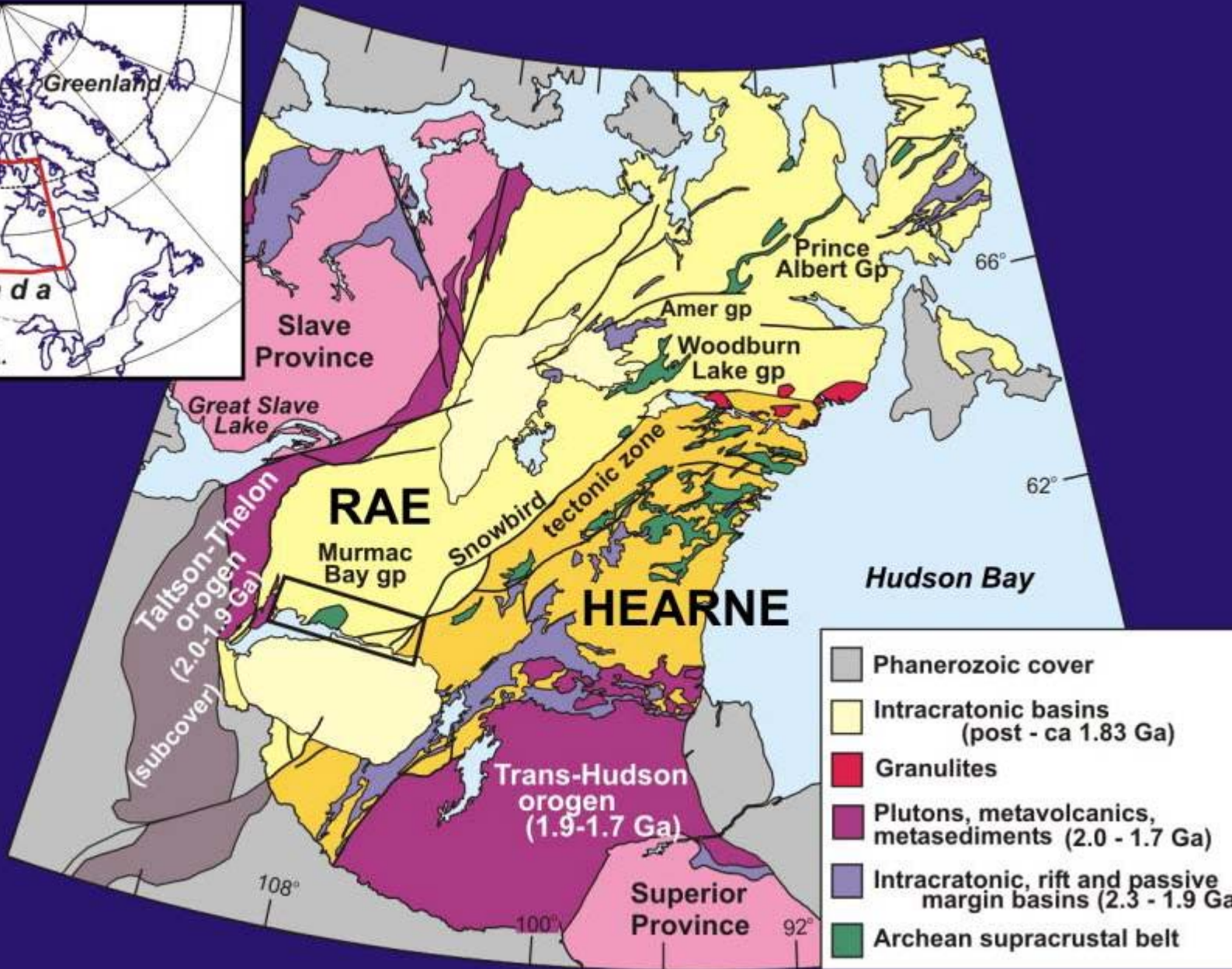


# The Rae Province in Saskatchewan

K.E. Ashton, C. Card, Saskatchewan Geological Survey;  
R. Hartlaub, L. Heaman, and R. Morelli, University of Alberta;  
K. Bethune, R. Hunter, and G. Niebergall, University of Regina

