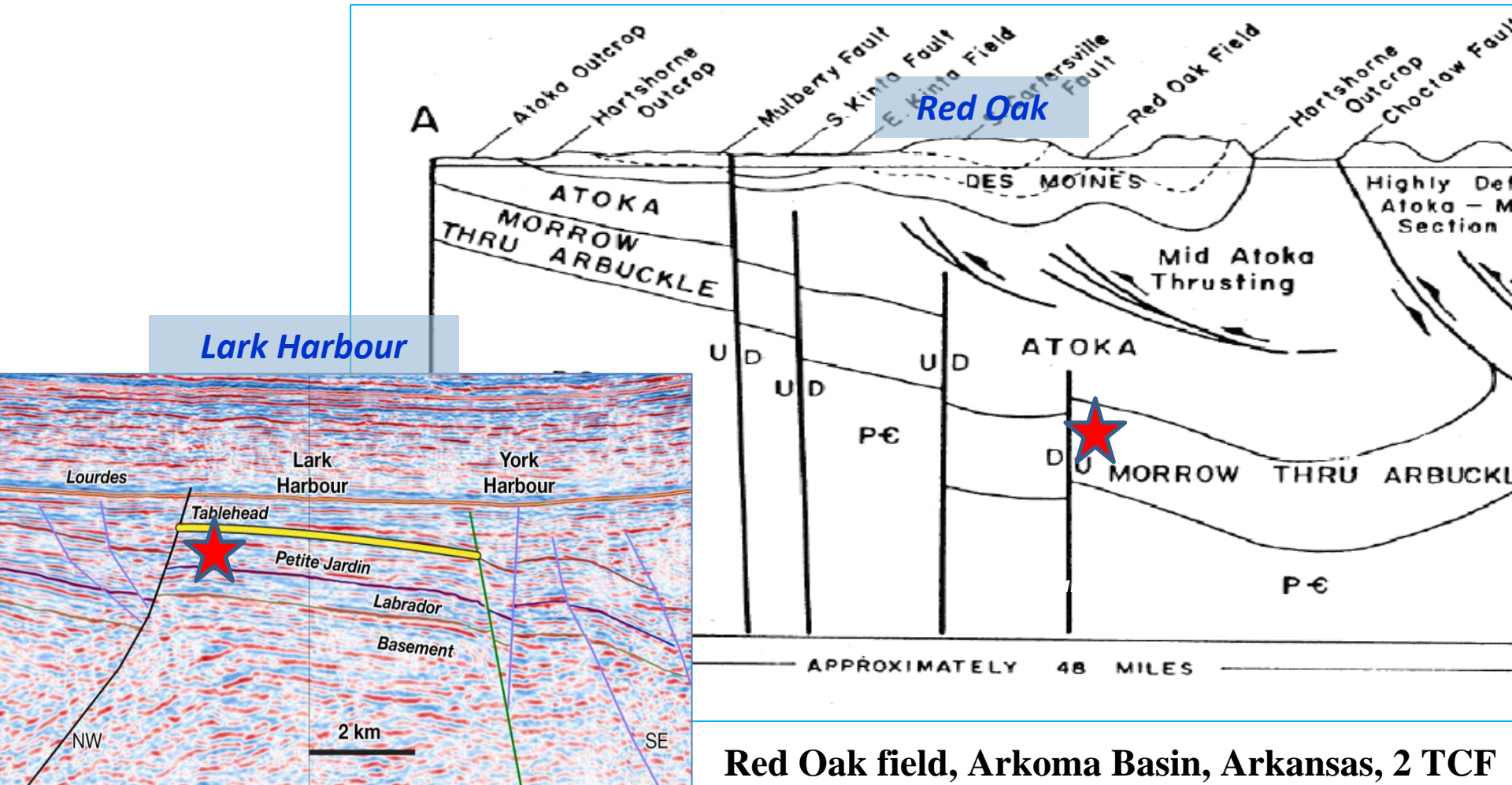
Line source: C-NLOPB

Anticosti Basin Representative Line Parcel 1



Line source: C-NLOPB

Look-alike with Fields in Appalachian Belt and Foredeep and EL 1120

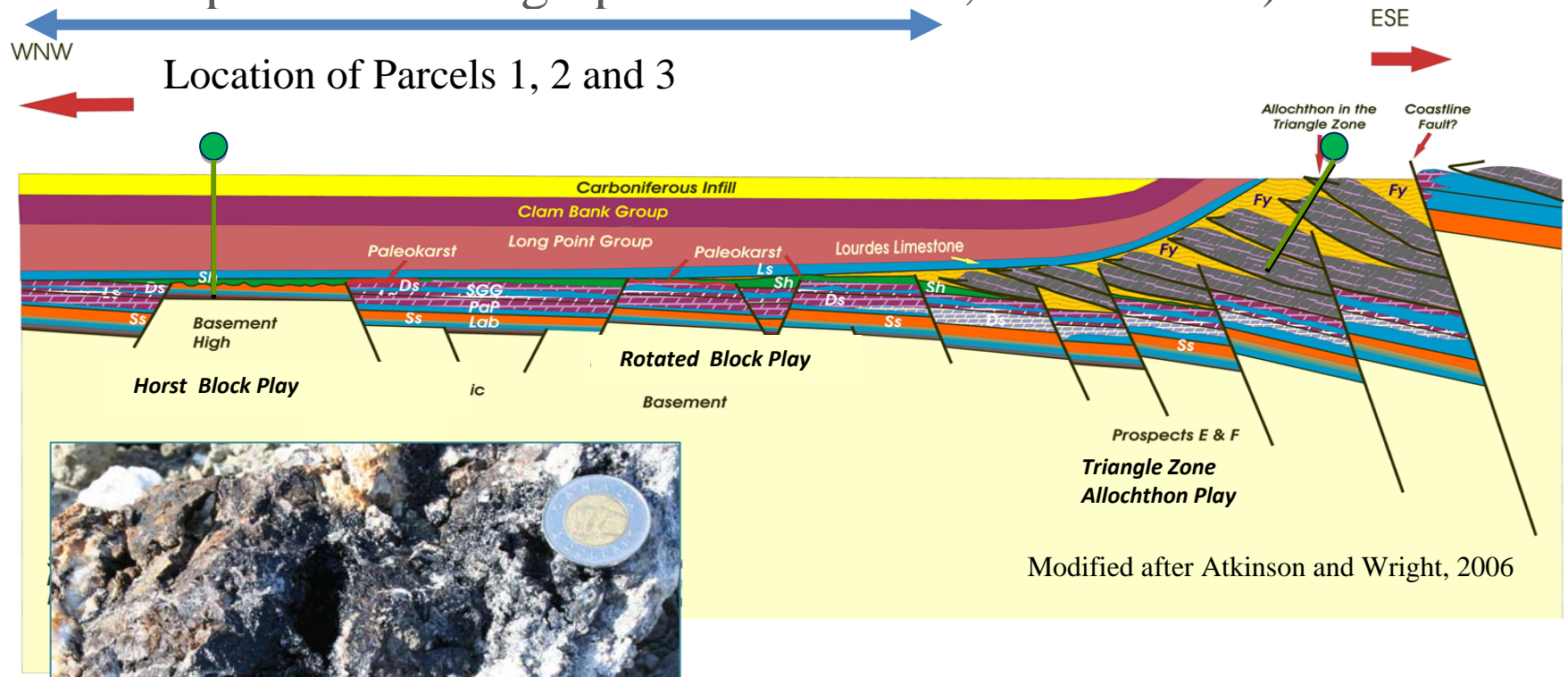


Red Oak field, Arkoma Basin, Arkansas, 2 TCF

EL 1120, W NL offshore

Geological Cross-Section Anticosti Basin

- Offshore play is structurally simple in all parcels
- Carbonate platform and sandstone reservoirs in rotated blocks
- Also possible stratigraphic traps (karst, HDT lenses)

