

Focus on Oil & Gas Northwest Territories

Calgary, June 7, 2004

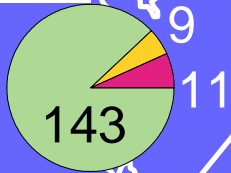
**Comparative analysis of ultimate
natural gas resource potential -
Louisiana Gulf Coast, Mackenzie
Delta/Beaufort and Scotian Shelf
Basins**

G. E. Reinson and K. J. Drummond

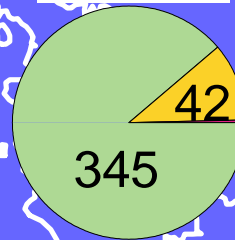
NORTH AMERICA CONVENTIONAL NATURAL GAS RESOURCE BASE

(December 31, 2002)

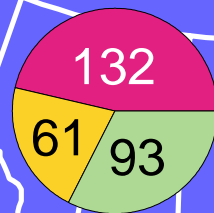
163 TCF



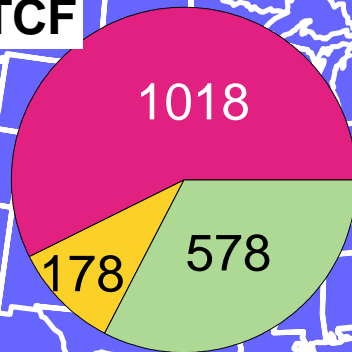
389 TCF



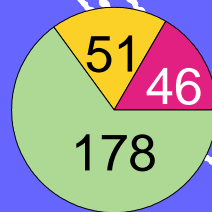
286 TCF






1774 TCF



275 TCF



	CUM PRODUCTION 1209 TCF
	REMAINING 341 TCF
	UNDISCOVERED 1337 TCF
TOTAL INIT RESOURCE 2887 TCF	

OBJECTIVES

- To examine future conventional gas demand in North America relative to traditional gas supply
- To compare the prolific gas producing Louisiana Gulf Coast Deltaic Province with frontier delta regions of Canada
- To validate whether analogies can even be made between the Gulf Coast and Canada's frontier areas with respect to future sustainable gas supply

ULTIMATE RESOURCES (TOTAL)	DISCOVERED RESOURCES	RESERVES	CUMULATIVE PRODUCTION
			REMAINING RESERVES
		DISCOVERED RESOURCES	
	UNDISCOVERED RESOURCES		

CANADA AND LOWER 48 USA REMAINING GAS RESOURCE (TCF)

Western Canada Sedimentary Basin	153.3
Beaufort Sea /Mackenzie Delta	58.9
Scotian Shelf	18.2
Other Canada	55.7

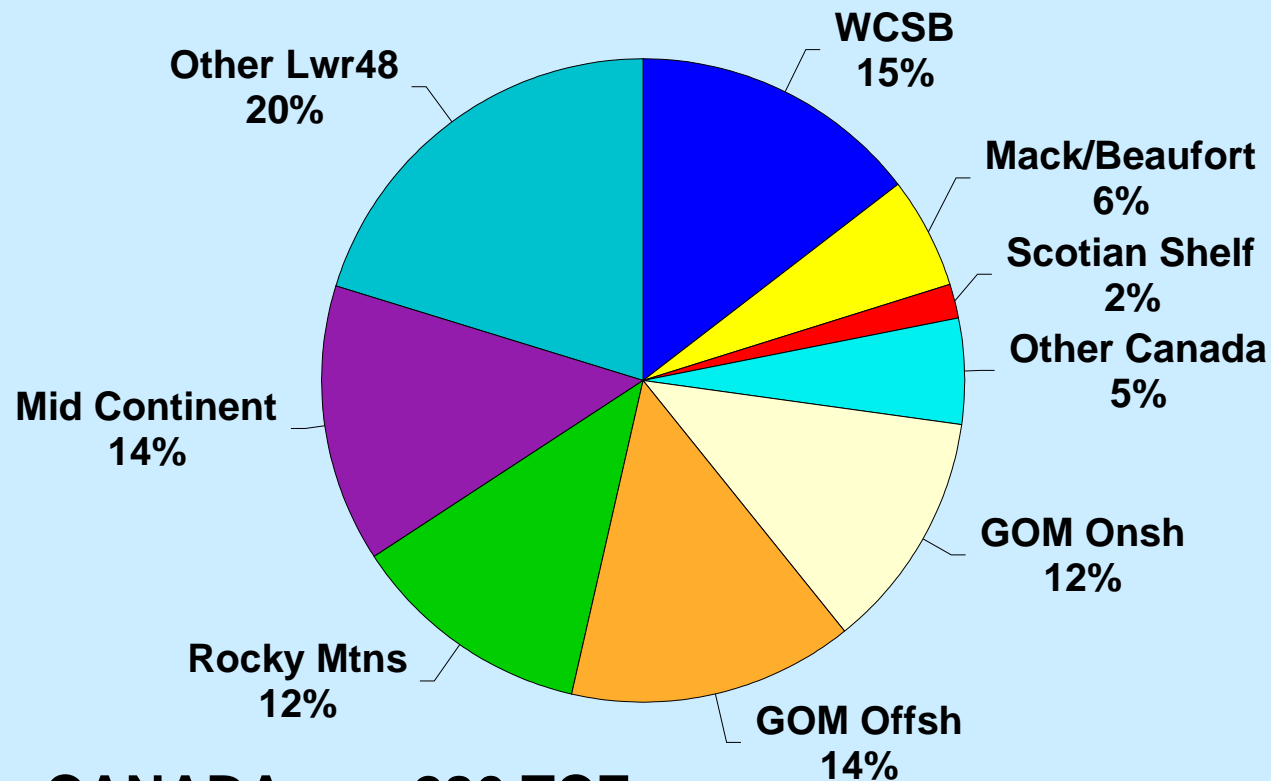
TOTAL CANADA 286.1

Gulf of Mexico Onshore	126.3
Gulf of Mexico Offshore	151.0
Rocky Mountains	128.2
Mid-Continent	147.1
Other Lower 48 USA	212.8

TOTAL LOWER 48 USA 765.9

TOTAL CANADA - LOWER 48 USA 1,052.0

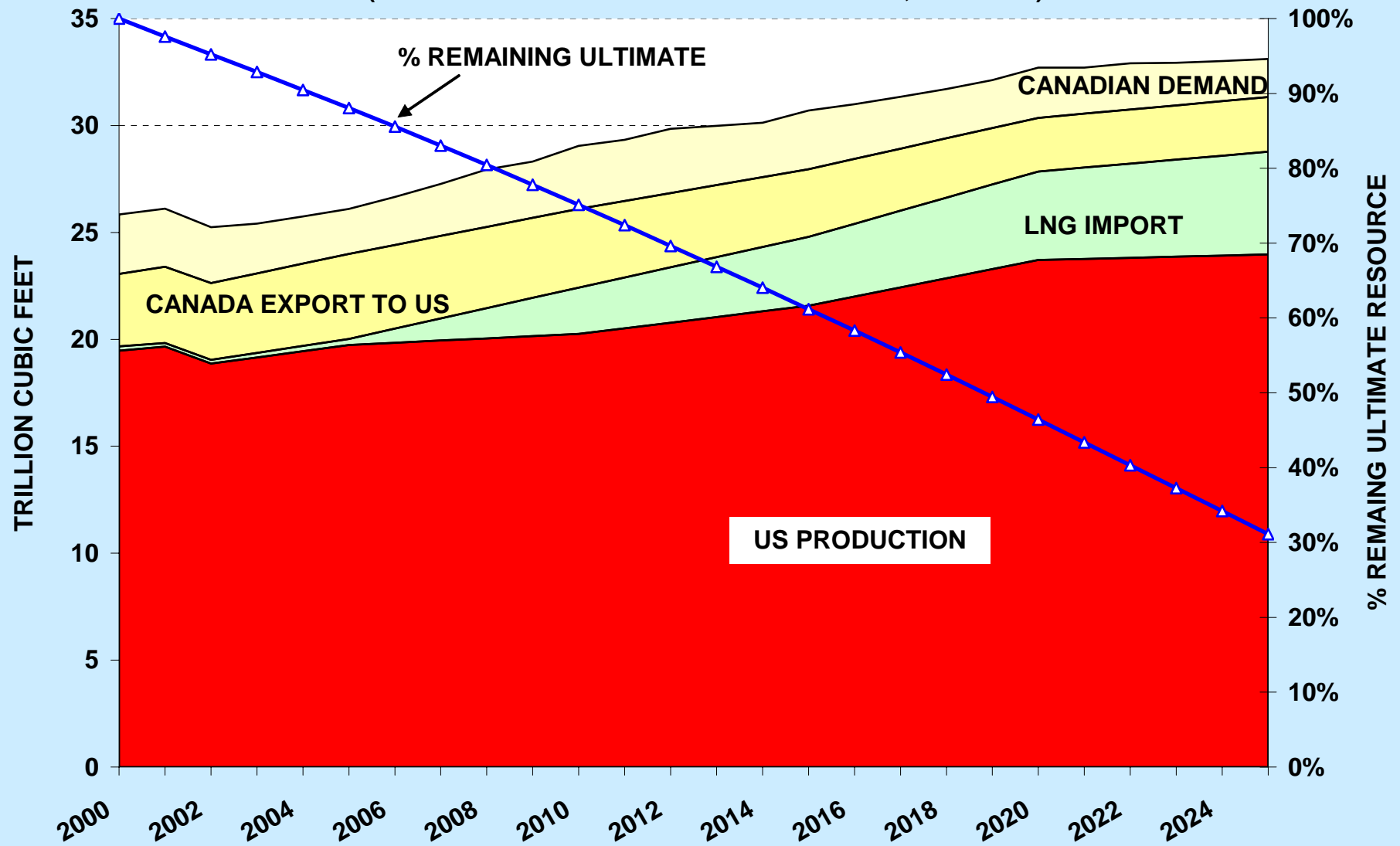
CANADA AND US LOWER 48 REMAINING AVAILABLE GAS RESOURCE



