

# ***Oil and gas potential of northern mainland sedimentary basins of Mackenzie Corridor: an update***

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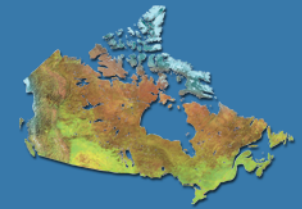
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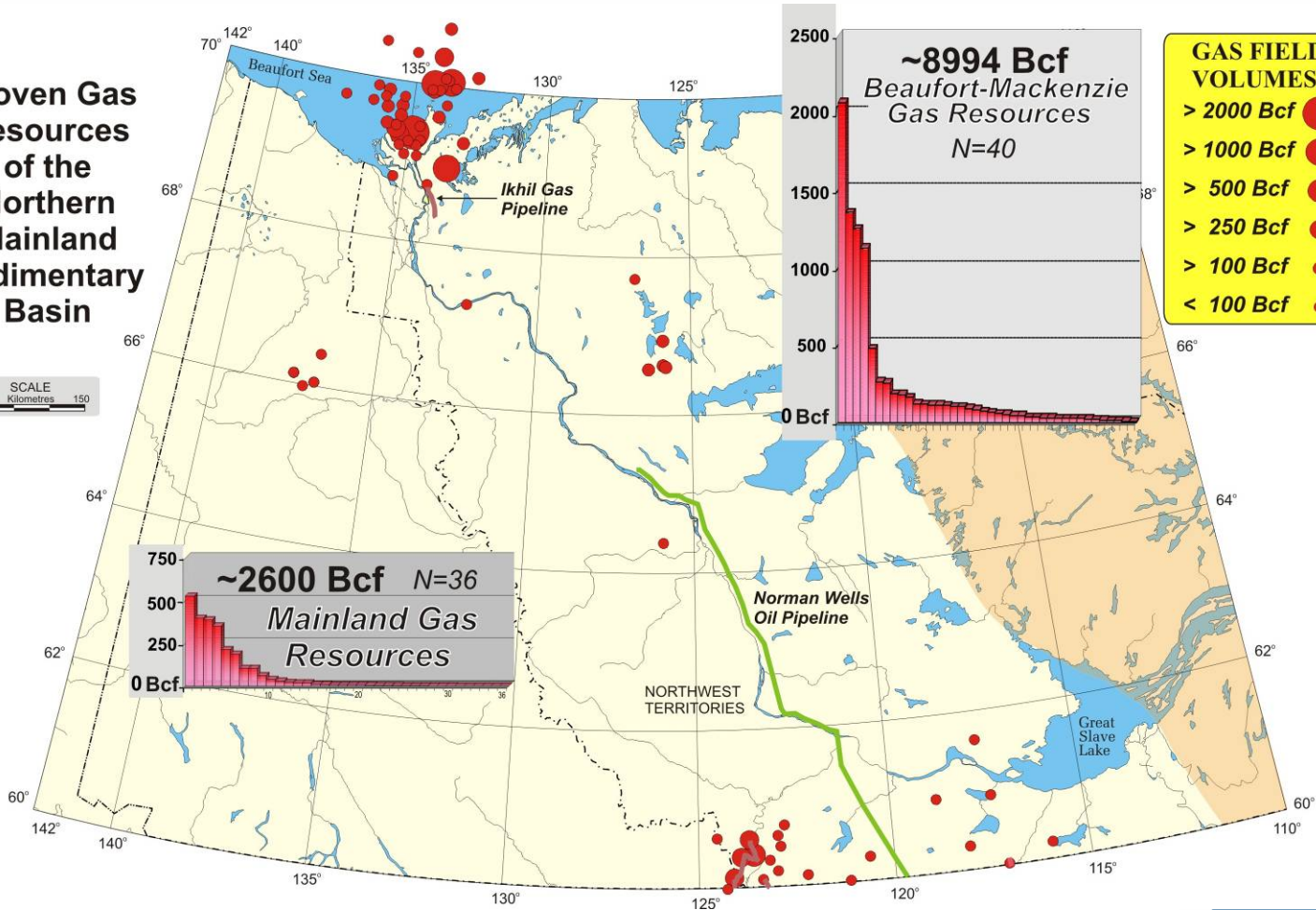


# Resources of Northern Mainland



Proven Gas Resources of the Northern Mainland Sedimentary Basin

SCALE  
0 150  
Kilometres



From Morrow et al. (2006)



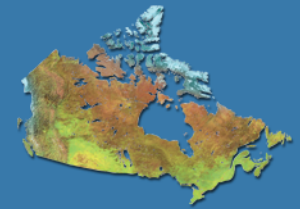
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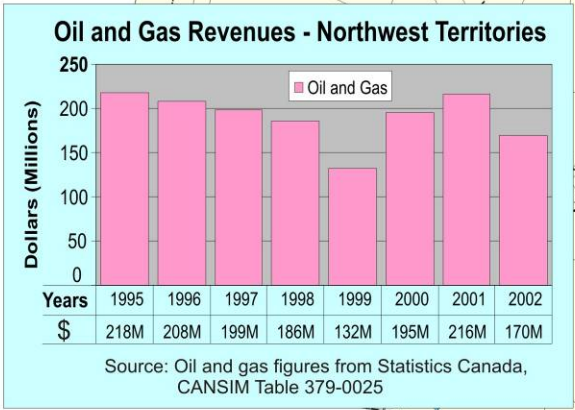
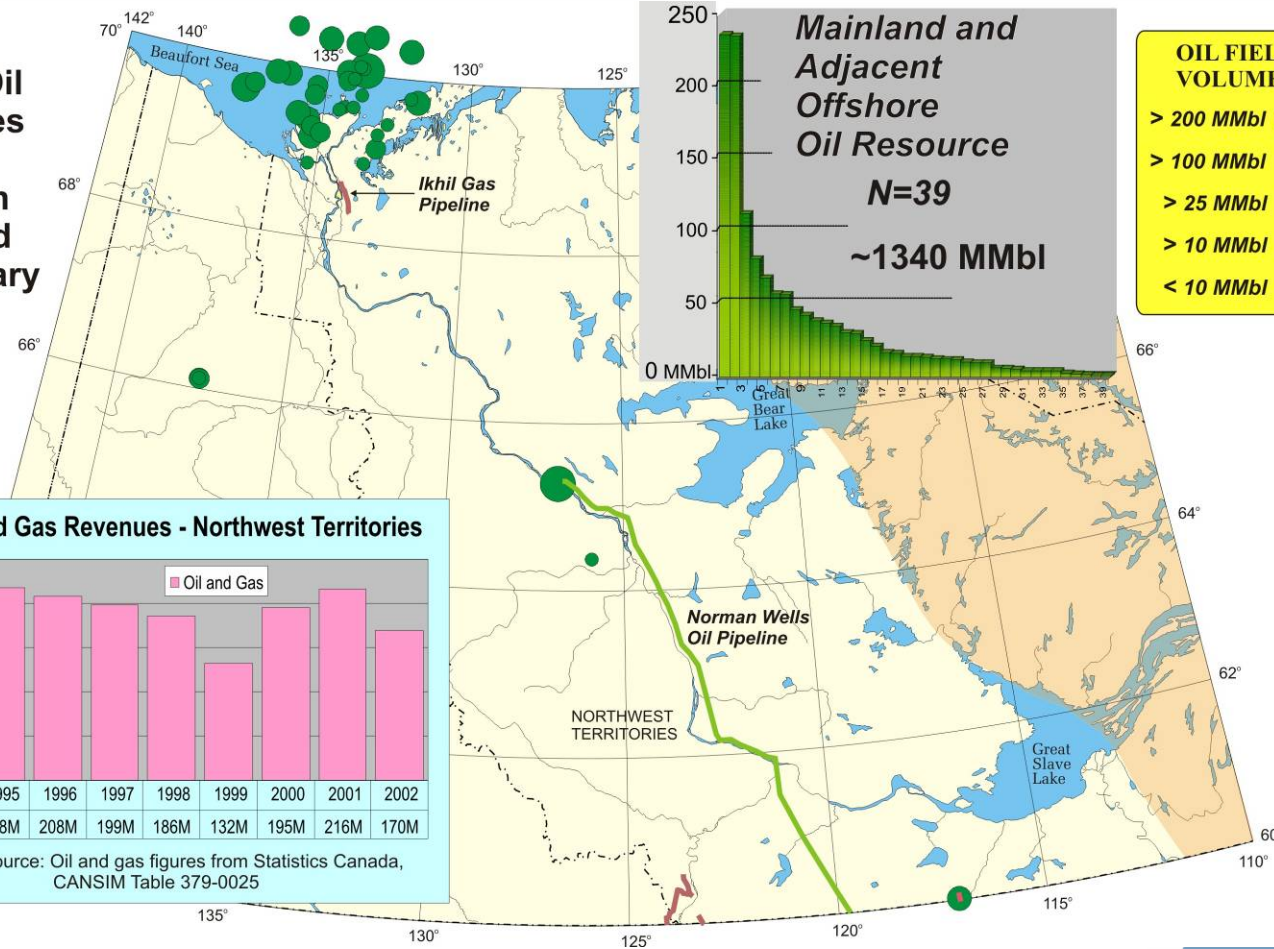