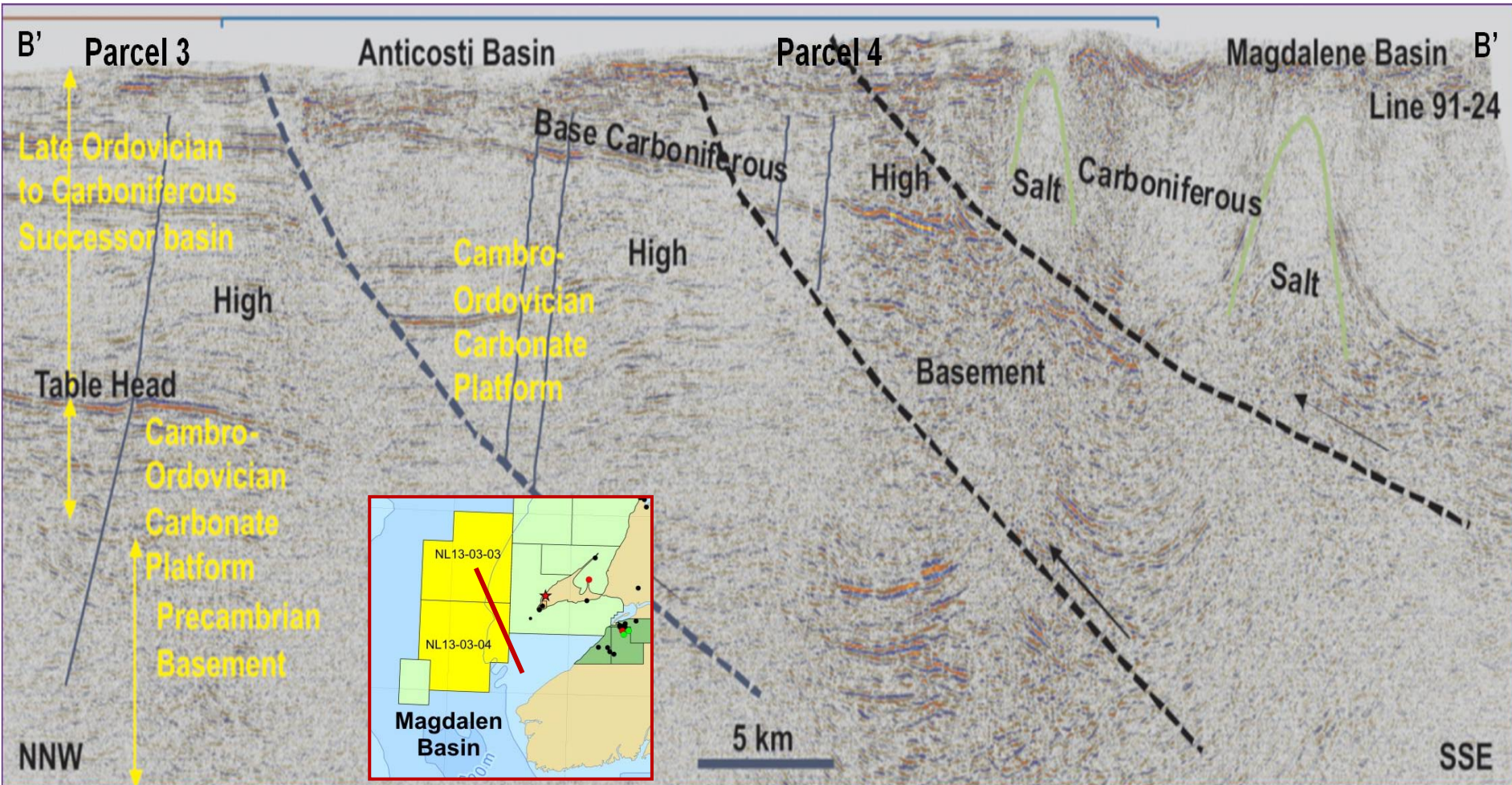


Carbonate reservoir-outcrop

Anticosti Basin Play Types

- Cambro-Ordovician Carbonate Platform horsts and rotated fault blocks containing hydrothermal dolomite and karsted limestone reservoirs of the St. George Group are the main play types in Anticosti Basin
- Limestones of Port au Port and sandstone of Labrador Group trapped in rotated fault blocks forms a secondary play type
- Hydrocarbon traps are multi-fault bounded, 25 to over 100 km² (~ 6,200 to 25,000 acres) in size