CANADA - 286 TCF
US LWR 48 - 766 TCF
TOTAL - 1052 TCF

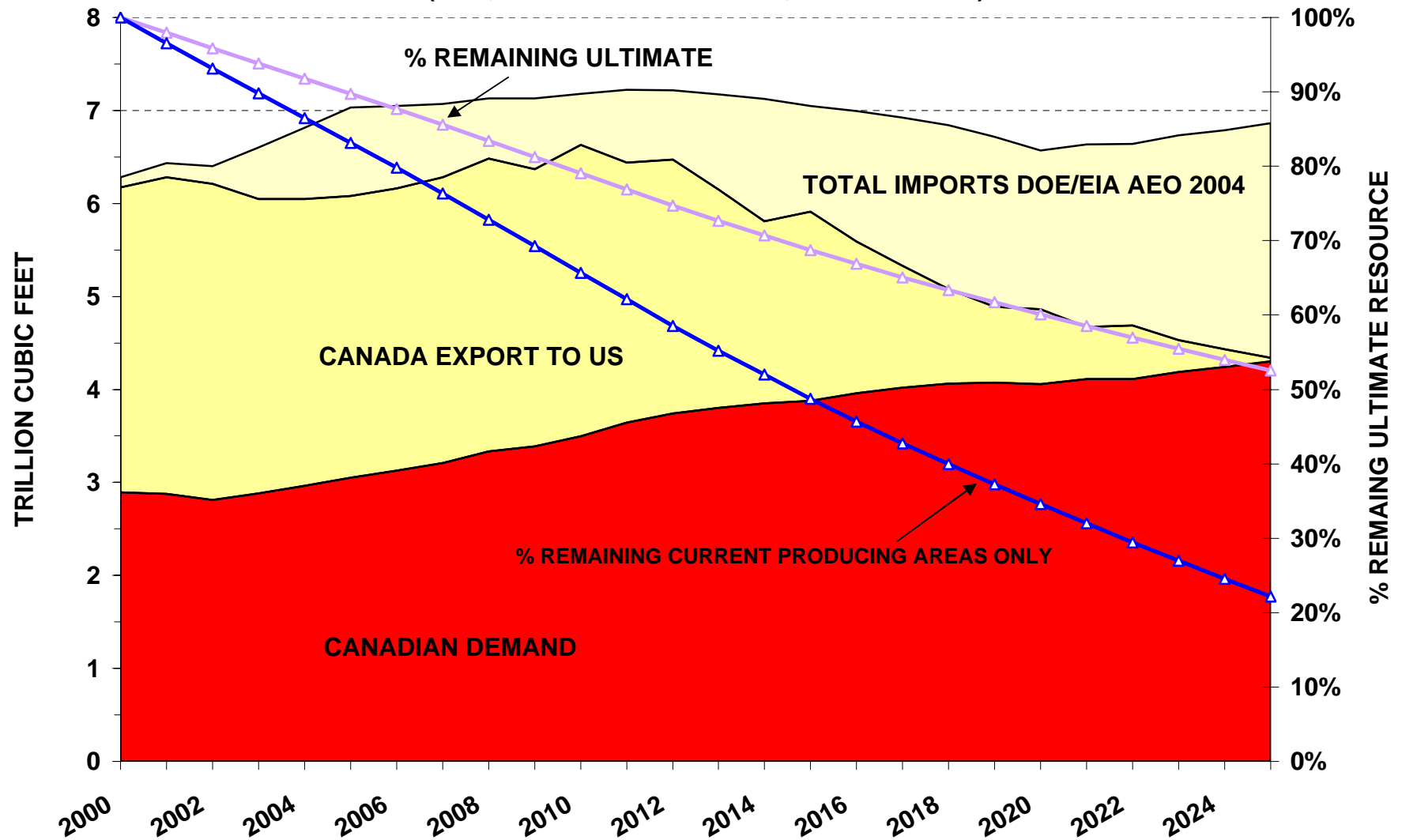
USA/CANADA NATURAL GAS SUPPLY

(DOE/EIA ANNUAL ENERGY OUTLOOK 2004, NEB 2003)

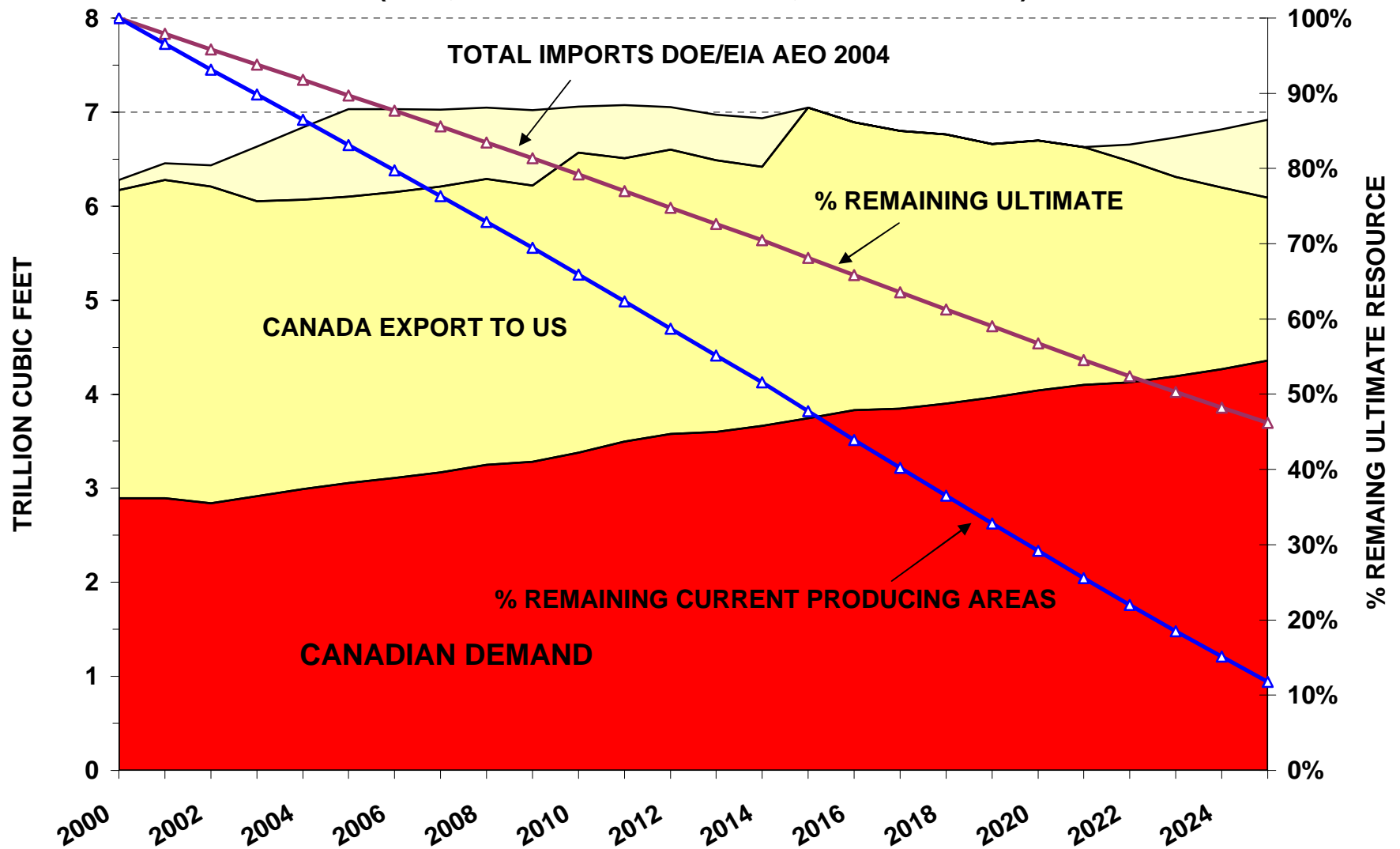


CANADA NATURAL GAS SUPPLY

(NEB, 2003 SUPPLY DEMAND, SUPPLY PUSH)