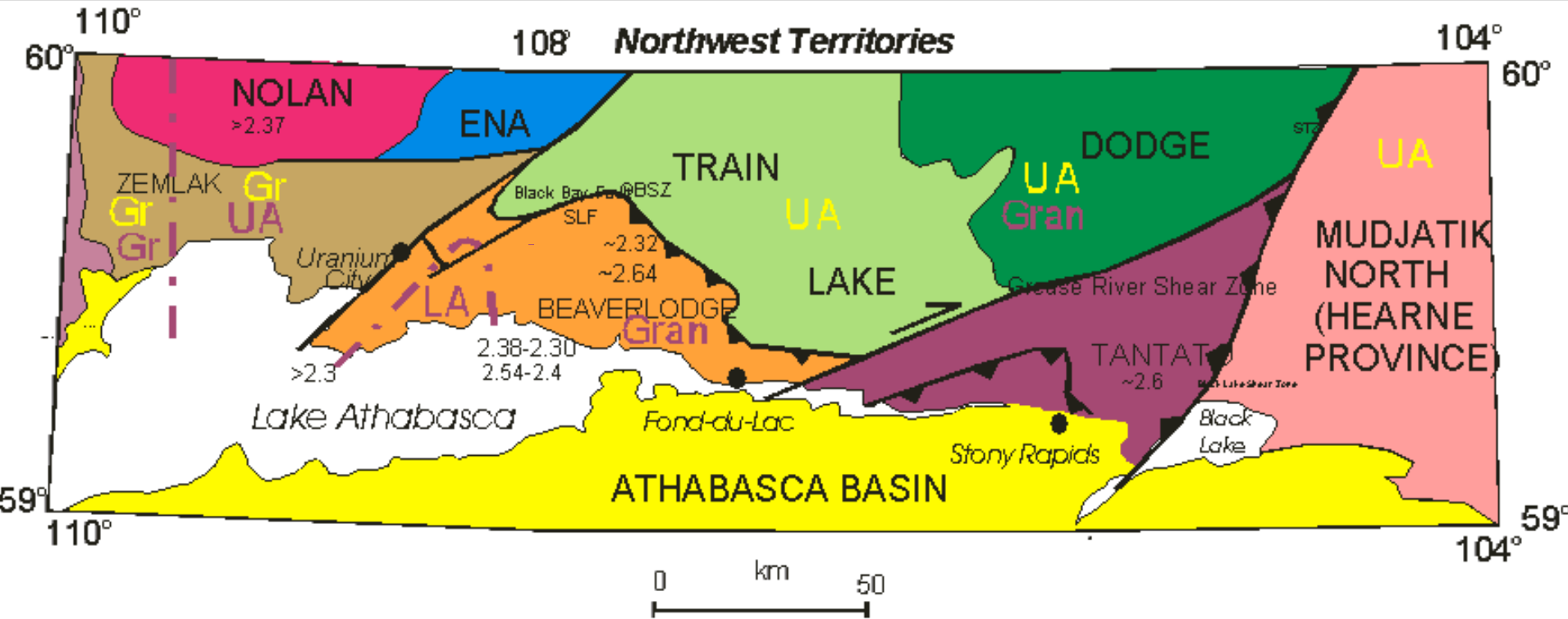


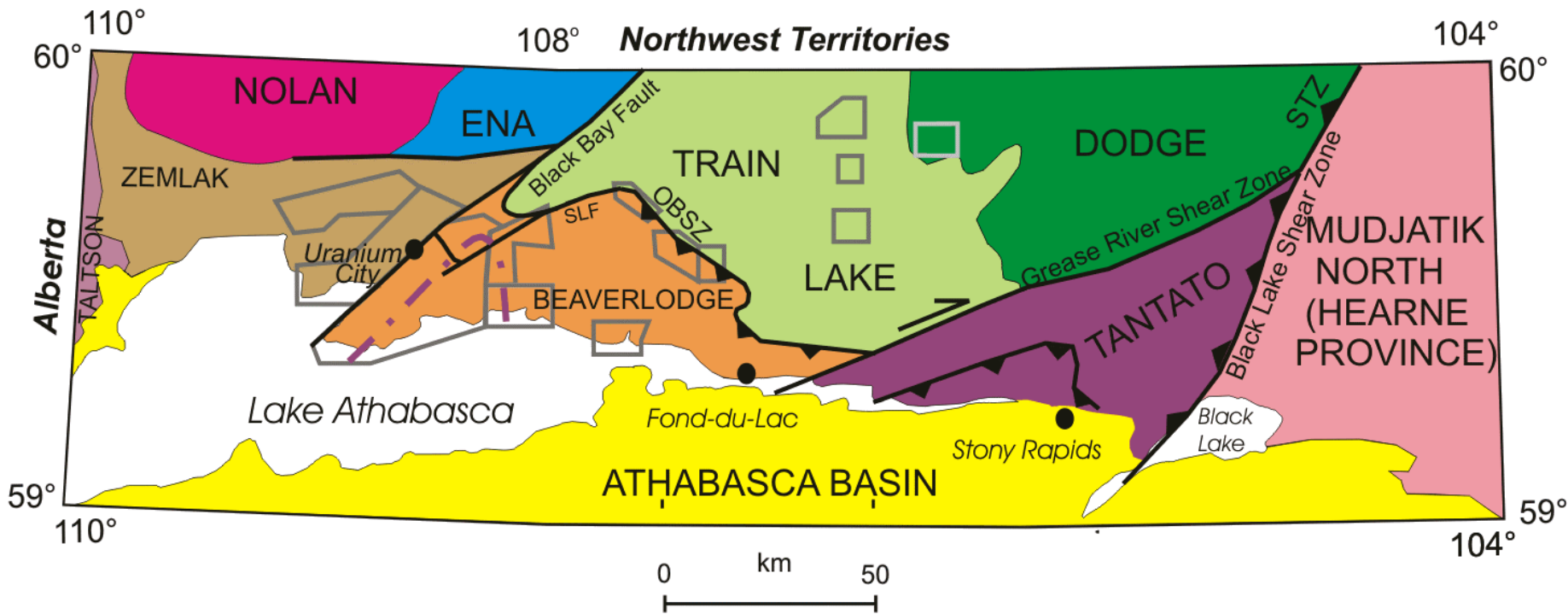


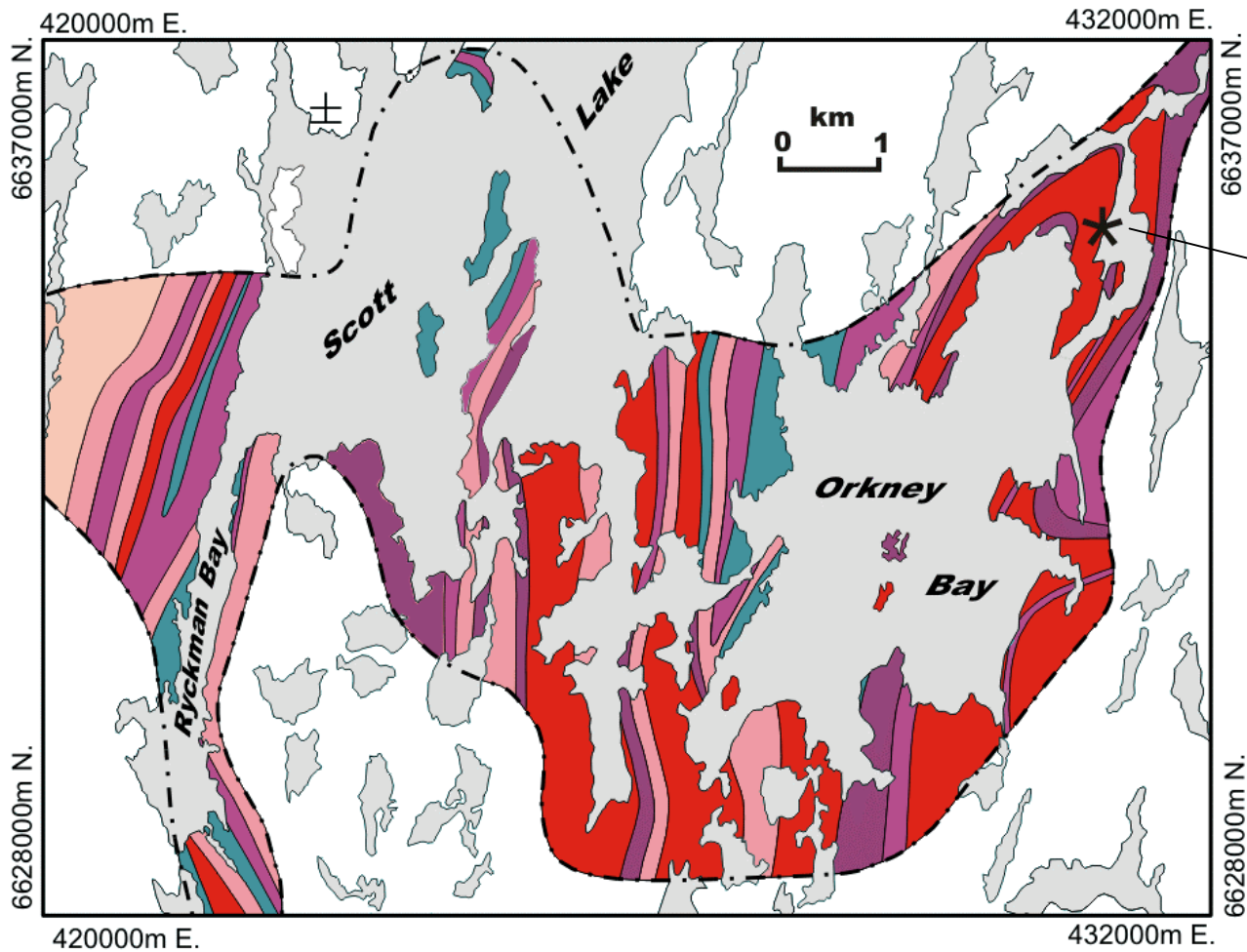
- Phanerozoic cover
- Intracratonic basins (post - ca 1.83 Ga)
- Granulites
- Plutons, metavolcanics, metasediments (2.0 - 1.7 Ga)
- Intracratonic, rift and passive margin basins (2.3 - 1.9 Ga)
- Archean supracrustal belt

# Metamorphism

1.82-1.80 Ga  
1.93-1.90 Ga  
>1.93 Ga







Granite

UI: 2678 +/-24

LI: 1935 +/-56

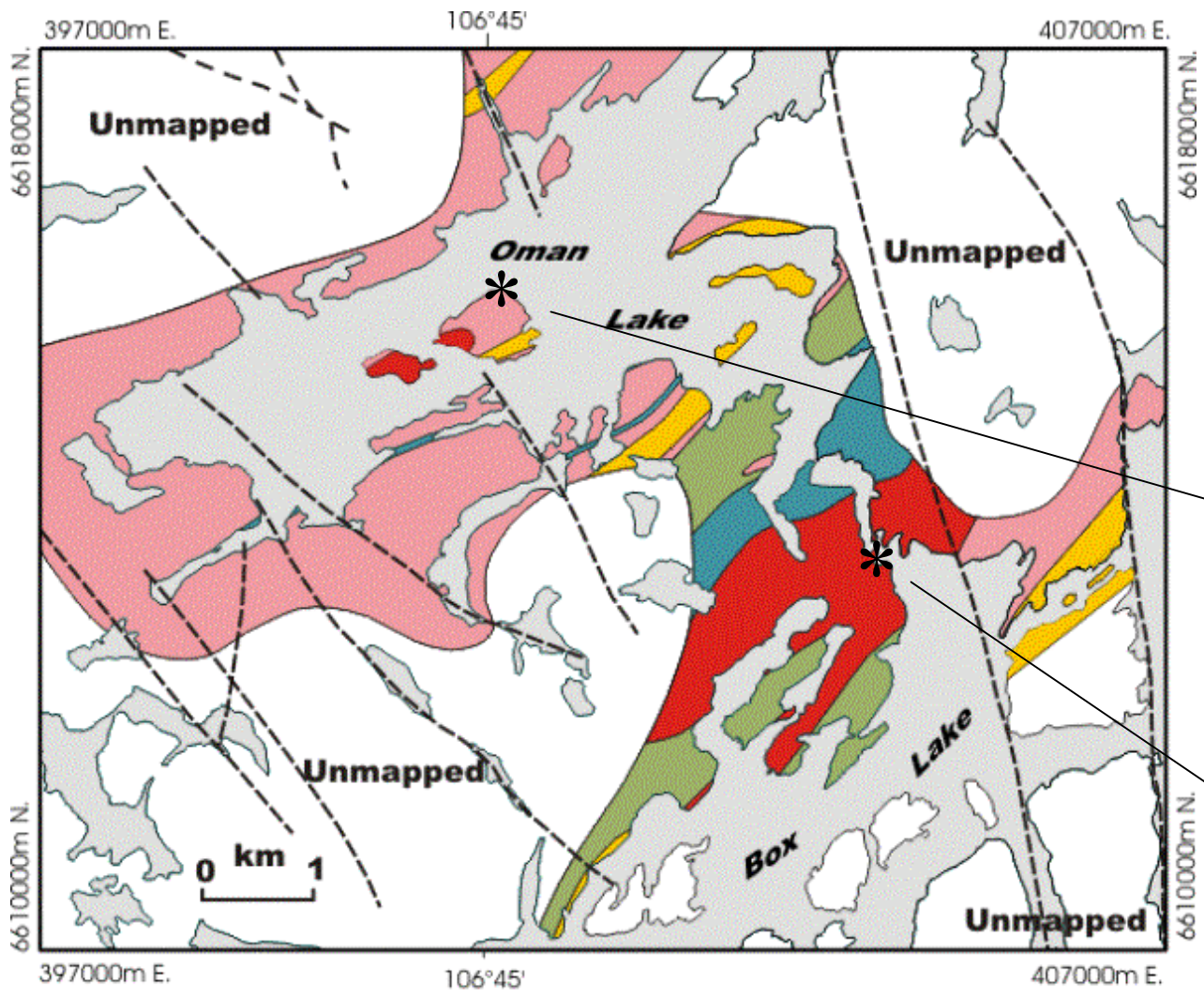
- |   |  |   |                       |
|---|--|---|-----------------------|
|  | <b>Pegmatitic granite</b>                  |  | <b>Gabbroic rocks</b> |
|  | <b>Leucogranodioritic-tonalitic gneiss</b> |  | <b>Dioritic rocks</b> |
|  | <b>Granodiorite</b>                        |  | <b>Pyribolite</b>     |