# Resources of Northern Mainland



**Proven Oil Resources of the Northern Mainland Sedimentary Basin**

SCALE  
Kilometres 150

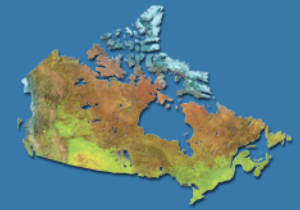


From Morrow et al. (2006)





# Gas Potential - Mackenzie Corridor



## Gas Potential in Mackenzie Corridor (north of 62°)

(Source: Canadian Gas Potential Committee)

	<u>GIP</u>	<u>NIM</u>
2005:	10	7
2001 <sup>1</sup> :	8	5
1997 <sup>2,3</sup> :	4	2.9

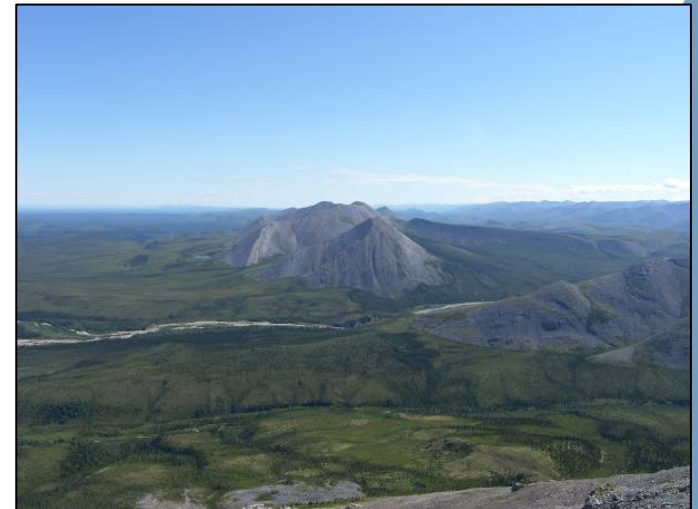
**GIP: Gas in Place (Tcf)**

**NIM: Nominal Initial Marketable (Tcf)**

<sup>1</sup>Current to 1998

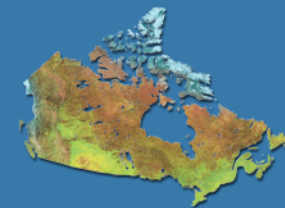
<sup>2</sup>Current to 1993

<sup>3</sup>Colville Hills and surrounding areas





# GSC Methodology (PETRIMES)



❖ **Discovery process model**  
(mature plays)

❖ **Volumetric probability distribution model**  
(immature and conceptual plays)

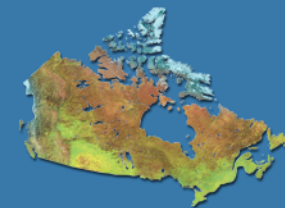


❖ **In both models, estimates of pool sizes and number of pools in the play are needed to obtain resource potential.**





# Play Categories



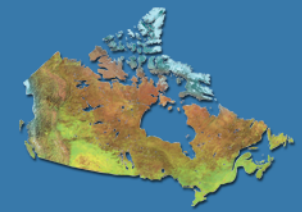
❖ **ESTABLISHED PLAYS:** *Those plays that are demonstrated to exist by virtue of discovered pools with established reserves (mature and immature)*

❖ **CONCEPTUAL PLAYS:** *Those plays that do not yet have discoveries or reserves but which may exist according to geological analysis*