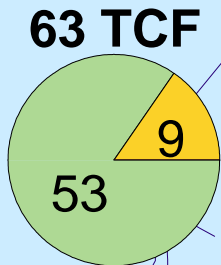


**CANADA NATURAL GAS SUPPLY
(NEB, 2003 SUPPLY DEMAND, TECHNO-VERT)**

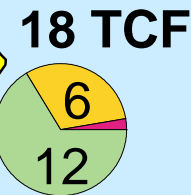


CONVENTIONAL NATURAL GAS RESOURCE BASE IN THE 3 DELTA AREAS

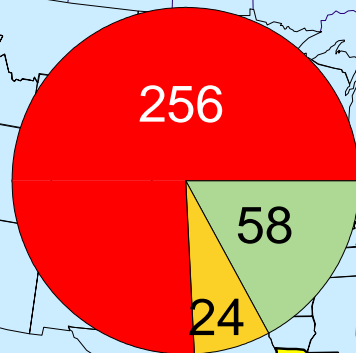
**BEAUFORT
MACKENZIE
BASIN**



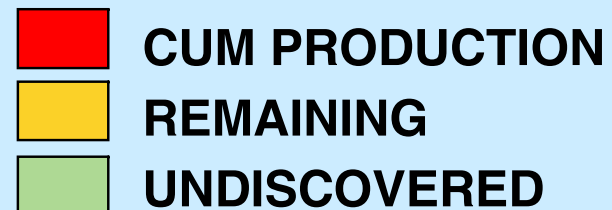
**SCOTIAN
BASIN**



338 TCF



**LOUISIANA
GULF COAST
BASIN**



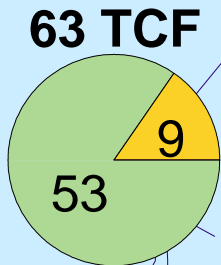
RECOVERABLE GAS RESOURCES (TCF)

December 31, 2002

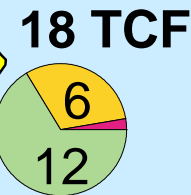
	<u>CUM PROD</u>	<u>REM RSV</u>	<u>DISCOV RES'RCE</u>	<u>UNDISC RES'RCE</u>	<u>ULT RES'RCE</u>
LOUISIANA	256.3	24.0	0.0	57.7	338.0
BEAU/MACK	0.0	0.0	9.0	53.3	62.3
SCOTIAN	0.5	2.5	3.8	11.4	18.2
TOTAL	256.8	26.5	12.8	122.4	418.5