 **Limit of mapping**



Saskatchewan  
Industry and  
Resources





Massive  
Leucogranite  
UI 1815 +/-4

Migmatitic  
Leucotonalite  
UI 2538 +/-22  
LI 909 +/-550

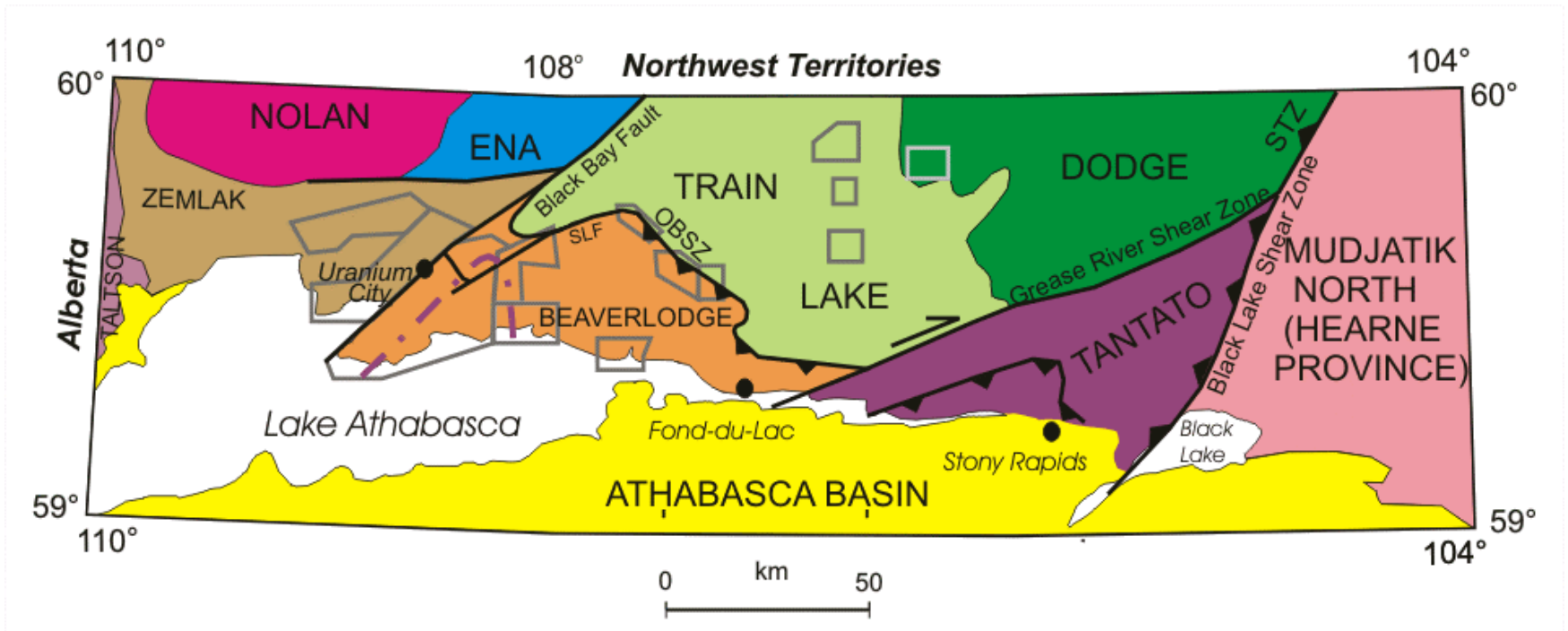
Quartz  
Monzodiorite  
UI 2575 +/-15  
LI 1828 +/-19

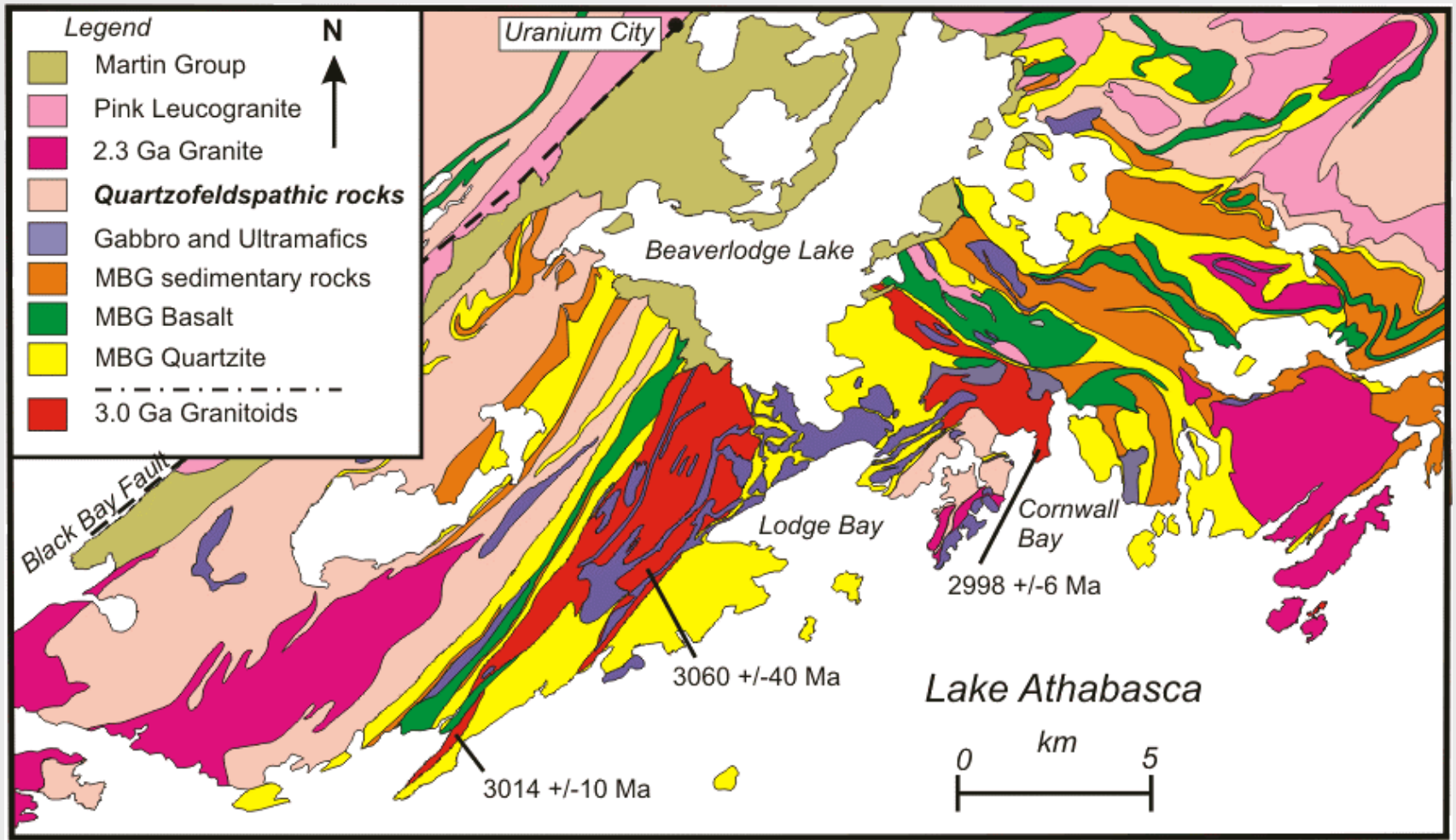
- Migmatitic leucogranodiorite
- Granodiorite-tonalite
- Pelitic paragneiss, migmatite
- Heterogeneous intermediate gneiss
- Amphibolite
- Fault/lineament