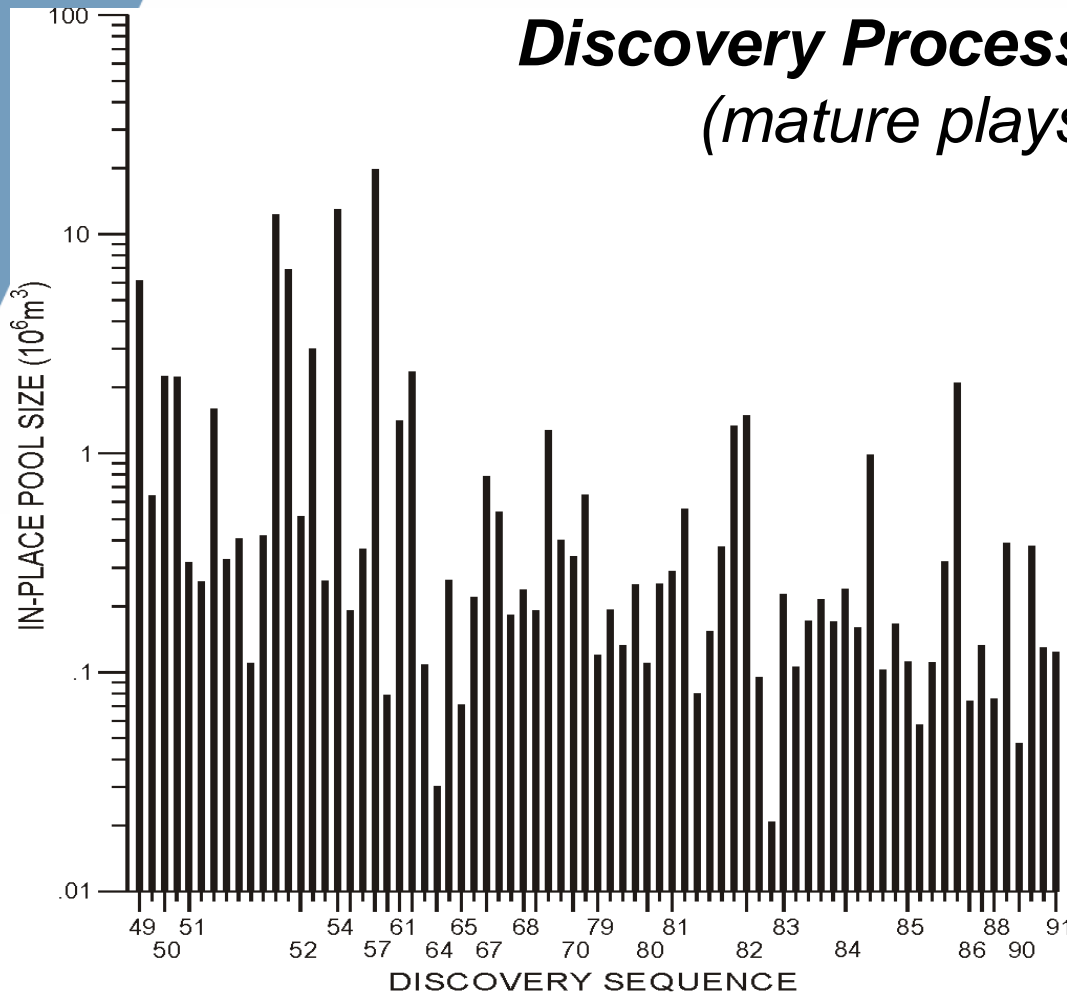




# Data required for assessing established mature plays



## Discovery Process Model (mature plays)

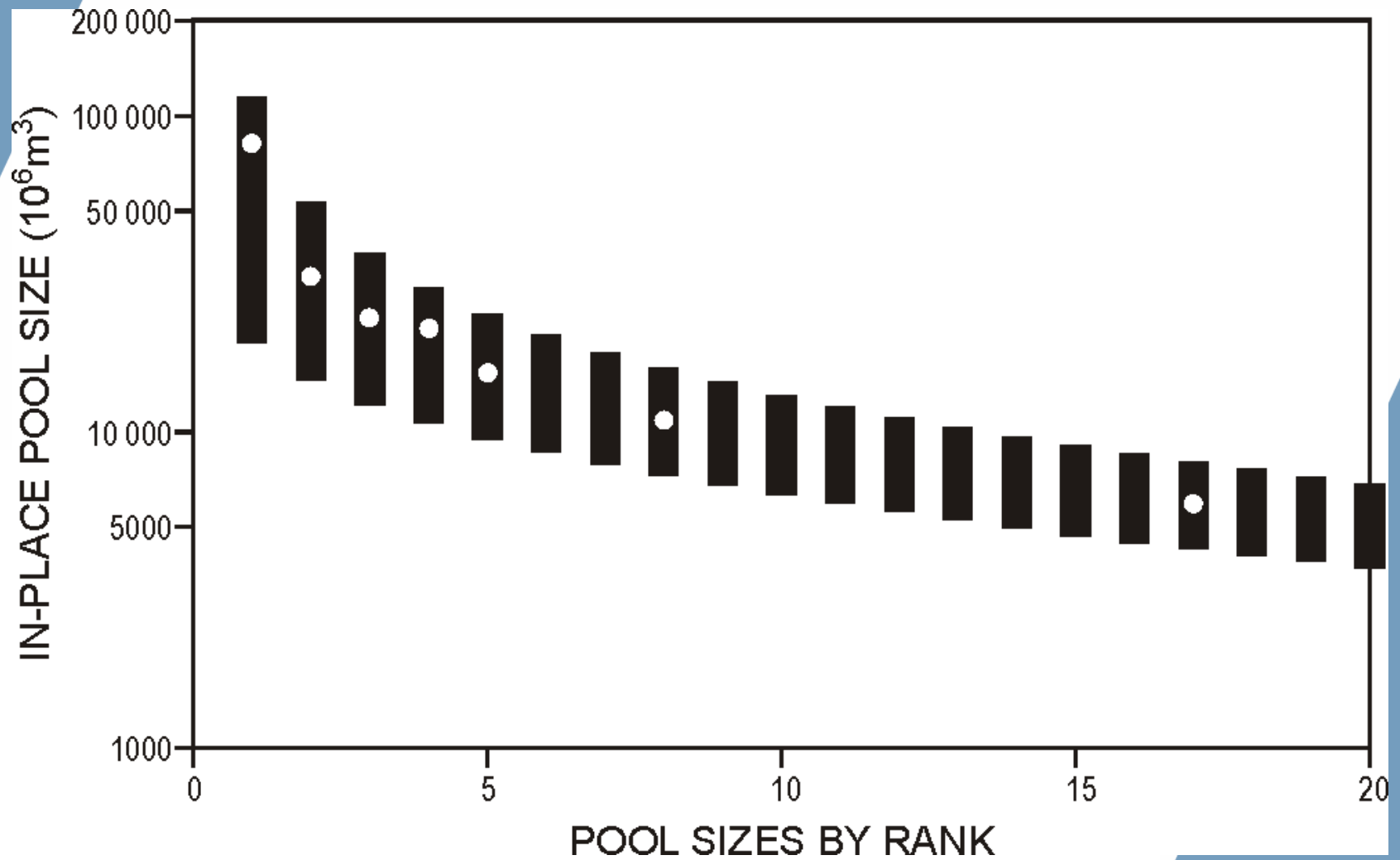
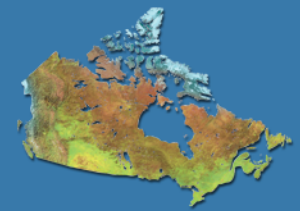