CONVENTIONAL NATURAL GAS RESOURCE BASE IN THE 3 DELTA AREAS

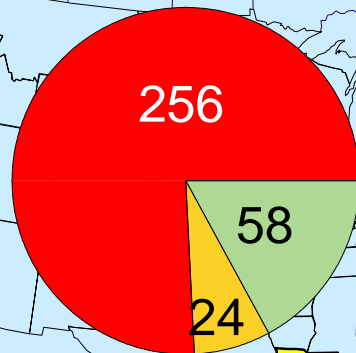
**BEAUFORT
MACKENZIE
BASIN**



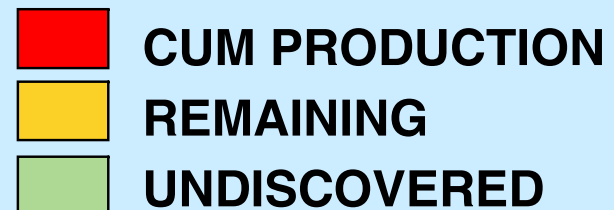
**SCOTIAN
BASIN**



338 TCF



**LOUISIANA
GULF COAST
BASIN**



**BEAUFORT/
MACKENZIE
BASIN**

**46,651 mi²
(120,826 km²)**

**29,857,000 acres
(12,083,000 ha)**

**LOUISIANA
GULF COAST
BASIN**

**66,697 mi²
(172,745 km²)**