Saskatchewan  
Industry and  
Resources





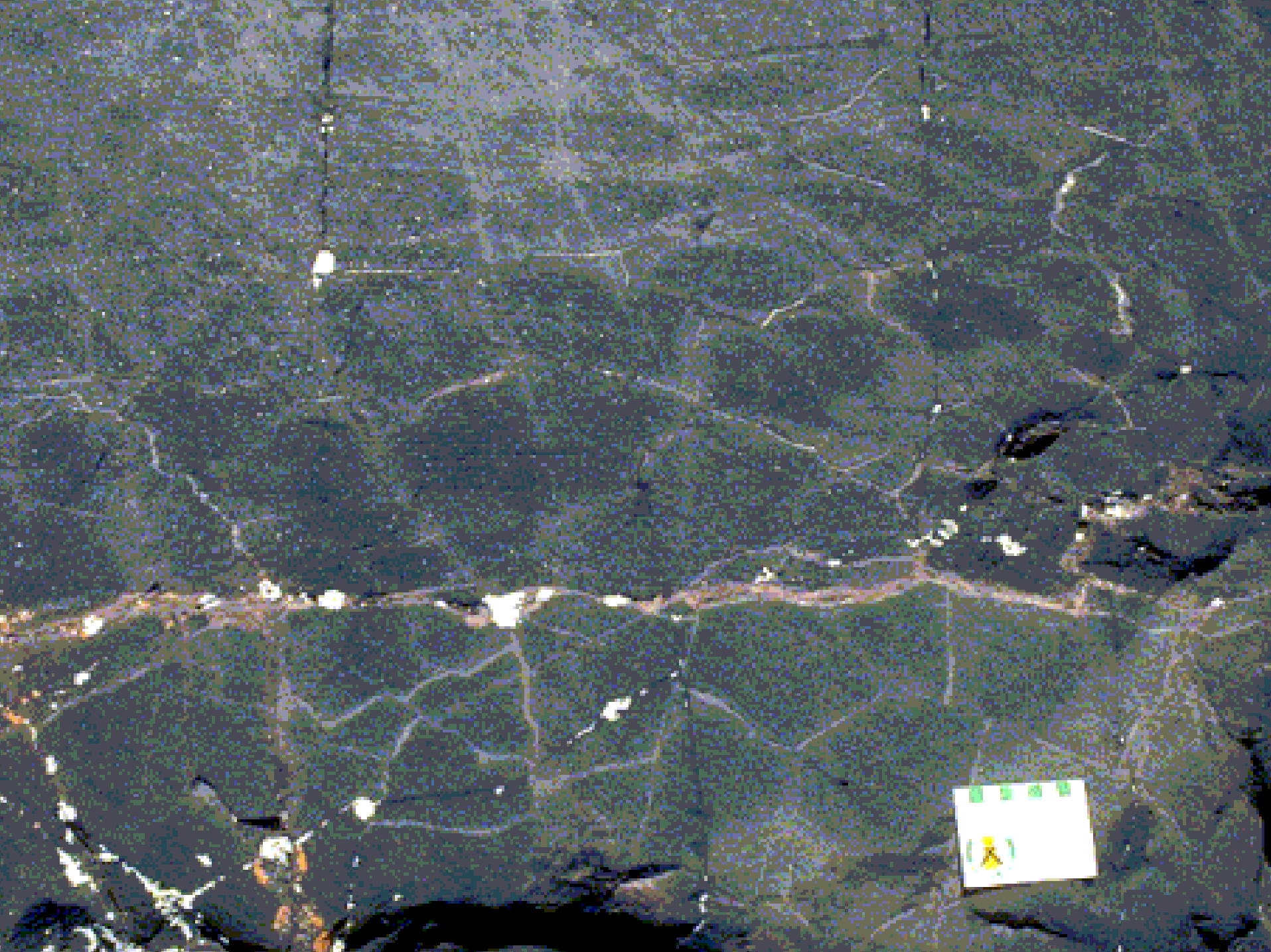


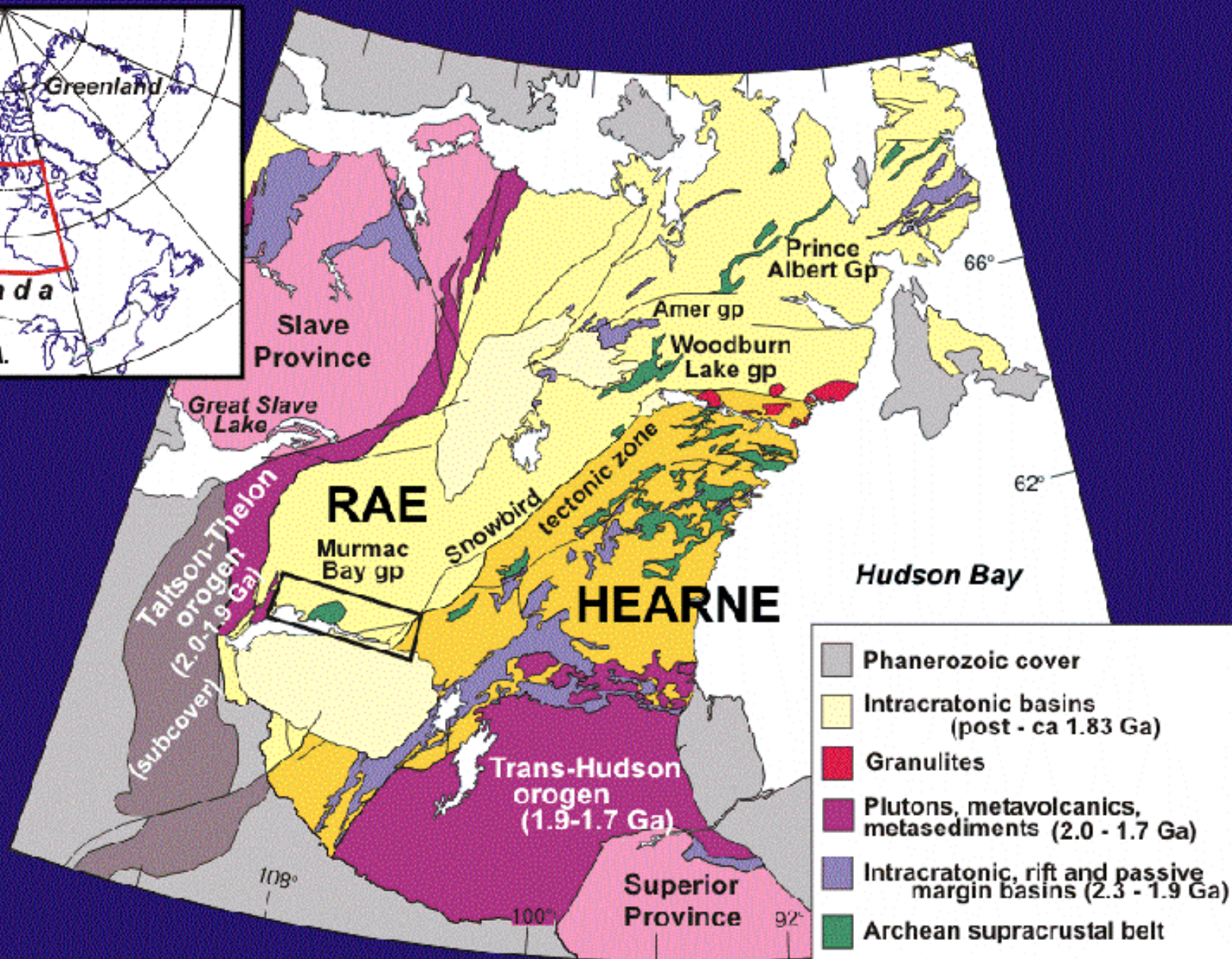










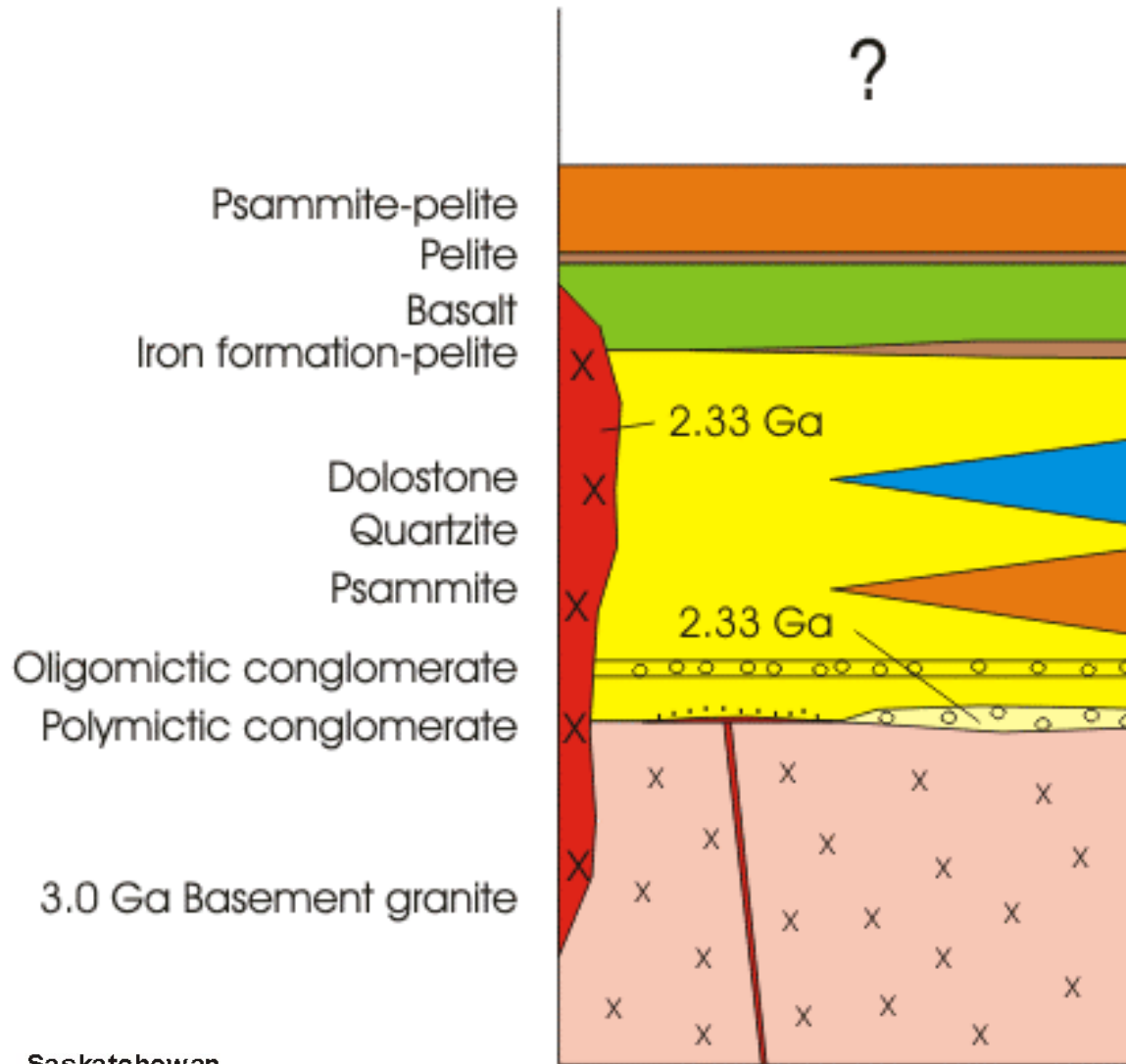


- Phanerozoic cover
- Intracratonic basins (post - ca 1.83 Ga)
- Granulites
- Plutons, metavolcanics, metasediments (2.0 - 1.7 Ga)
- Intracratonic, rift and passive margin basins (2.3 - 1.9 Ga)
- Archean supracrustal belt