Magdalen Basin Representative Line Parcels 3 and 4

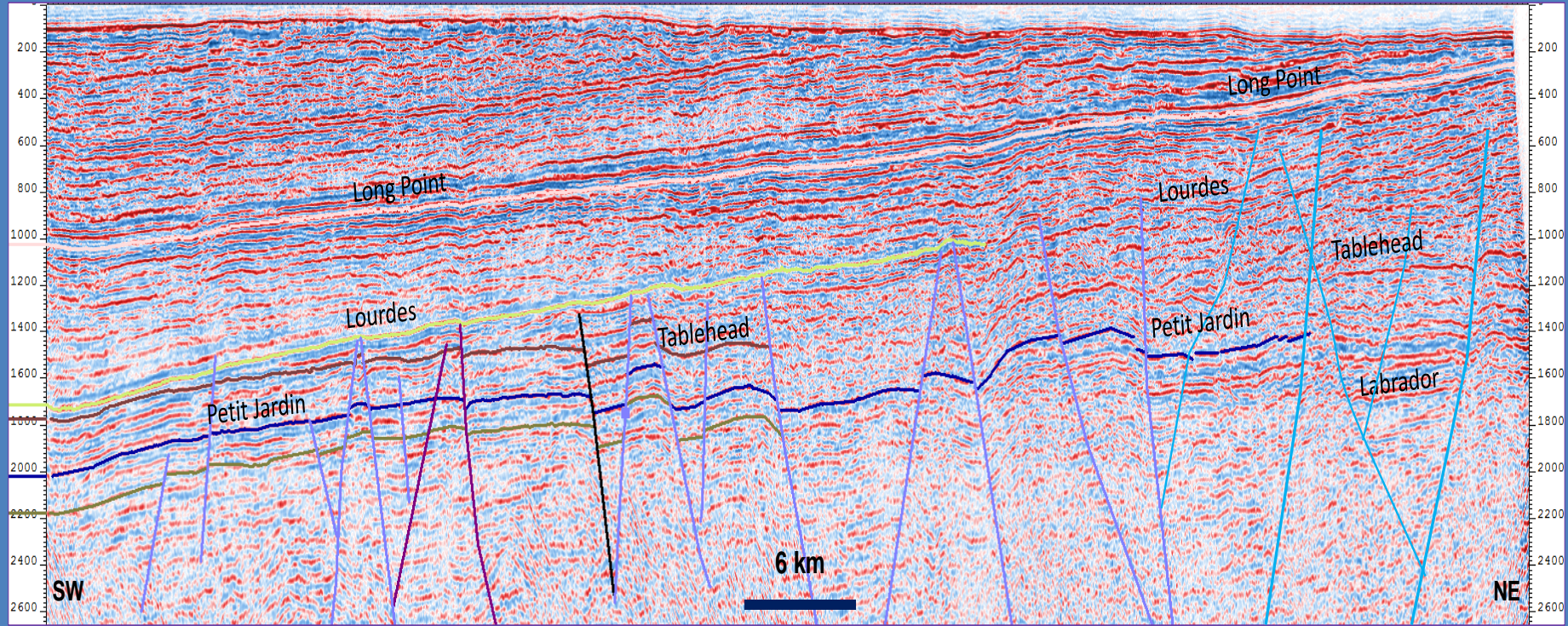


Line source: C-NLOPB

Magdalen Basin Play Types

- Main play types are thrust fault anticlines and salt anticlines containing Carboniferous sandstone trapped against and above salt diapirs
- Deeper play involves Carbonate Platform reservoirs in inverted or extensional structures
- Superimposed reservoirs are possible
- Large compressional and salt anticline, and deeper extensional traps are 25 to over 100 km² in size