- ❖ *Pool or field size*
- ❖ *Discovery date*



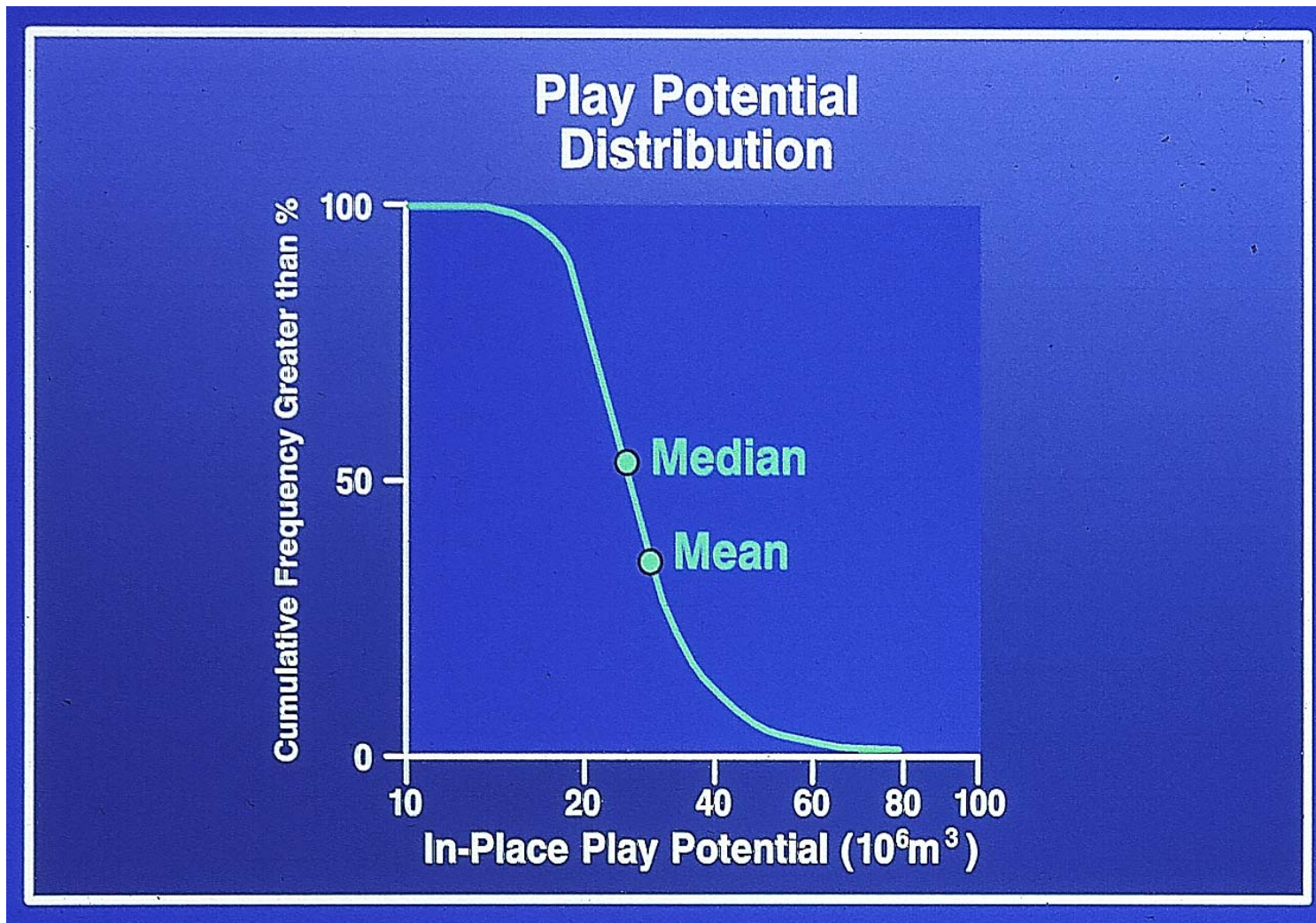
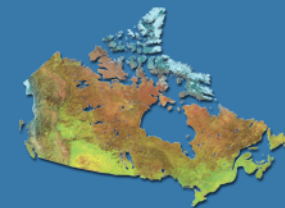


# Pool-size-by-rank plots



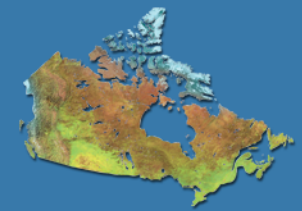


# Play Potential Distribution Curve





# Data for immature and conceptual plays



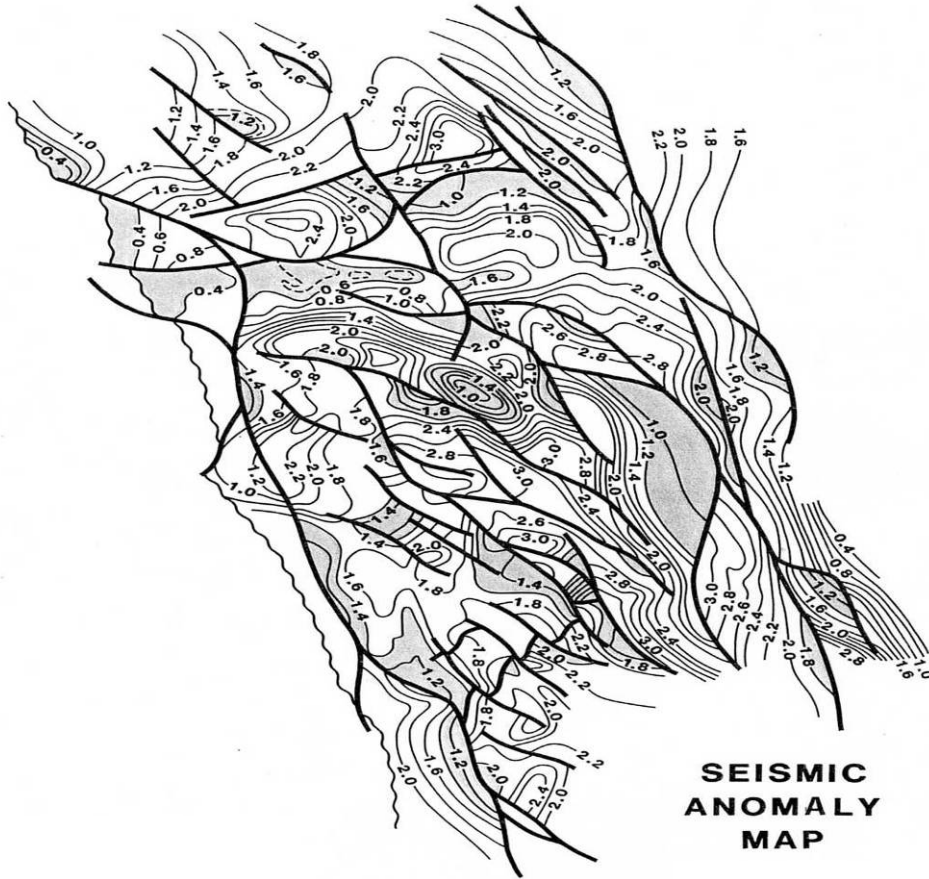
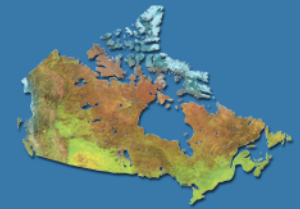
## ***Volumetric Probability Distribution Method: (immature and conceptual plays)***

- ❖ ***Area of closure***
- ❖ ***Net pay or formation thickness***
- ❖ ***Porosity***
- ❖ ***Trap fill***
- ❖ ***Water saturation***
- ❖ ***Formation volume factors***





# Area of Closure

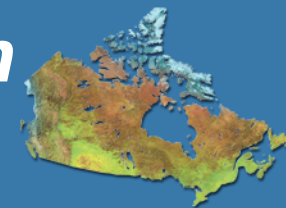


- ❖ Largest area
- ❖ Median area
- ❖ Smallest area
- ❖ N of prospects





# Pool Size Probability Distribution Data Input



## Probability in upper percentiles

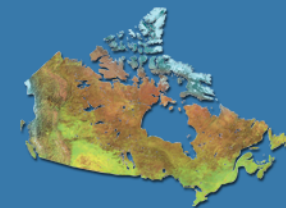
### Reservoir parameters

	<u>1.0</u>	<u>0.5</u>	<u>0.01</u>	<u>0.0</u>
Area of closure (km <sup>2</sup> )	1	3	100	300
Formation thickness (m)	100	300	800	1000
Porosity (decimal fraction)	0.1	0.25	0.3	0.35
Trap fill (decimal fraction)	0.01	0.05	0.2	0.25