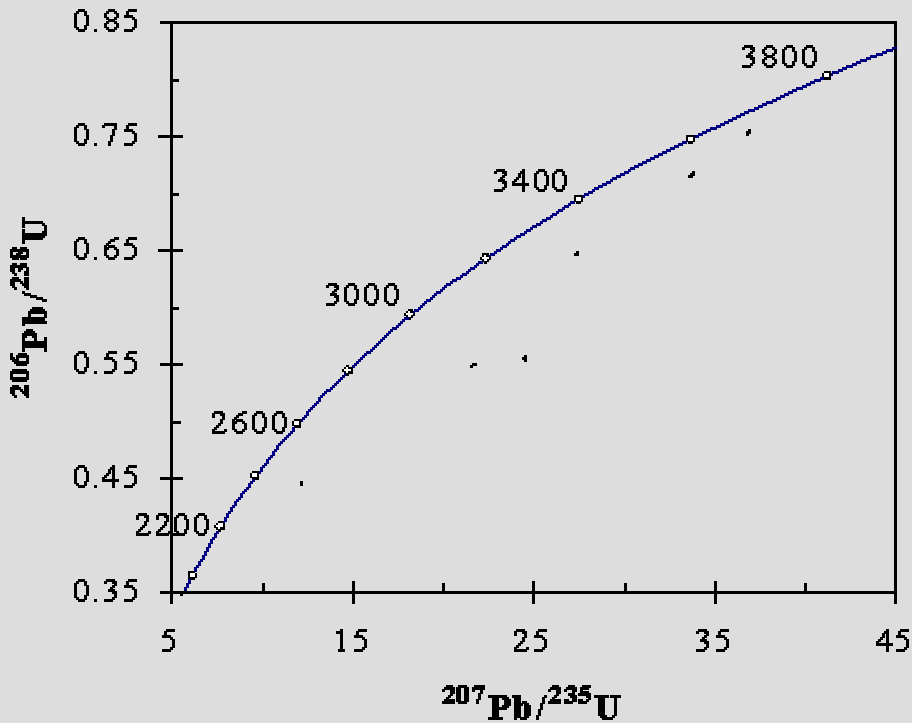
Volcaniclastic: Ca 2.33 Ga

# Murmac Bay Group



Age, at least in part, is  
ca. 2.33 Ga

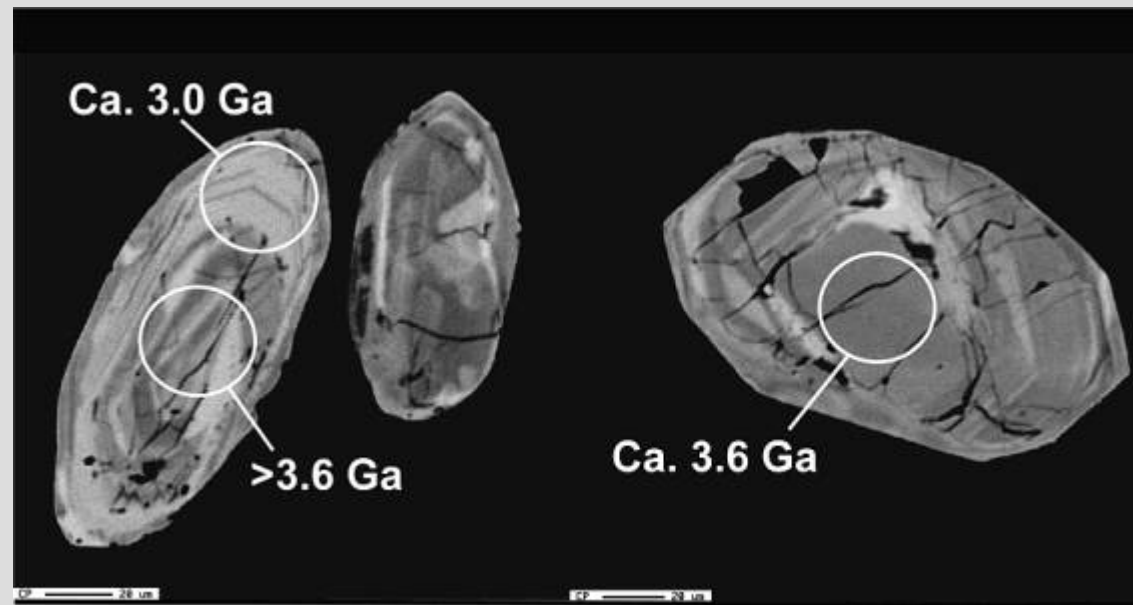




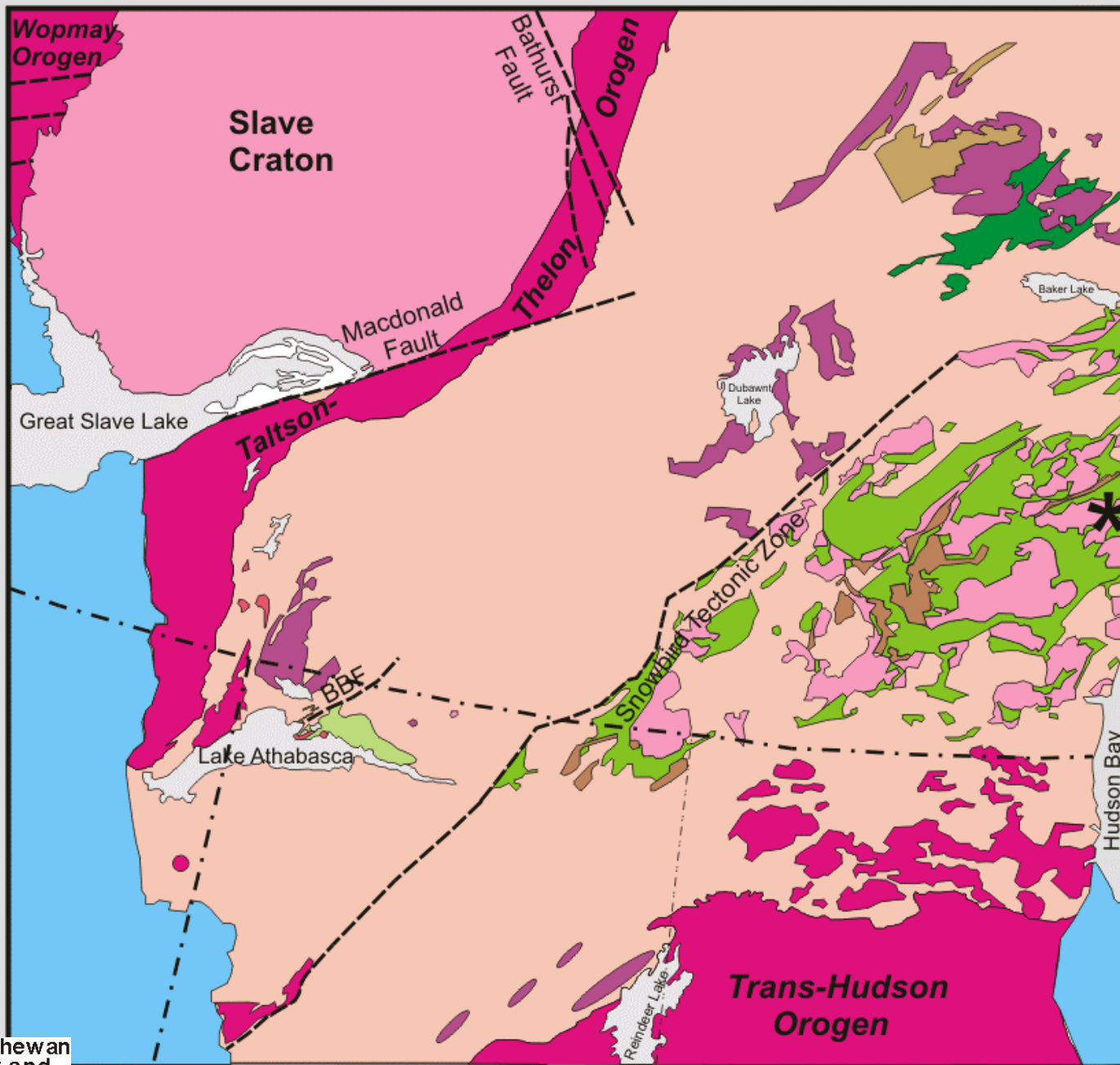