Strike Line Along the W NL Offshore



Line source: Ptarmigan

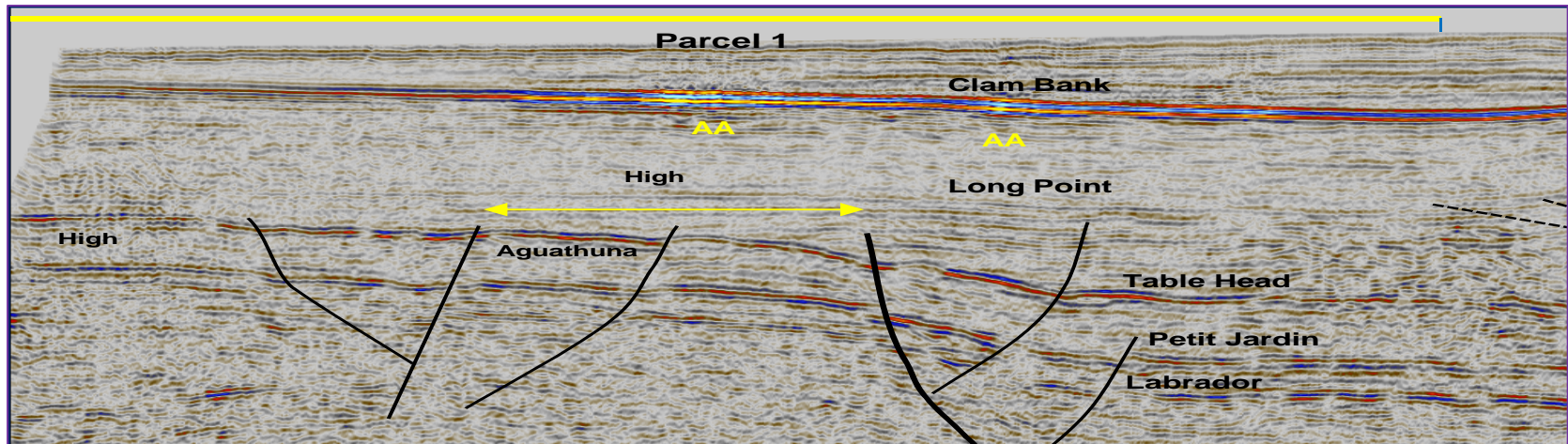
Numerous tilted blocks, horsts, roll-over and slightly inverted structures are interpreted in the Carbonate Platform sequence on a strike line along the Western NL Anticosti Basin

Discussion

- **Last significant well drilled in 1999**
- **Last 2D Regional seismic program in 1991**
- **Active petroleum systems proven in both Anticosti and Magdalen basins, but still underexplored frontier areas**
- **Area needs a revival of activities and infusion of new operators with financial capability to carry a complete exploration program to fruition**
- **The C-NLOPB 2013 Western Newfoundland Call for Bids provides an occasion for sizeable operators to obtain large frontier acreage near oil markets**

Conclusions

- Four large parcels in Paleozoic Anticosti and Magdalen basins offered at NL13-03 CFB
- Proven petroleum systems with both oil and gas source rocks
- Large structural traps as big as 100 km²
- Structures capable of holding hundreds of mmbbls or 2-3 Tcf
- Excellent opportunity for new entrants in NL O&G exploration



Line source: C-NLOPB

Thank You for Attention!

Acknowledgements

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Pictures From

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