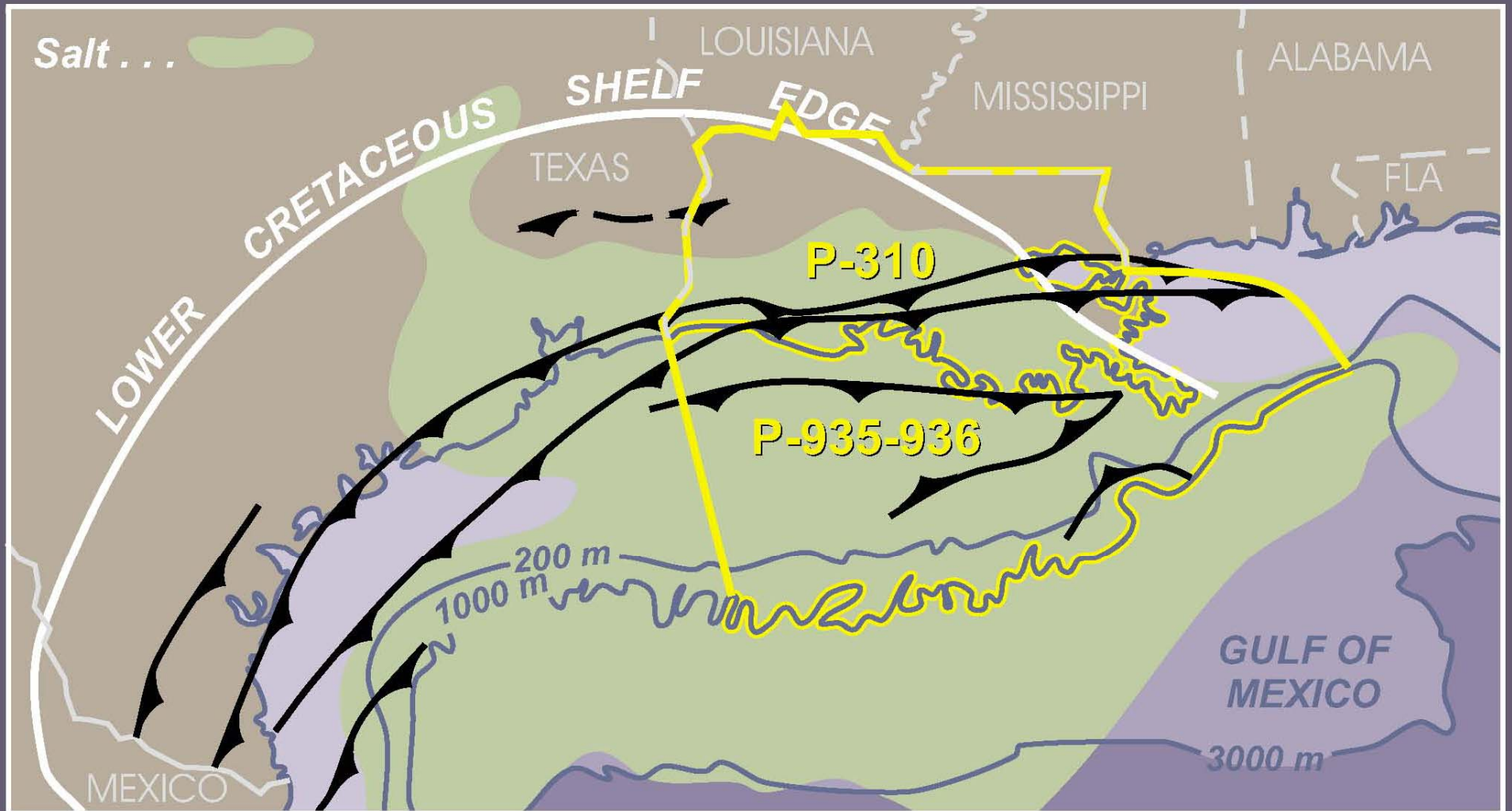
**42,686,000 acres
(17,274,000 ha)**

**SCOTIAN
BASIN**

**101,413 mi²
(262,657 km²)**

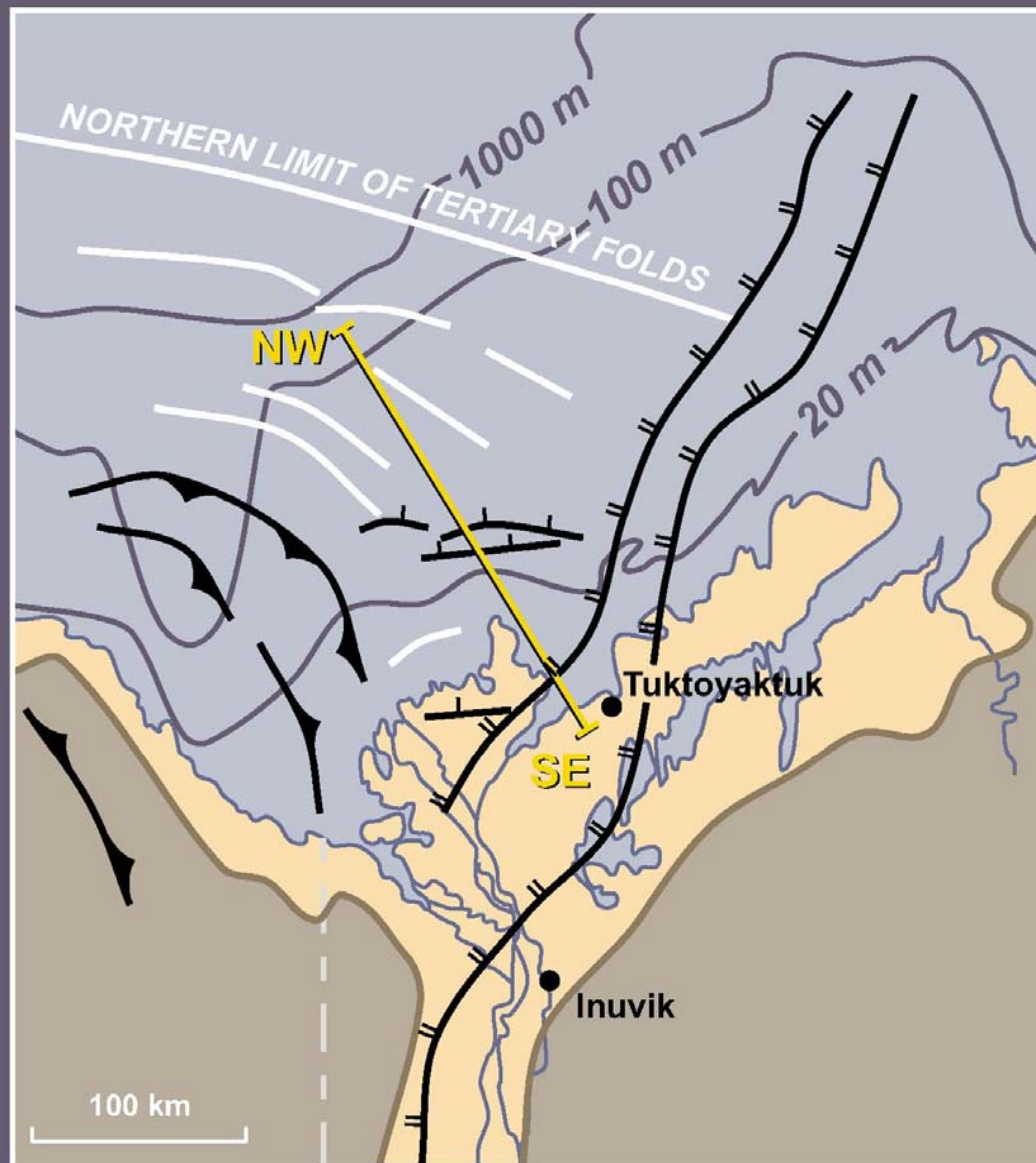
**64,904,000 acres
(26,266,000 ha)**

LOUISIANA GULF COAST BASIN



from PGC, 1999

BEAUFORT SEA/ MACKENZIE DELTA

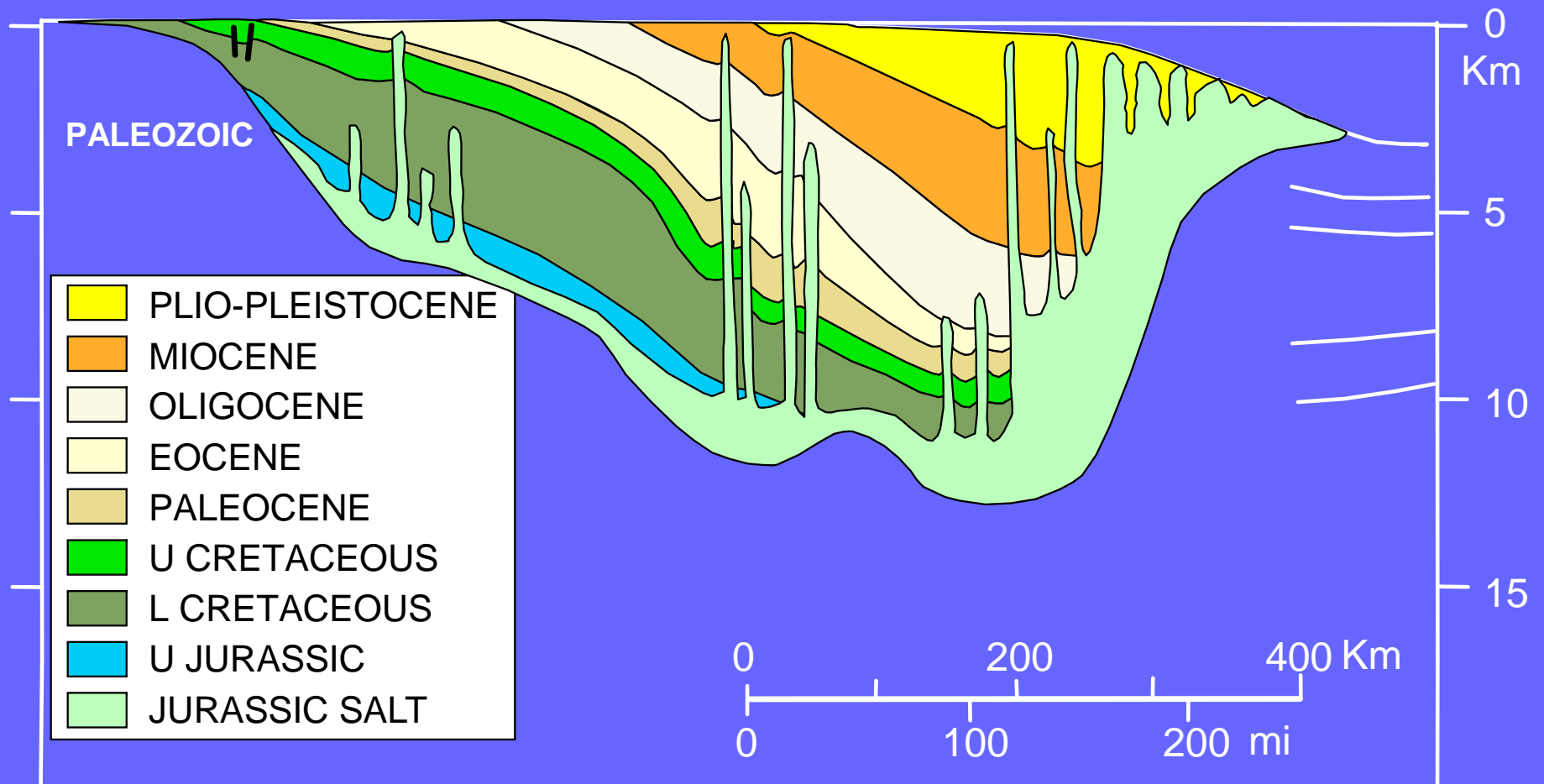


modified after Dixon, et al., 1992

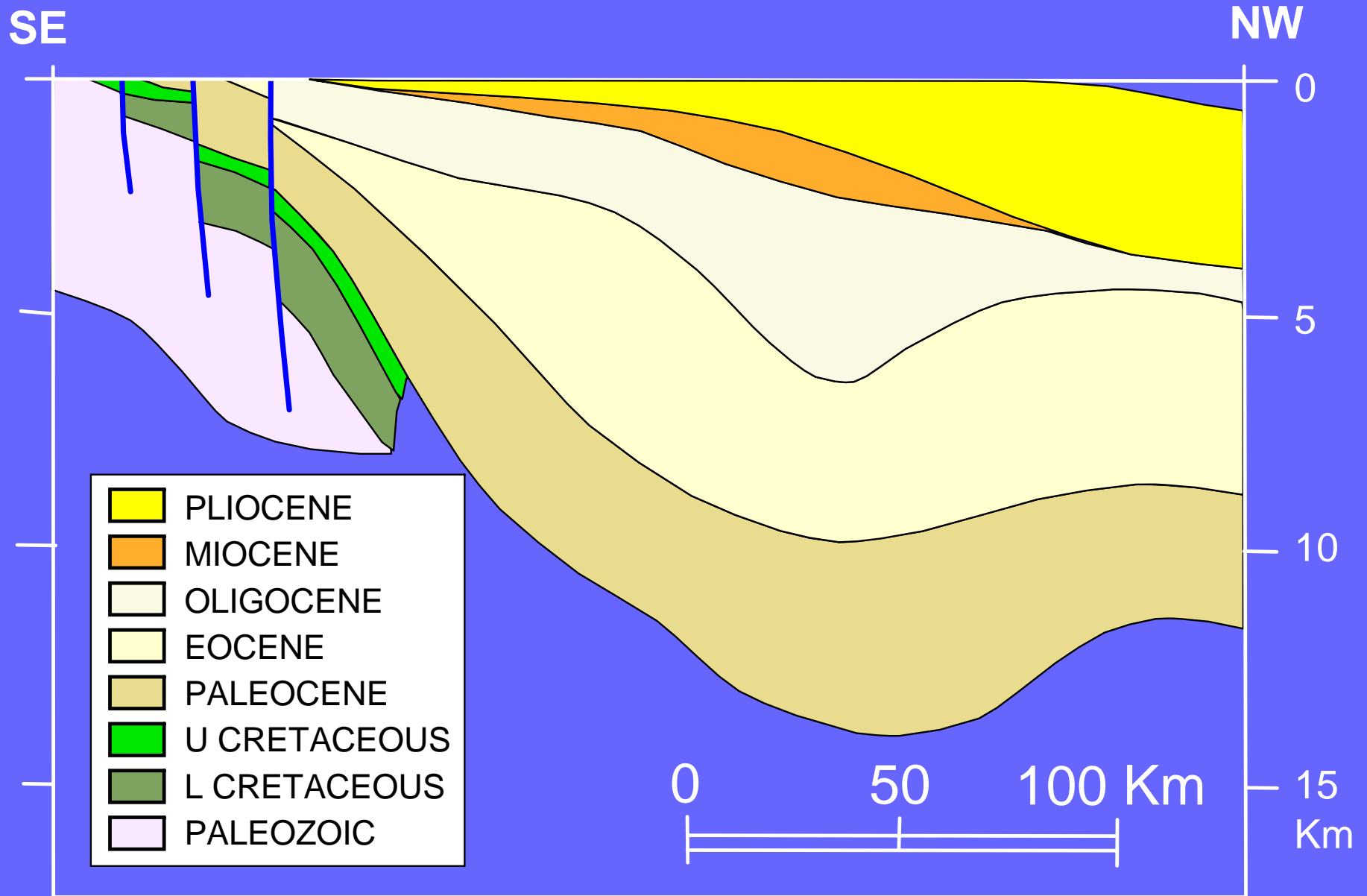