## Paleoarchean Basement?

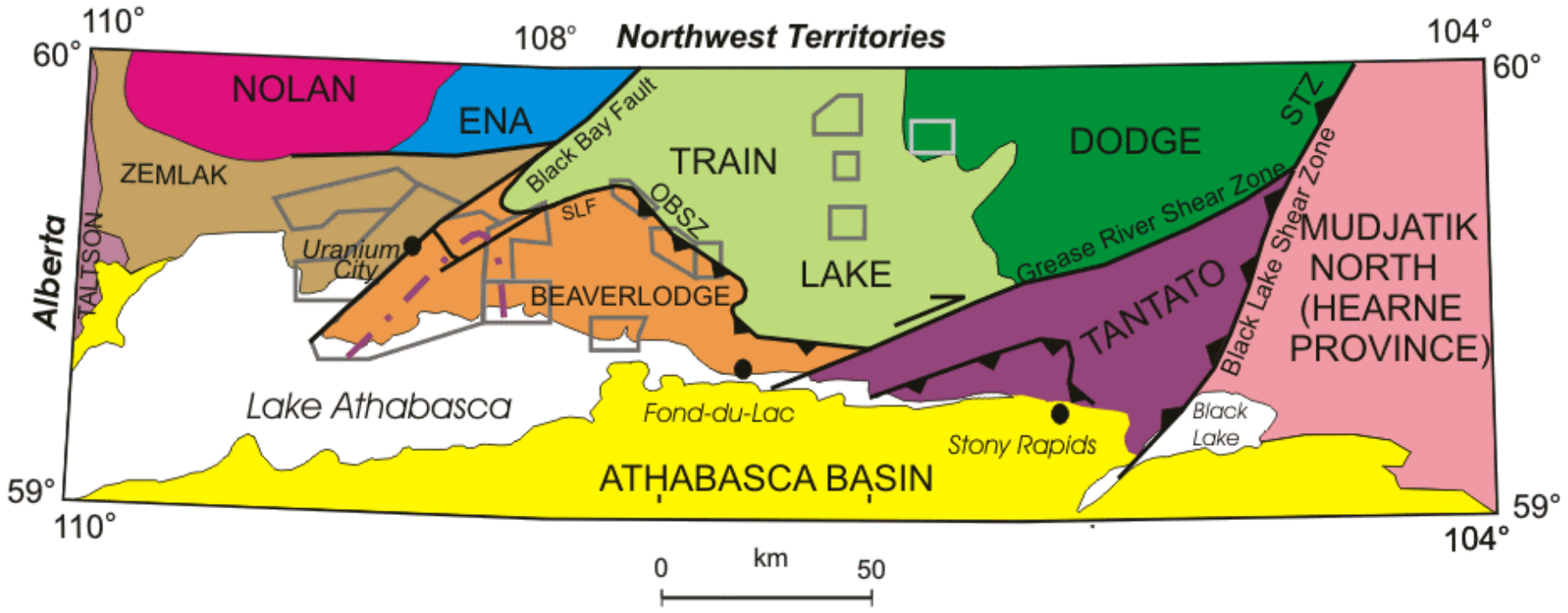
Detrital zircons from  
Murmac Bay Group  
quartzite

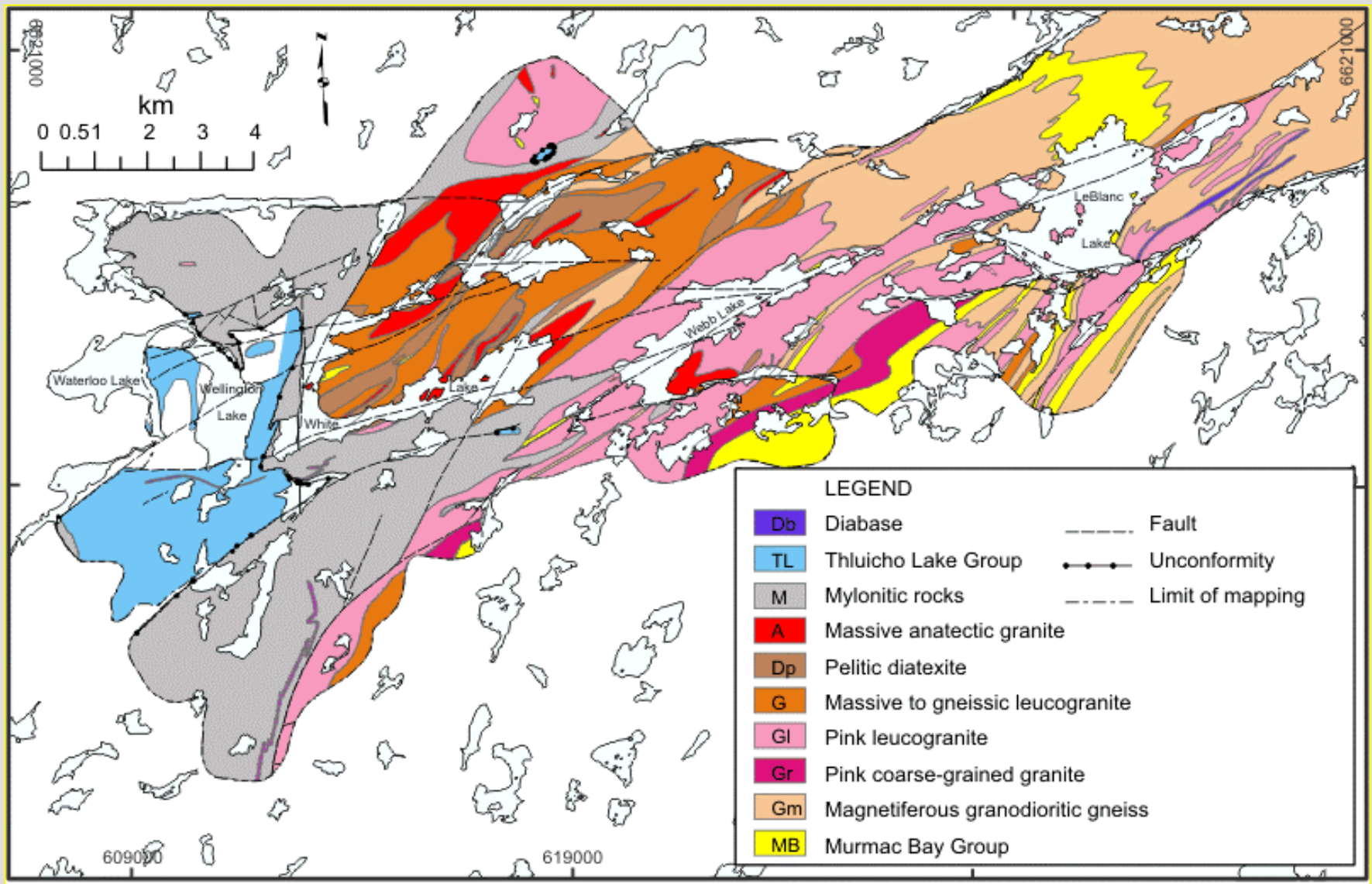
Inherited zircons  
from ca. 1900  
Ma leucogranite