# Data for immature and conceptual plays



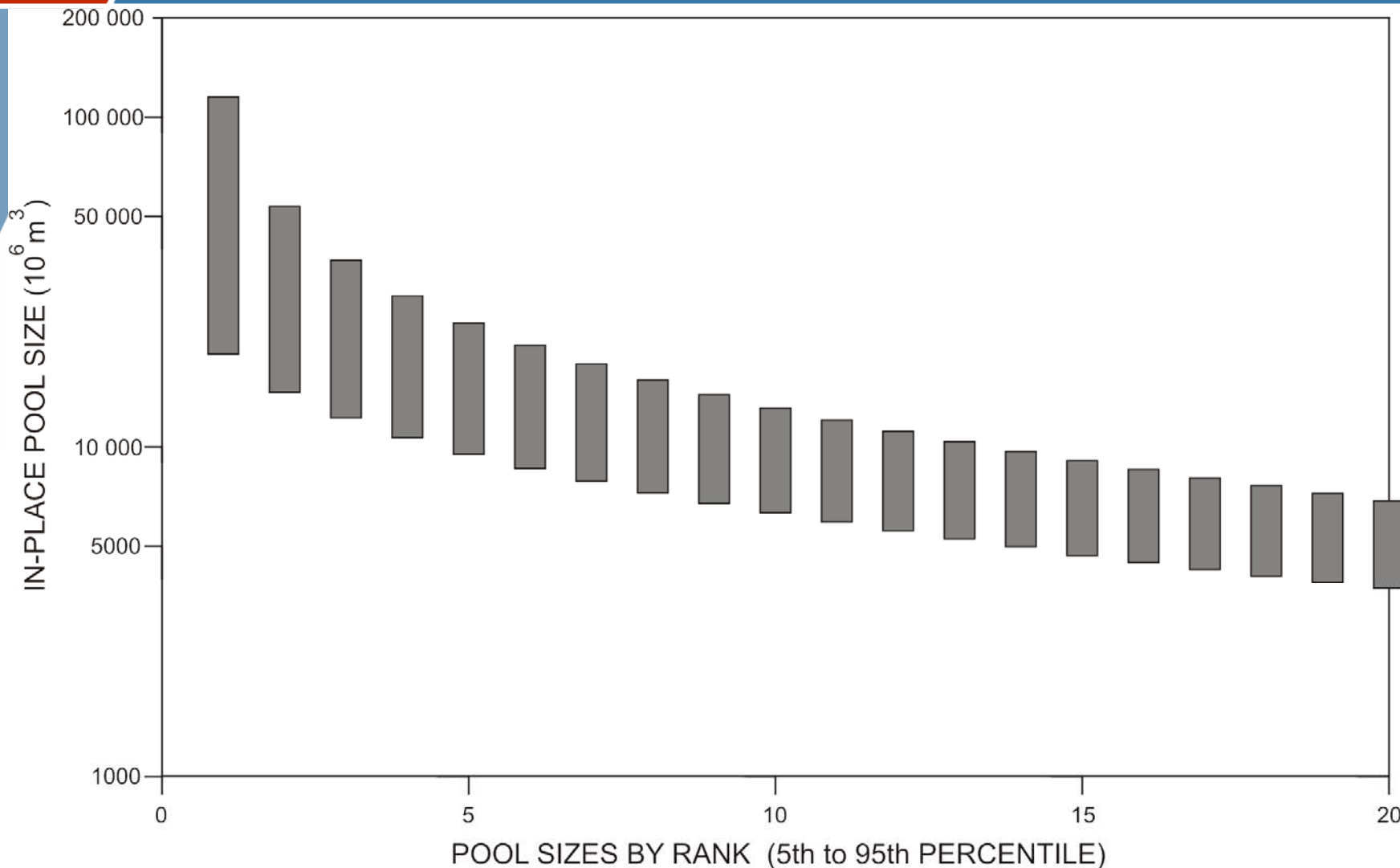
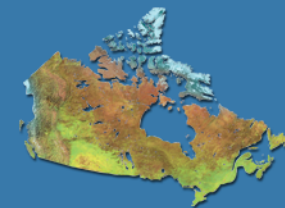
## Exploration risks of play

<b>Geological factors</b>	<b>Marginal probability</b>	<b>Play level</b>	<b>Prospect level</b>
Presence of closure	0.7		X
Presence of reservoir facies	0.9		X
Adequate seal	0.9		X
Adequate timing	0.8		X
Adequate source	0.4		X
Adequate preservation	0.7		X
Adequate recovery	0.9		X
Adequate play conditions	0.9	X	



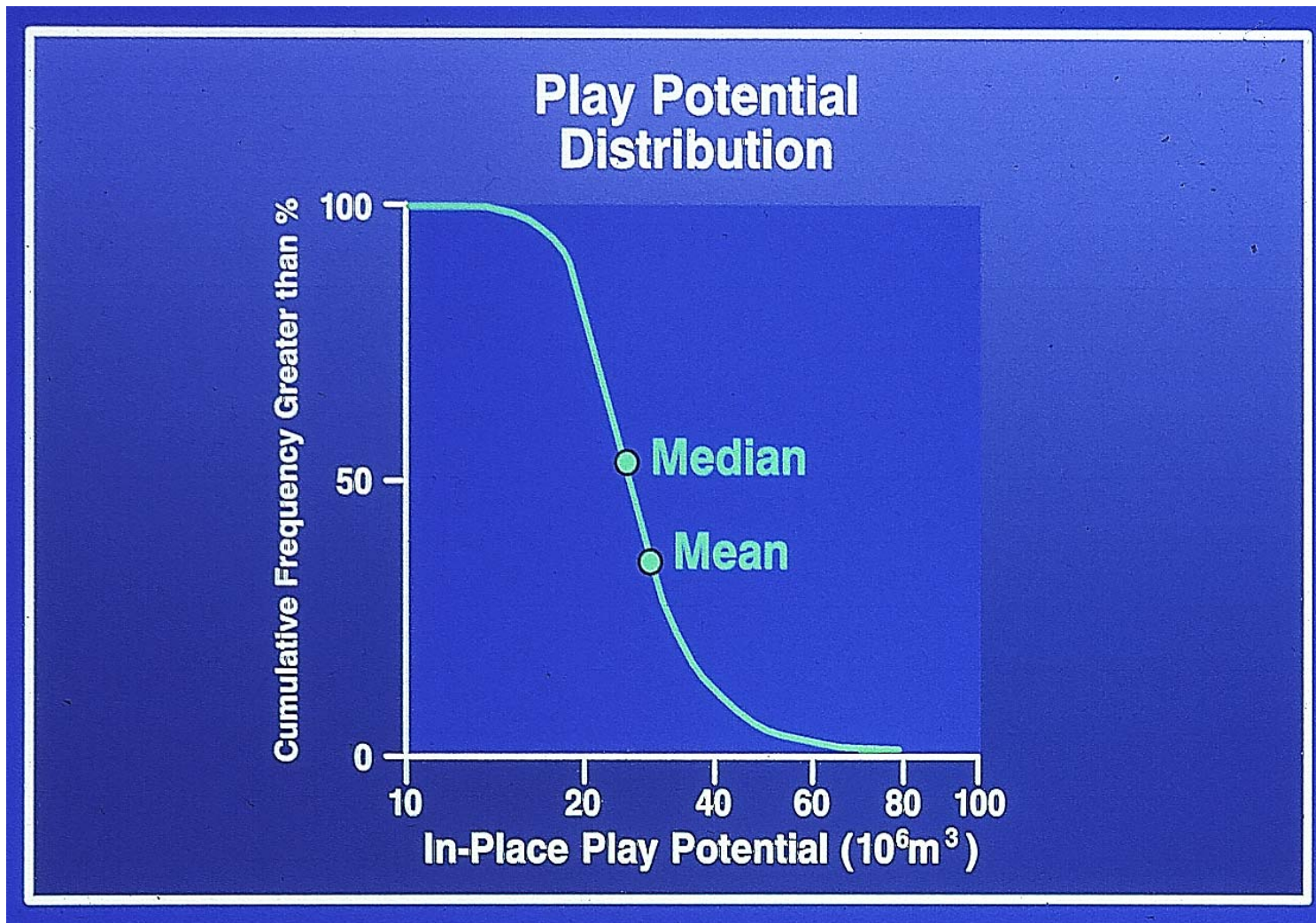
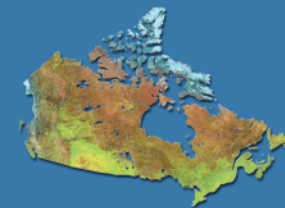