NW

GULF COAST BASIN

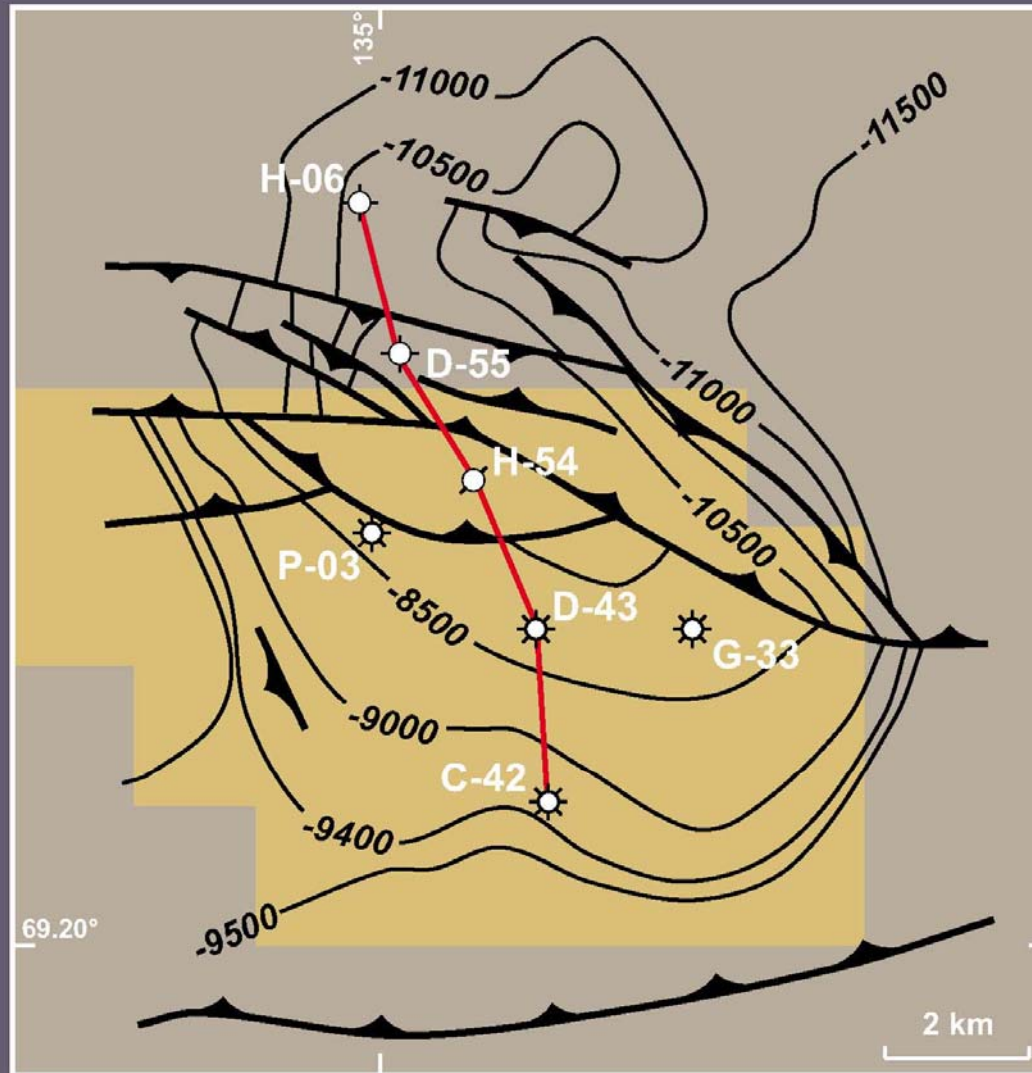
SE



BEAUFORT- MACKENZIE BASIN



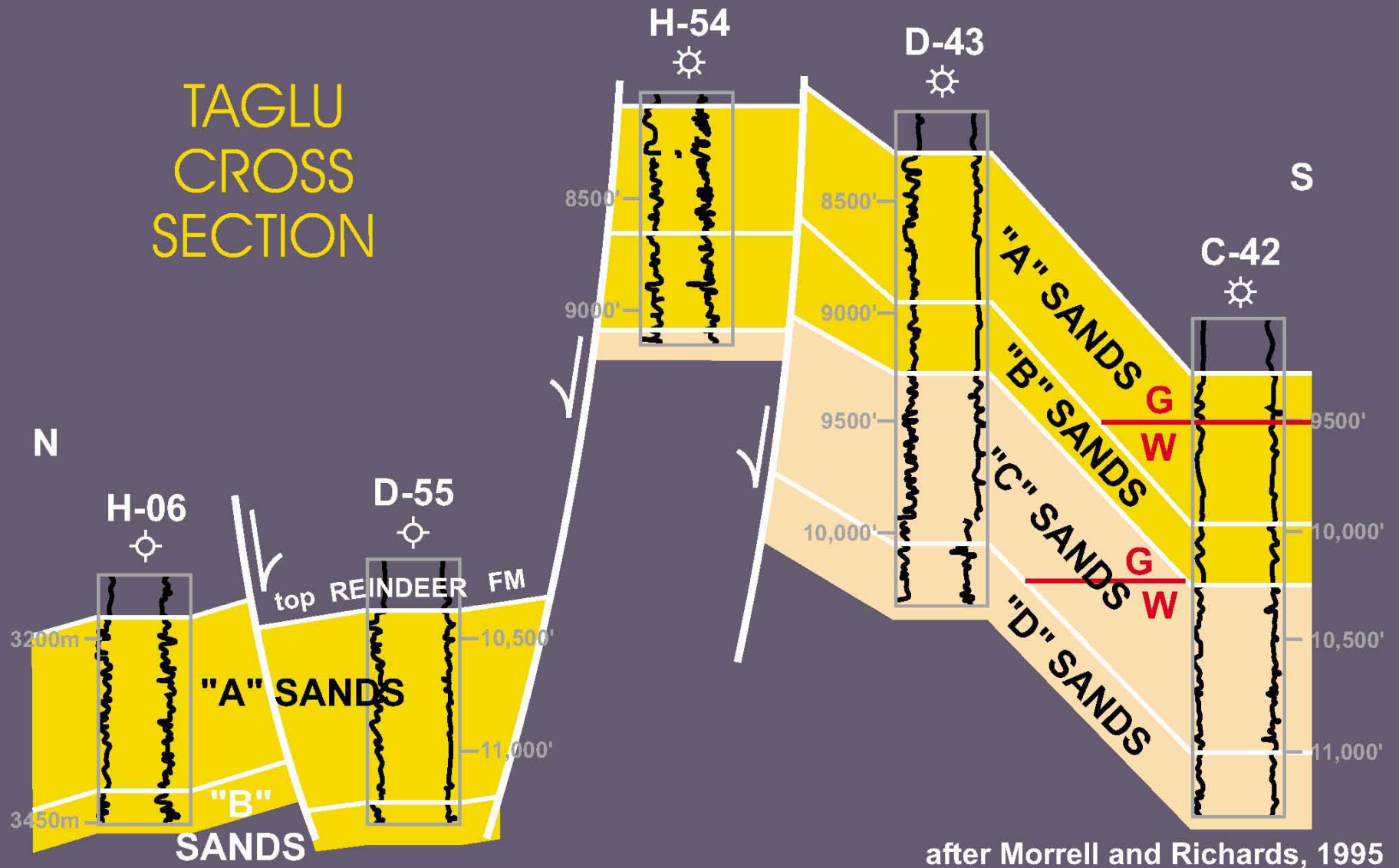
TAGLU STRUCTURE CONTOUR MAP



Taglu SDL

after Morrell and Richards, 1995

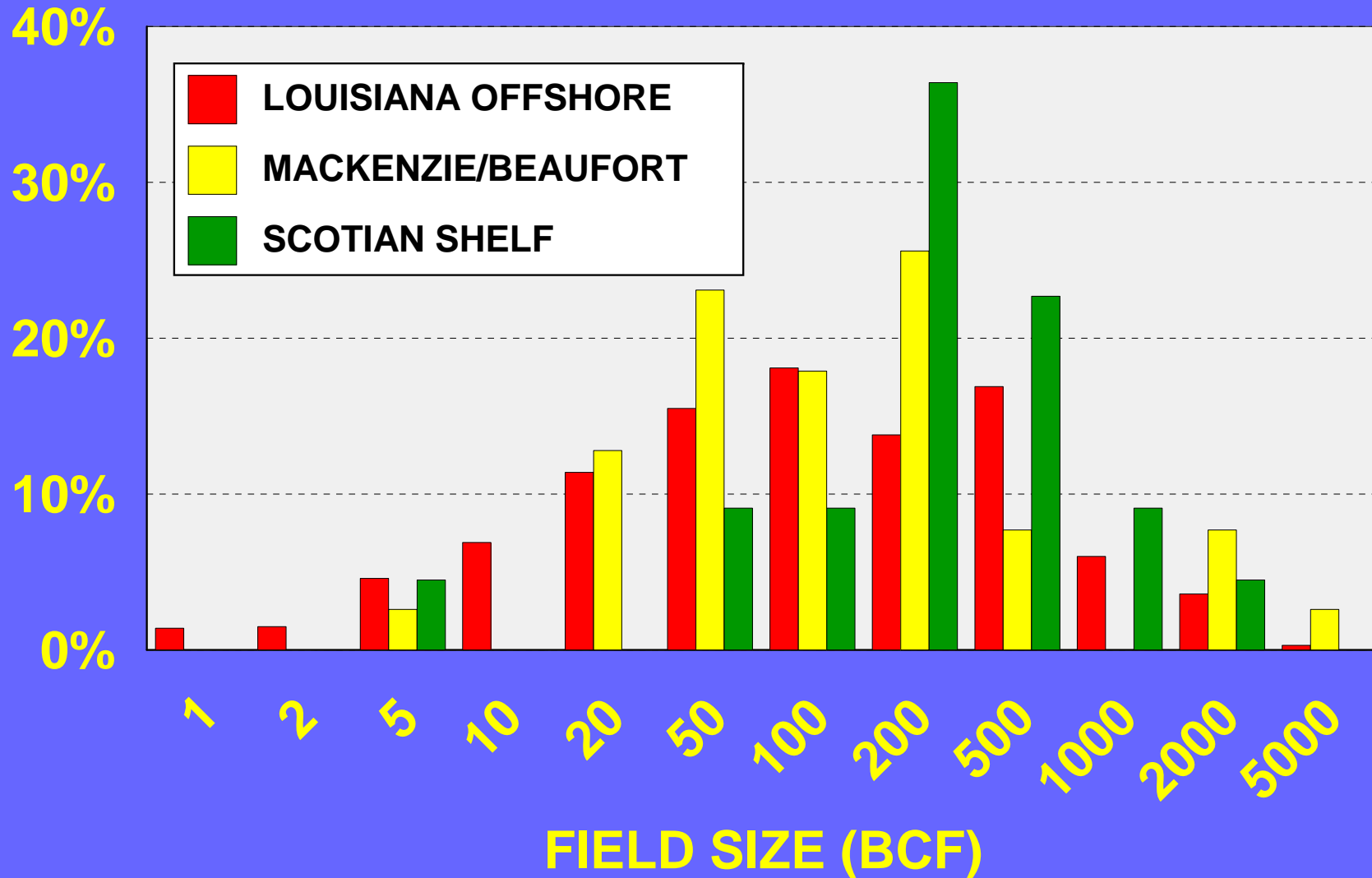
TAGLU CROSS SECTION



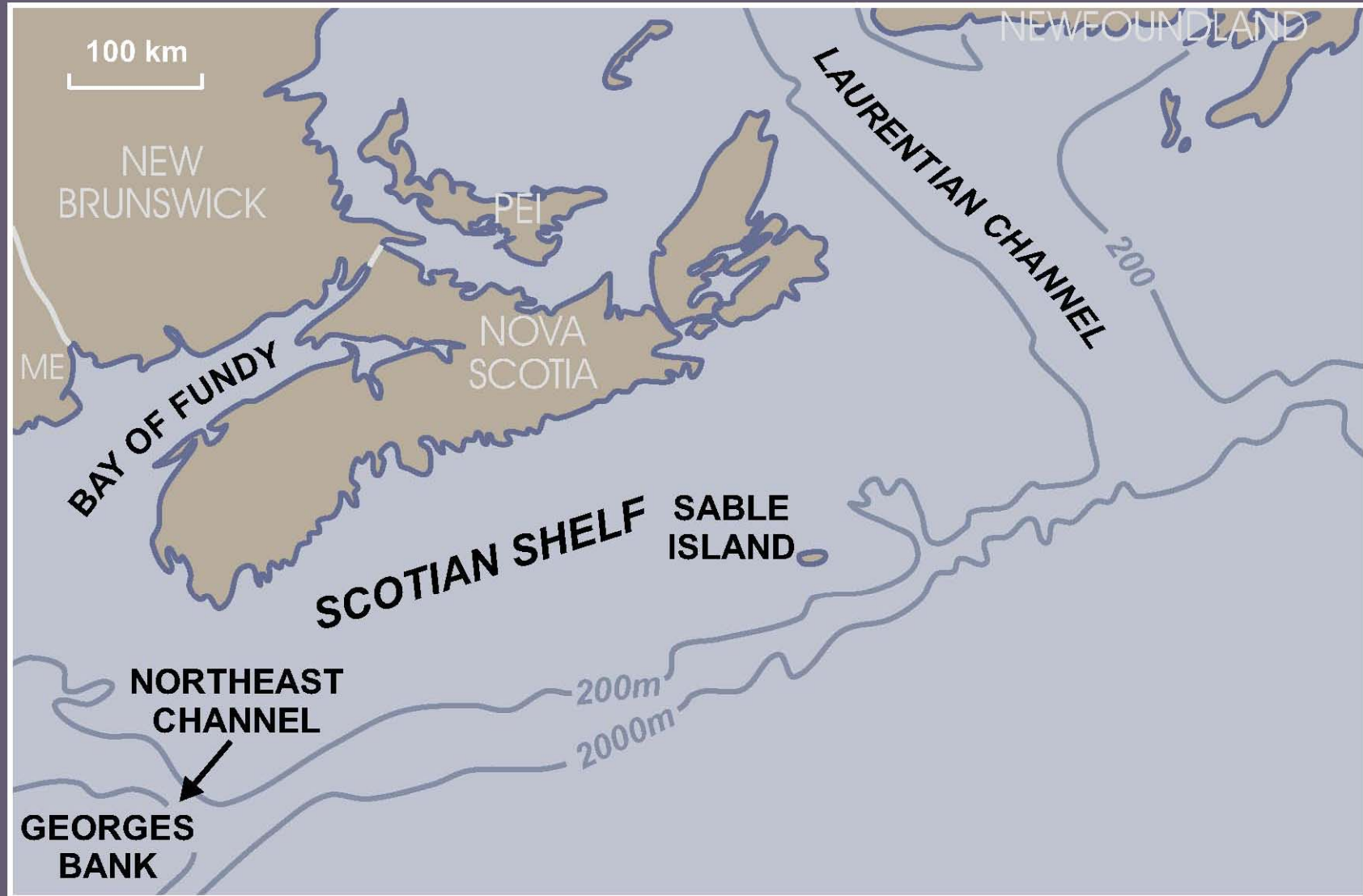
THREE DELTA AREAS – STATISTICS **(December 31, 2002)**