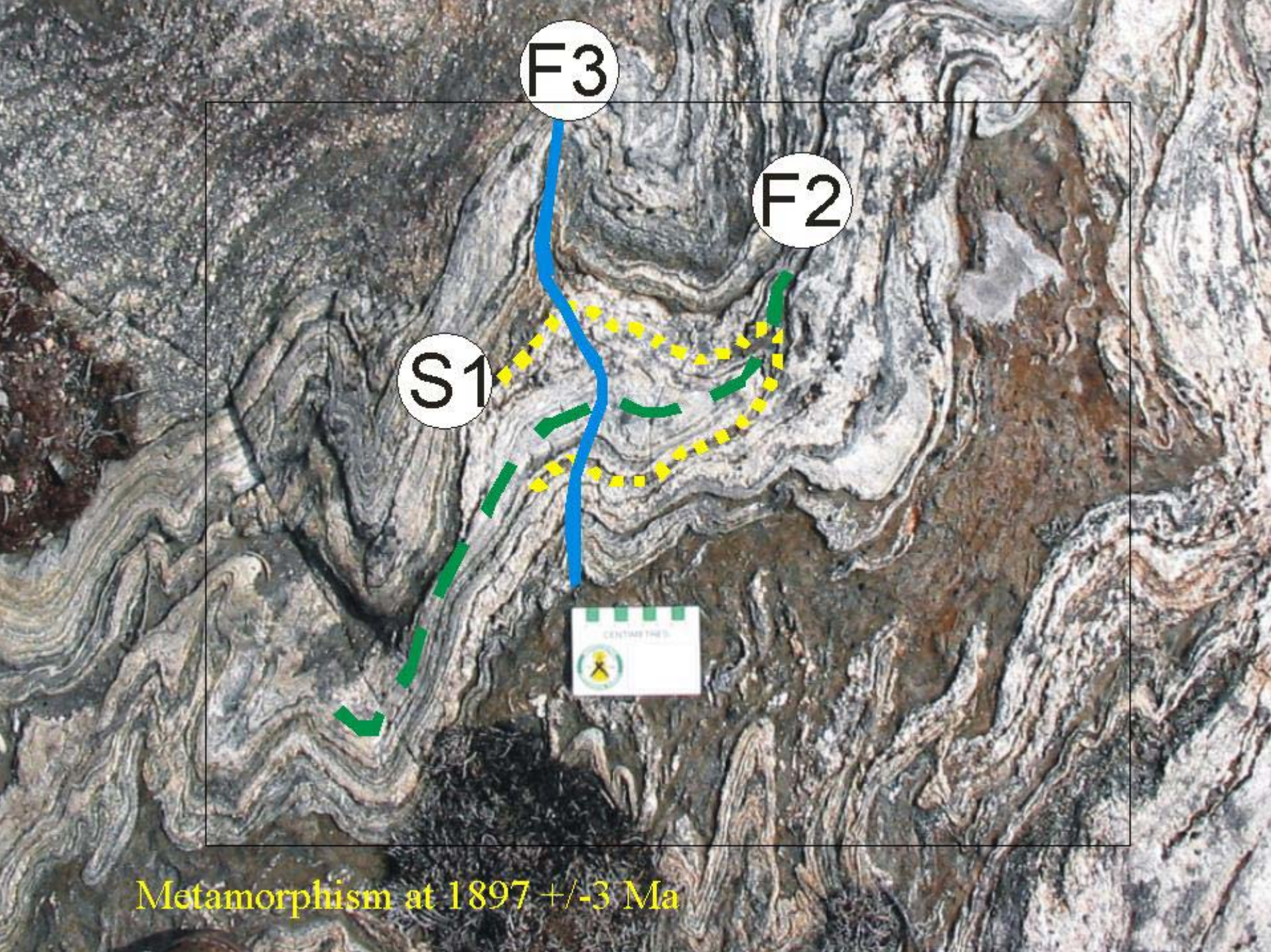












F3

F2

S1

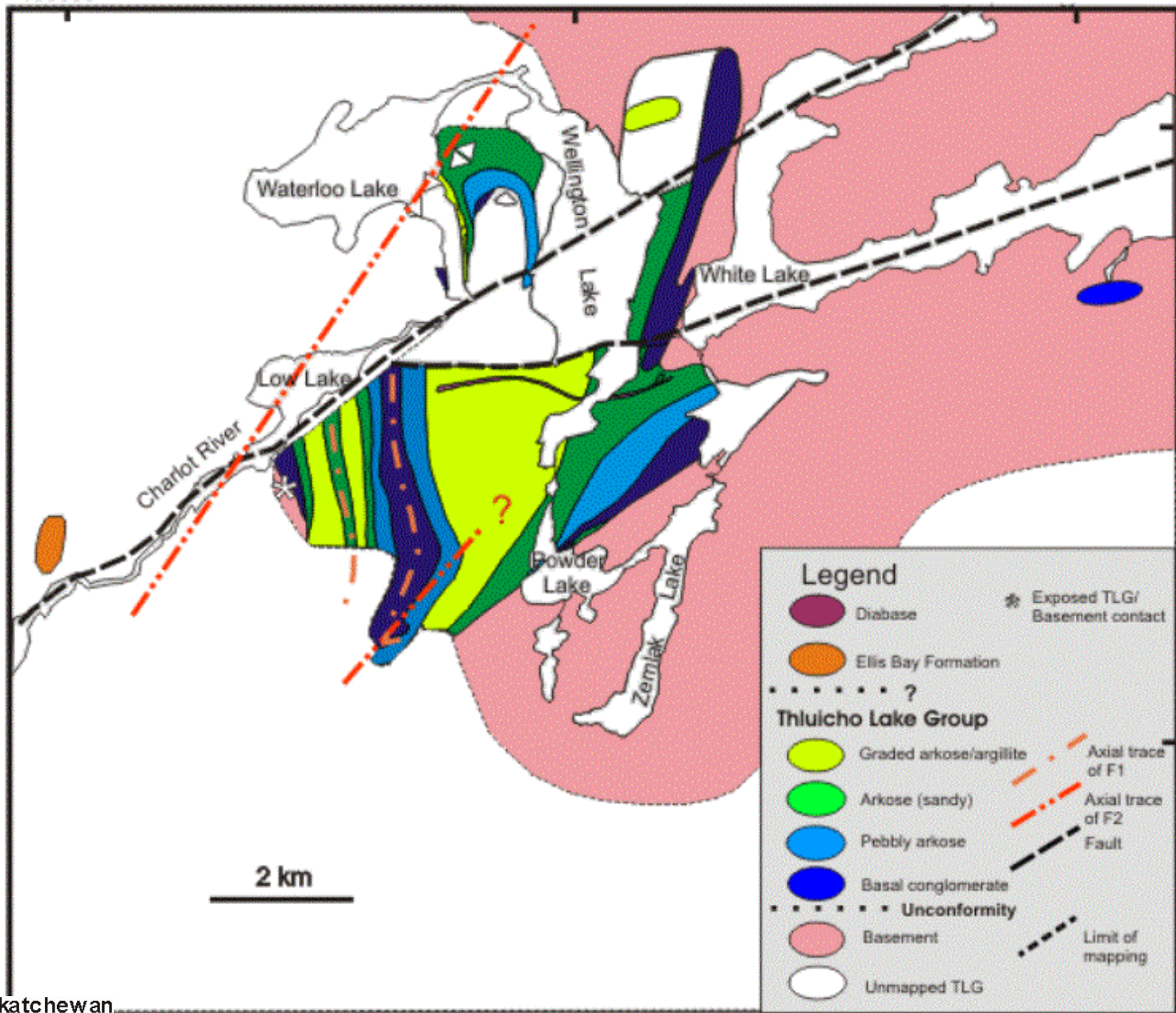


Metamorphism at  $1897 \pm 3$  Ma

605000m. E.