# Pool-size-by-rank plots



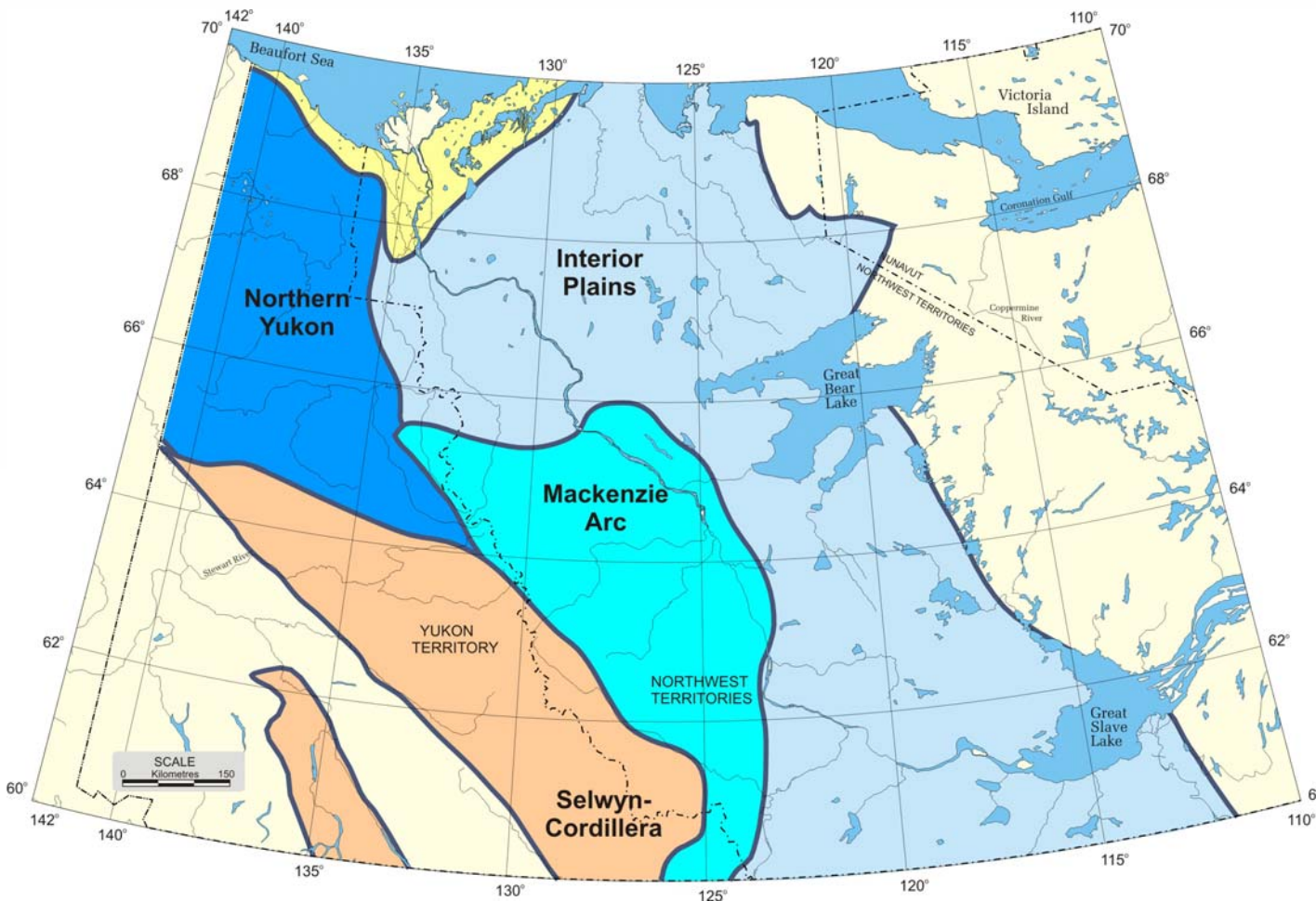
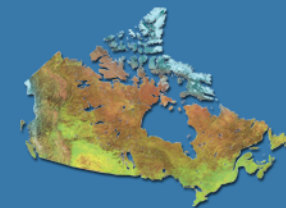


# Play Resource Distribution





# Hydrocarbon plays



*Modified from Morrow et al. (2006)*



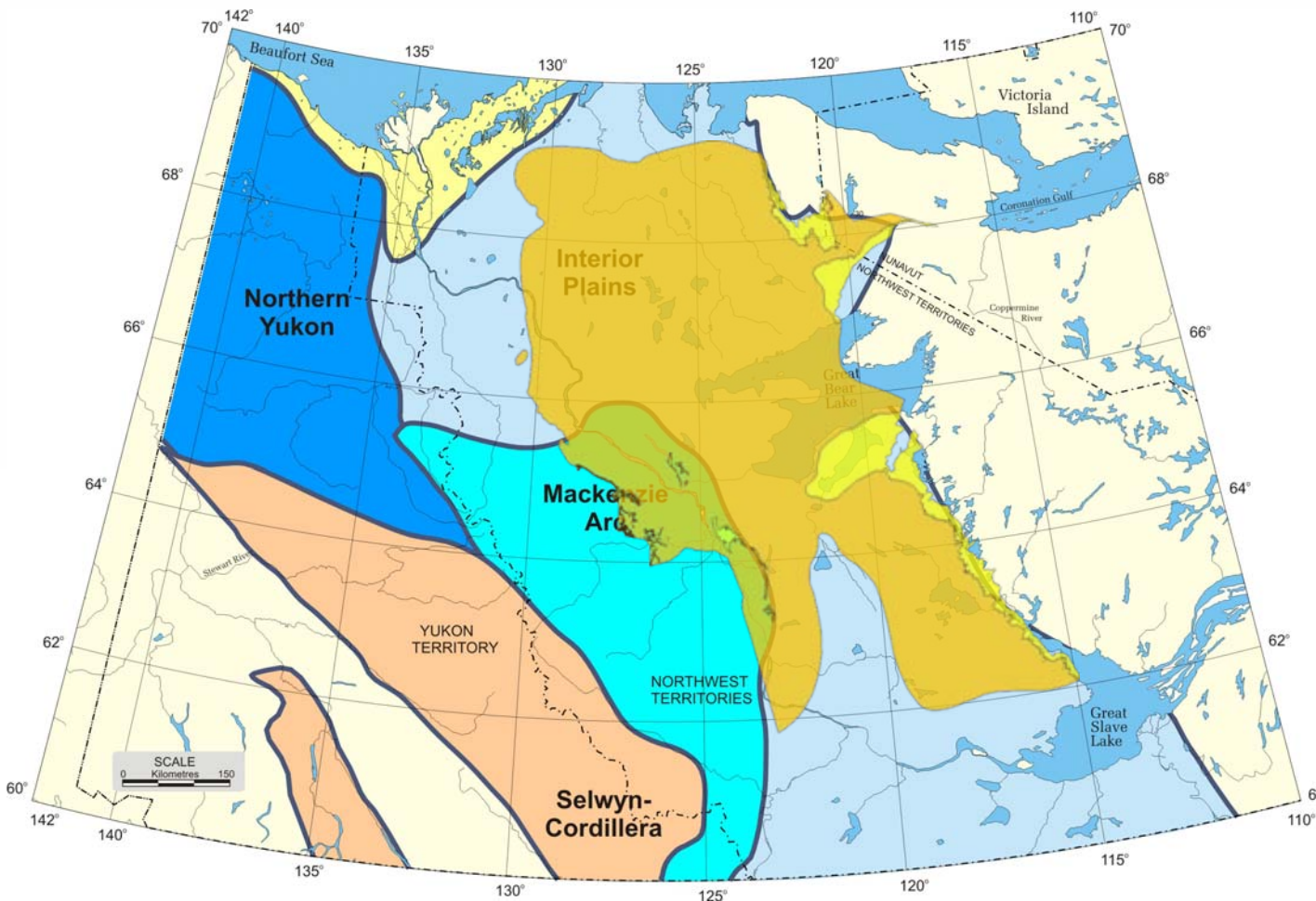
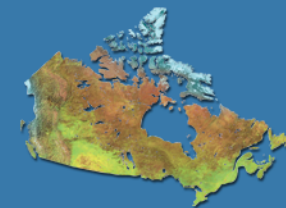
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# Hydrocarbon plays: Cambrian Clastics