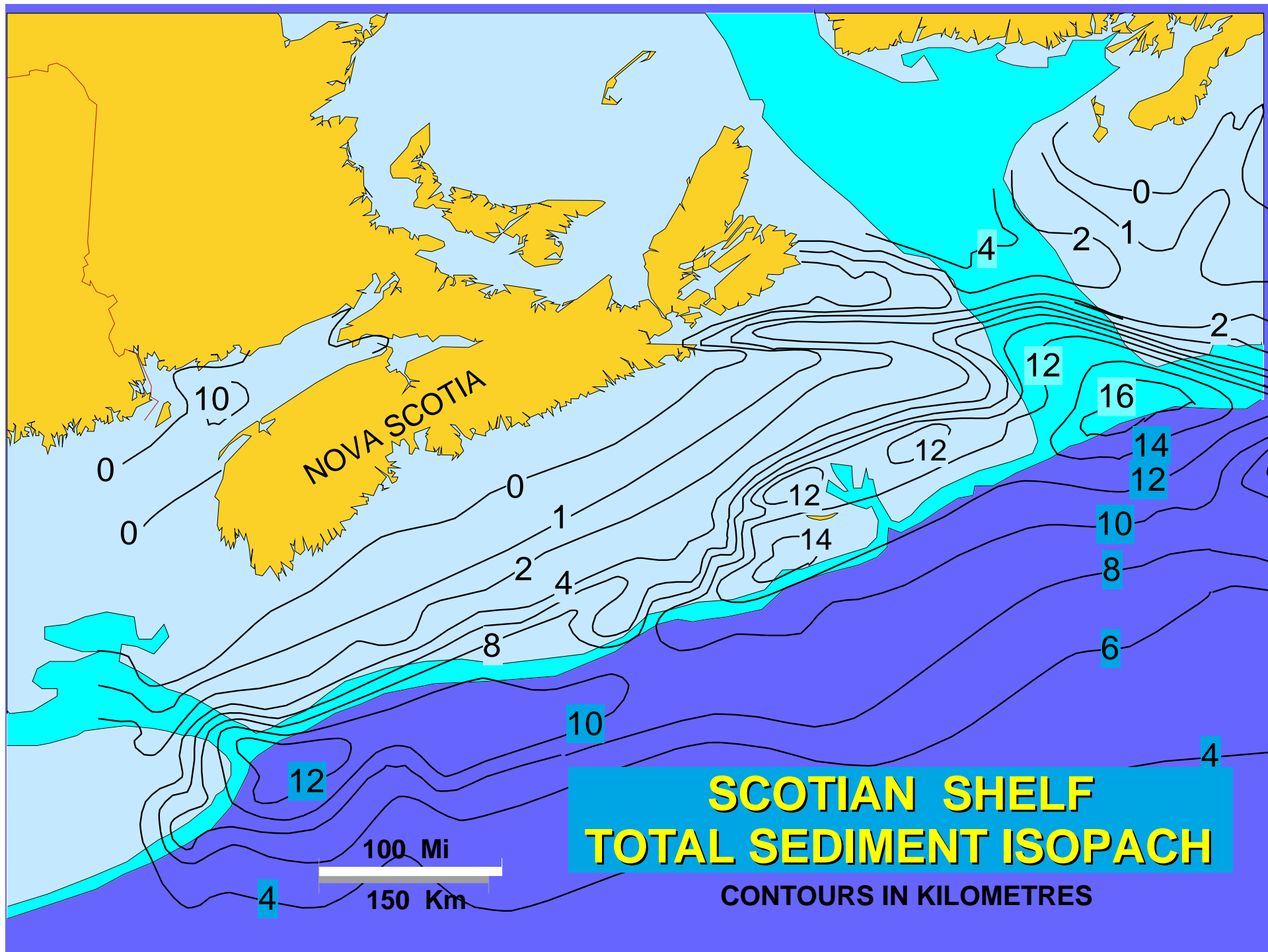
	NUMBER OF WELLS	NUMBER OF FIELDS	AVERAGE FIELD SIZE (BCF)	CUMULATIVE PRODUCTION (BCF)
BEAUFORT/ MACKENZIE BASIN	247	39	230	1.5
SCOTIAN BASIN	169	21	320	511
LOUISIANA GULF COAST BASIN	~68,000	6400	58	256,287