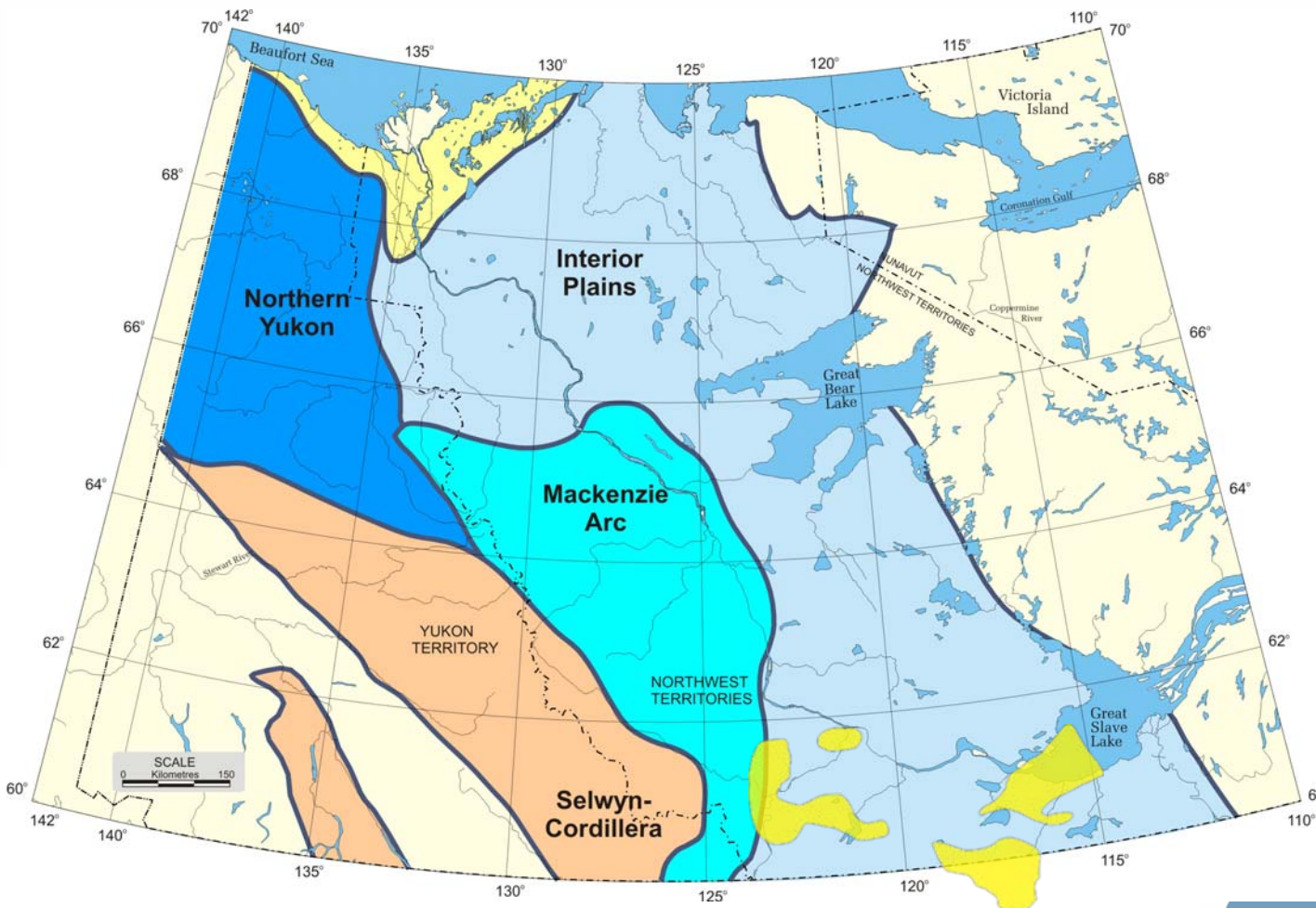
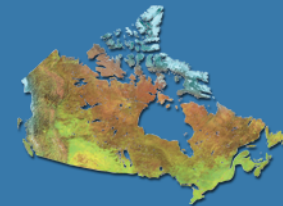


Modified from Morrow et al. (2006)





# Hydrocarbon plays: Pre-mid-Devonian Basal Clastics



*Modified from Morrow et al. (2006)*



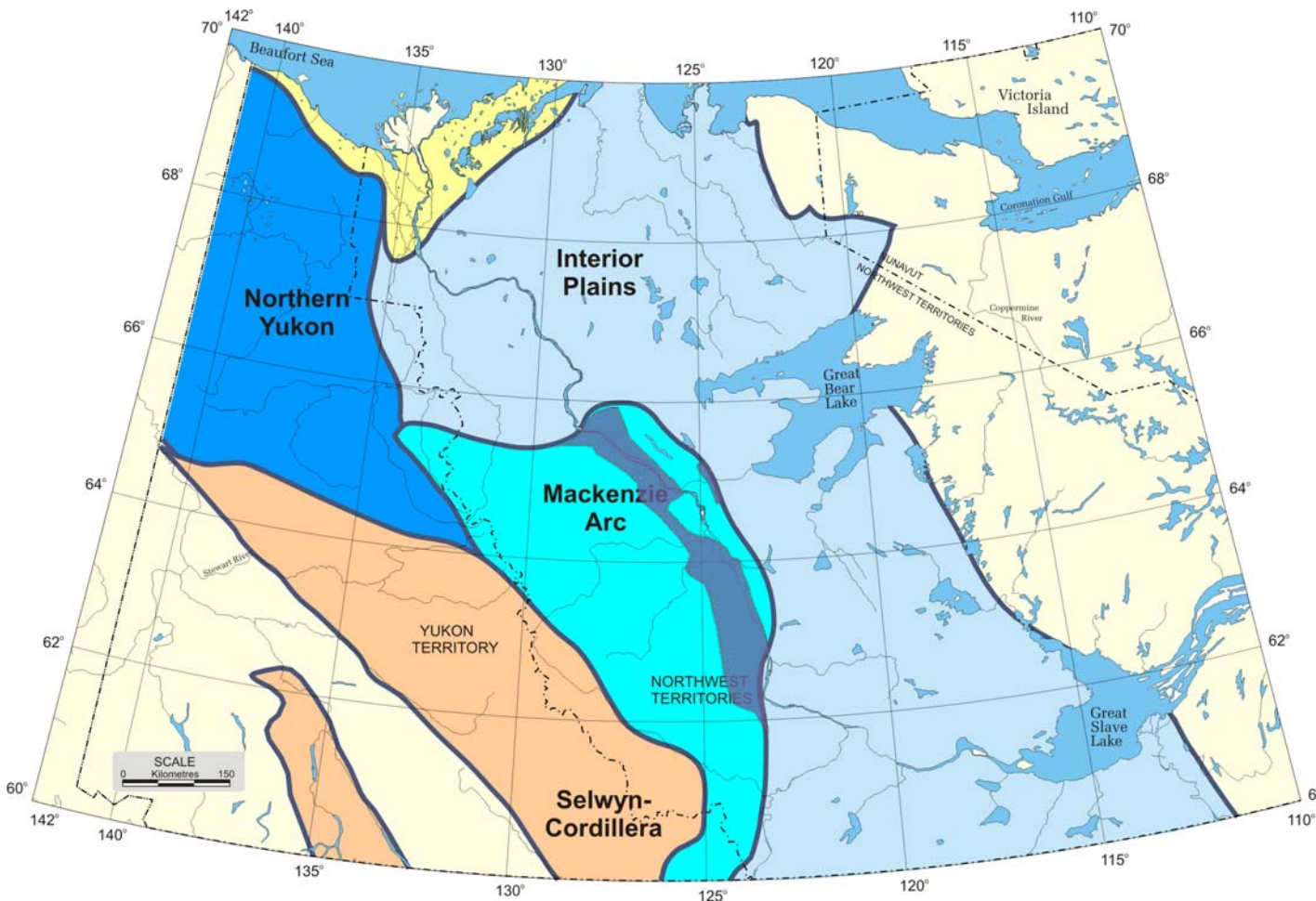
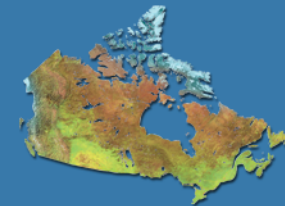
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# Hydrocarbon plays: Arnica-Landry Platform

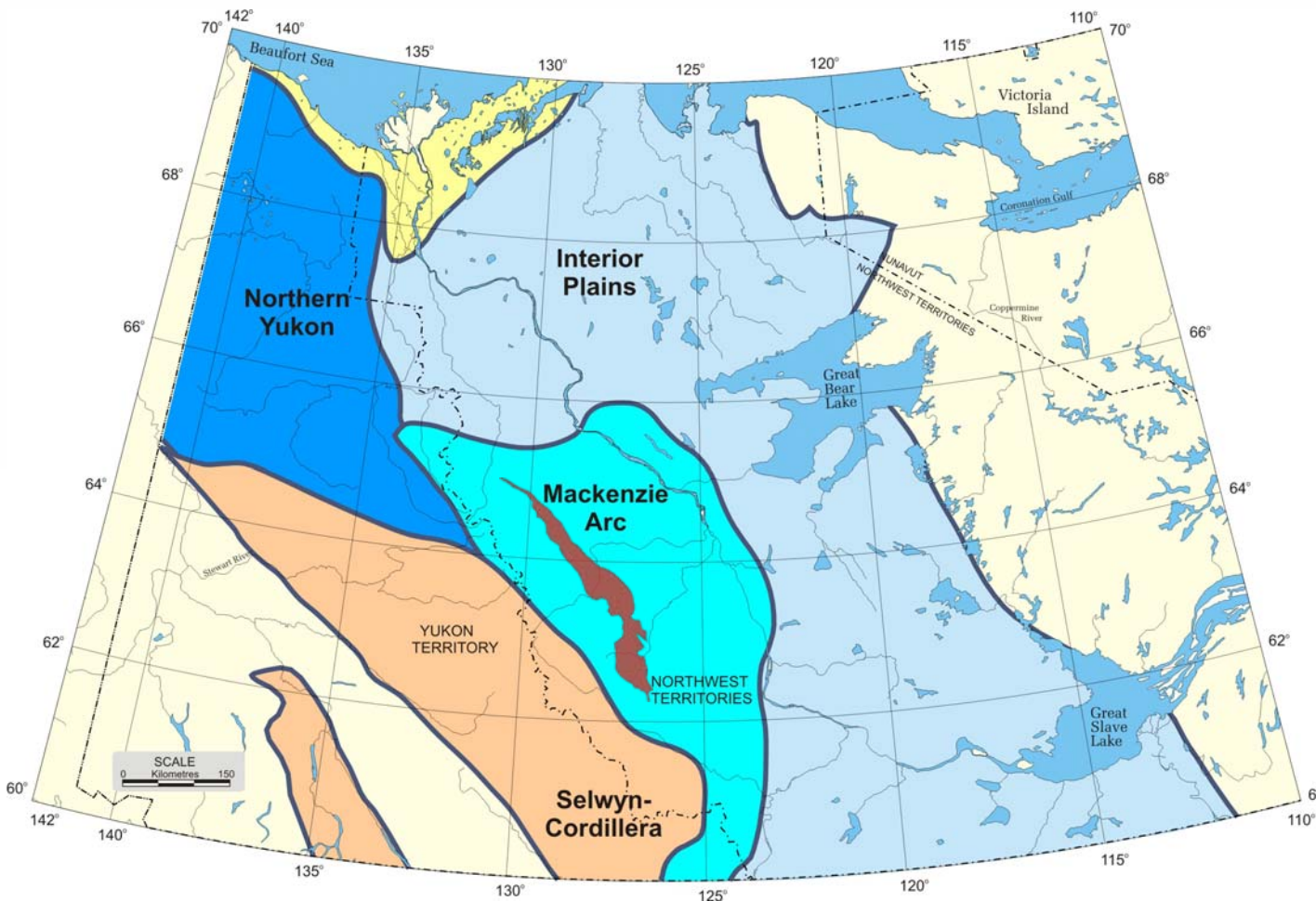
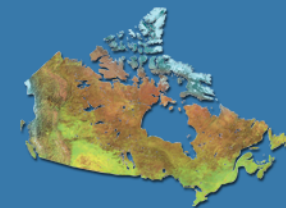


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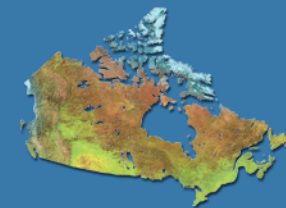


# Hydrocarbon plays: Plateau Overthrust



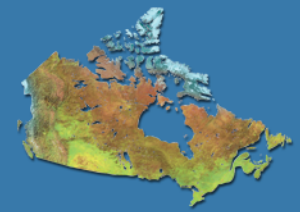


# Concluding remarks



- ❖ ***Oil and gas potential of Mackenzie Corridor focusing on petroleum plays that have high exploration interest***
- ❖ ***PETRIMES methodology will be used to conduct the resource assessment***
- ❖ ***Key outputs will be a series of Open File reports, culminating in a GSC Blue Book Bulletin (expected release in 2009)***





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