COMPARISON OF THE THREE AREAS GAS FIELD SIZE DISTRIBUTION



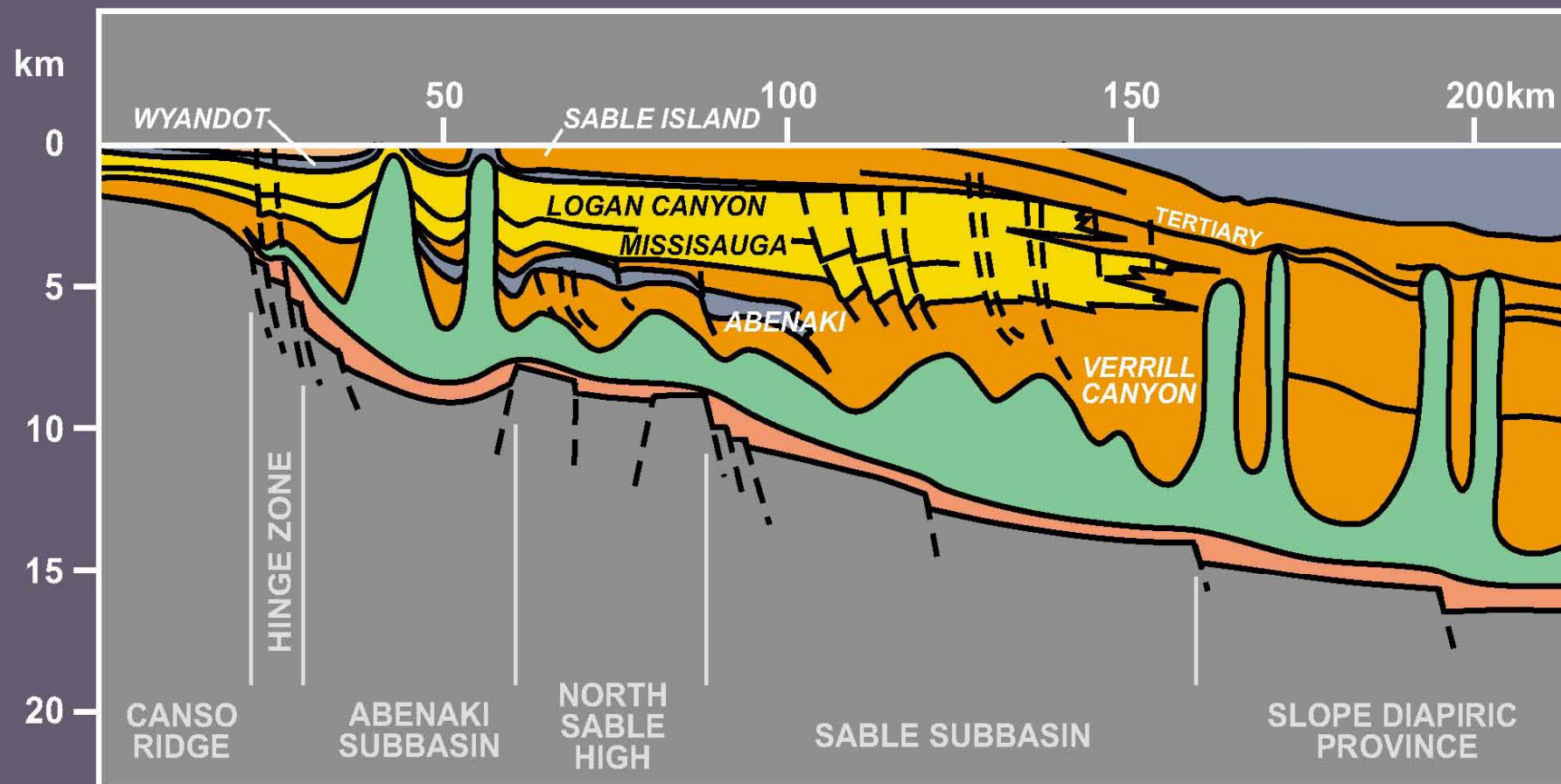
SCOTIAN SHELF



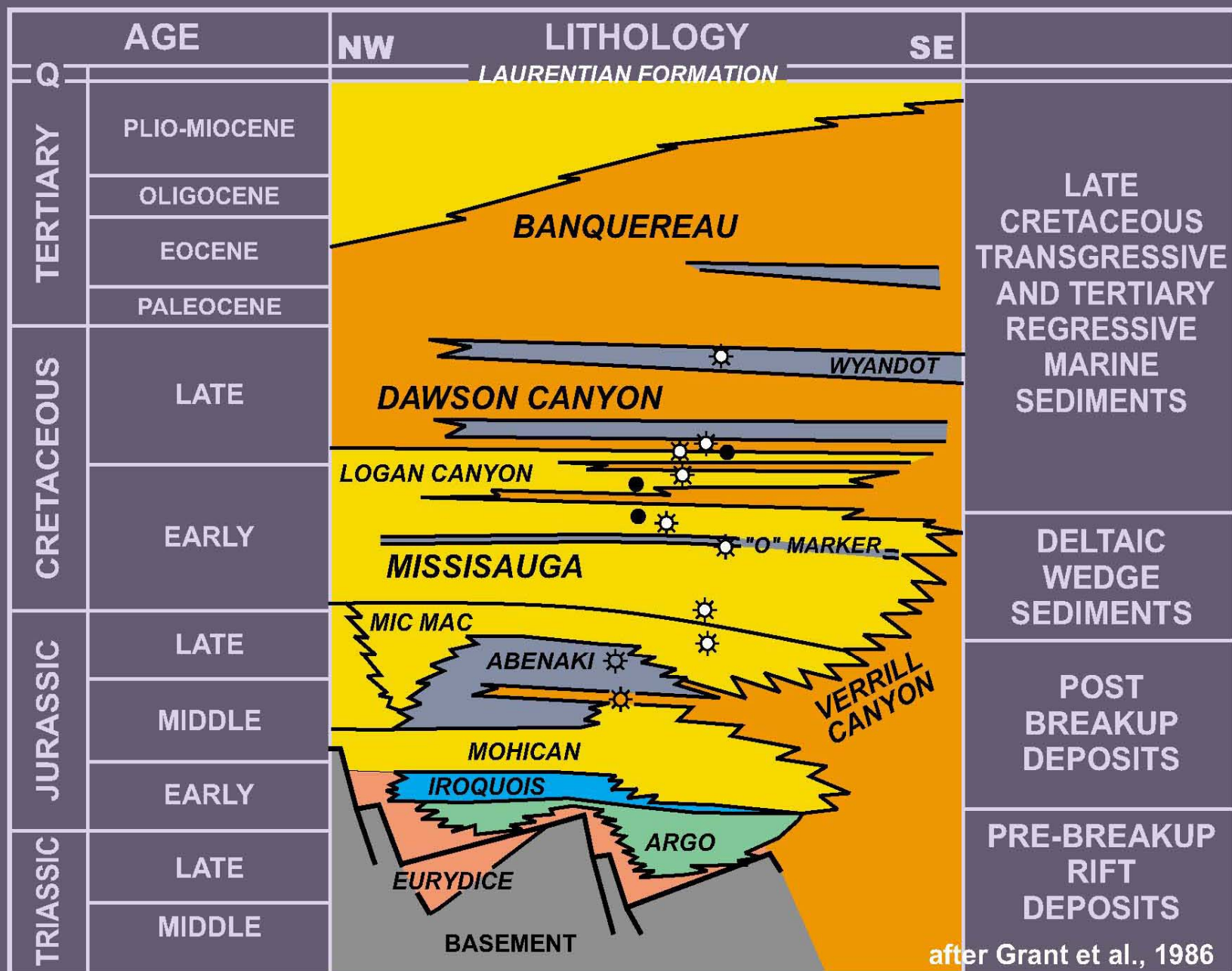


NW

SE



after Wade, 1981



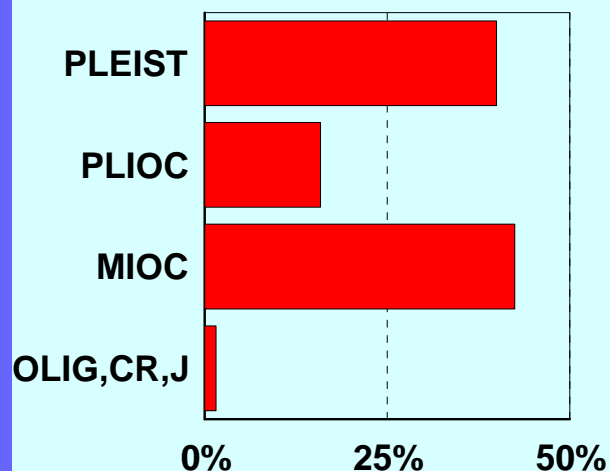
GEOLOGICAL COMPARISON OF DELTA COMPLEXES

	AGE	DELTA SOURCE (Depocenter)	MAIN TRAPPING MECHANISM	SOURCE ROCK	
				ORGANIC MATURITY	ORGANIC RICHNESS
BEAUFORT/ MACKENZIE BASIN	Tertiary	Single (shifting, super- imposed)-	Growth faults, roll-over anticlines	Low to moderate	High
LOUISIANA GULF COAST BASIN	Tertiary	Single (shifting, super- imposed)-	Growth faults, roll-over anticlines, salt diapirs	Low to moderate	High
SCOTIAN BASIN	Jurassic/ Cretaceous	Multiple (super- imposed)- and divergent)	Growth faults, roll-over anticlines, salt diapirs	Moderate to high	Moderate

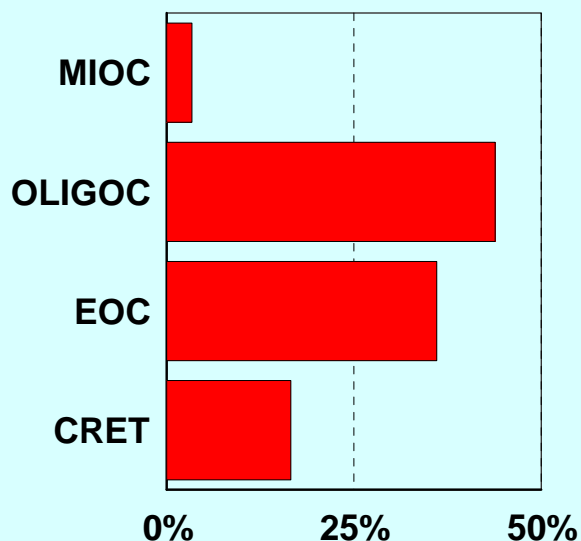
COMPARISON OF THE THREE AREAS

STRATIGRAPHIC DISTRIBUTION OF NATURAL GAS

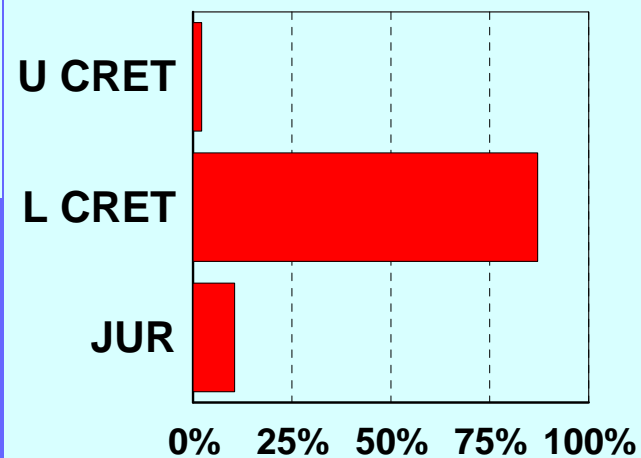
GULF OF MEX OFFSHORE



BEAUFORT-MACKENZIE



SCOTIAN SHELF



RECOVERABLE GAS RESOURCES (TCF)

December 31, 2002

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CONCLUSIONS

- For North American future gas supply - the future is now. Have to look elsewhere immediately. Based on present trends - short of gas by 2015 - 2020.
- North American gas supply will have to shift to frontier areas - Arctic and Eastern seaboard.
- Places to explore for gas should be analagous to Gulf Coast - Beaufort / Mackenzie Delta and Scotian Basin.