611000

617000



6614000m. N.

6607000

2 km

### Legend

- Diabase
- Ellis Bay Formation
- ?
- Thlucho Lake Group**
- Graded arkose/argillite
- Arkose (sandy)
- Pebbly arkose
- Basal conglomerate
- Unconformity
- Basement
- Unmapped TLG
- Exposed TLG/  
Basement contact
- Axial trace  
of F1
- Axial trace  
of F2
- Fault
- Limit of  
mapping

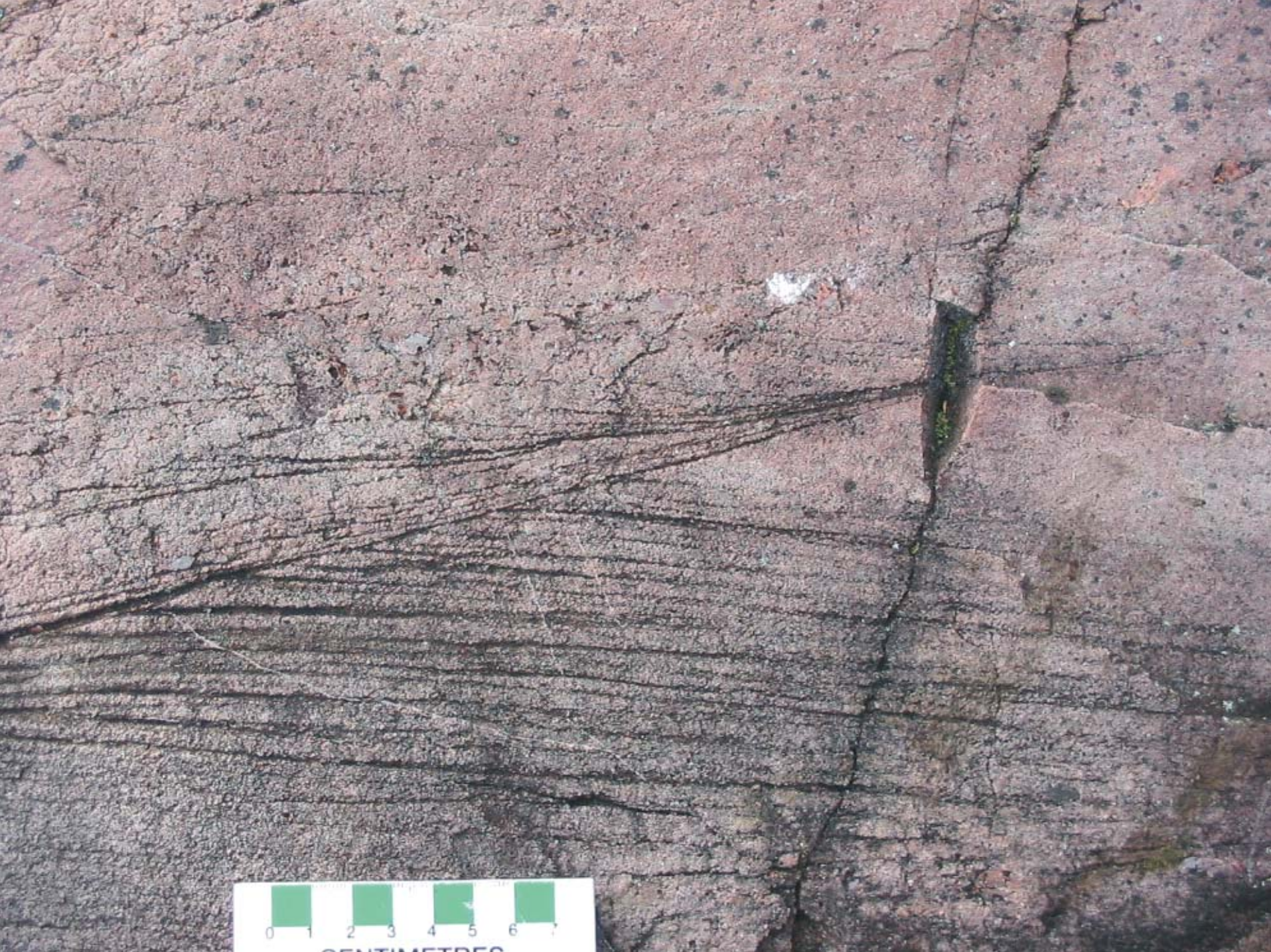


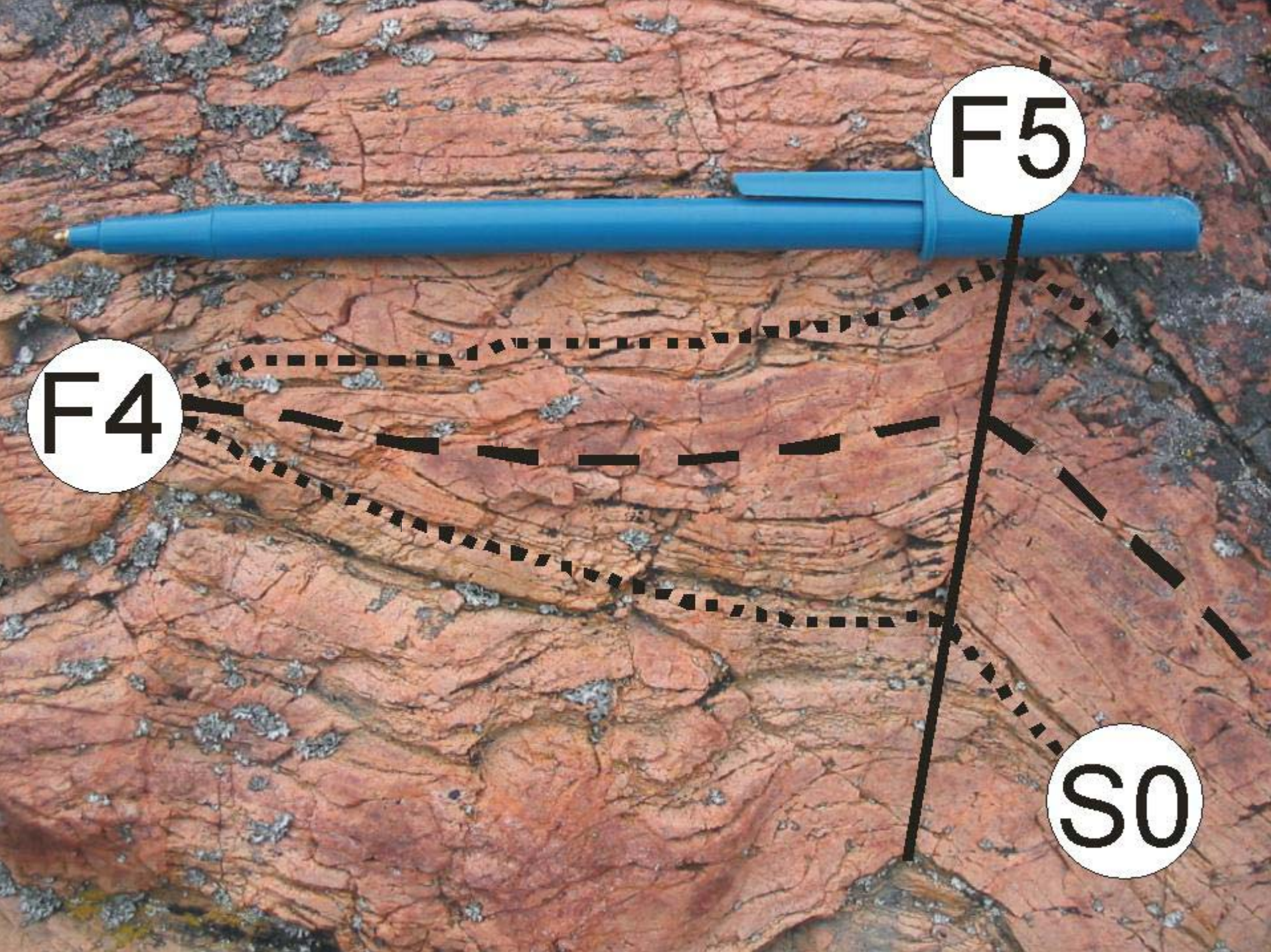
Saskatchewan  
Industry and  
Resources



19 48







F4

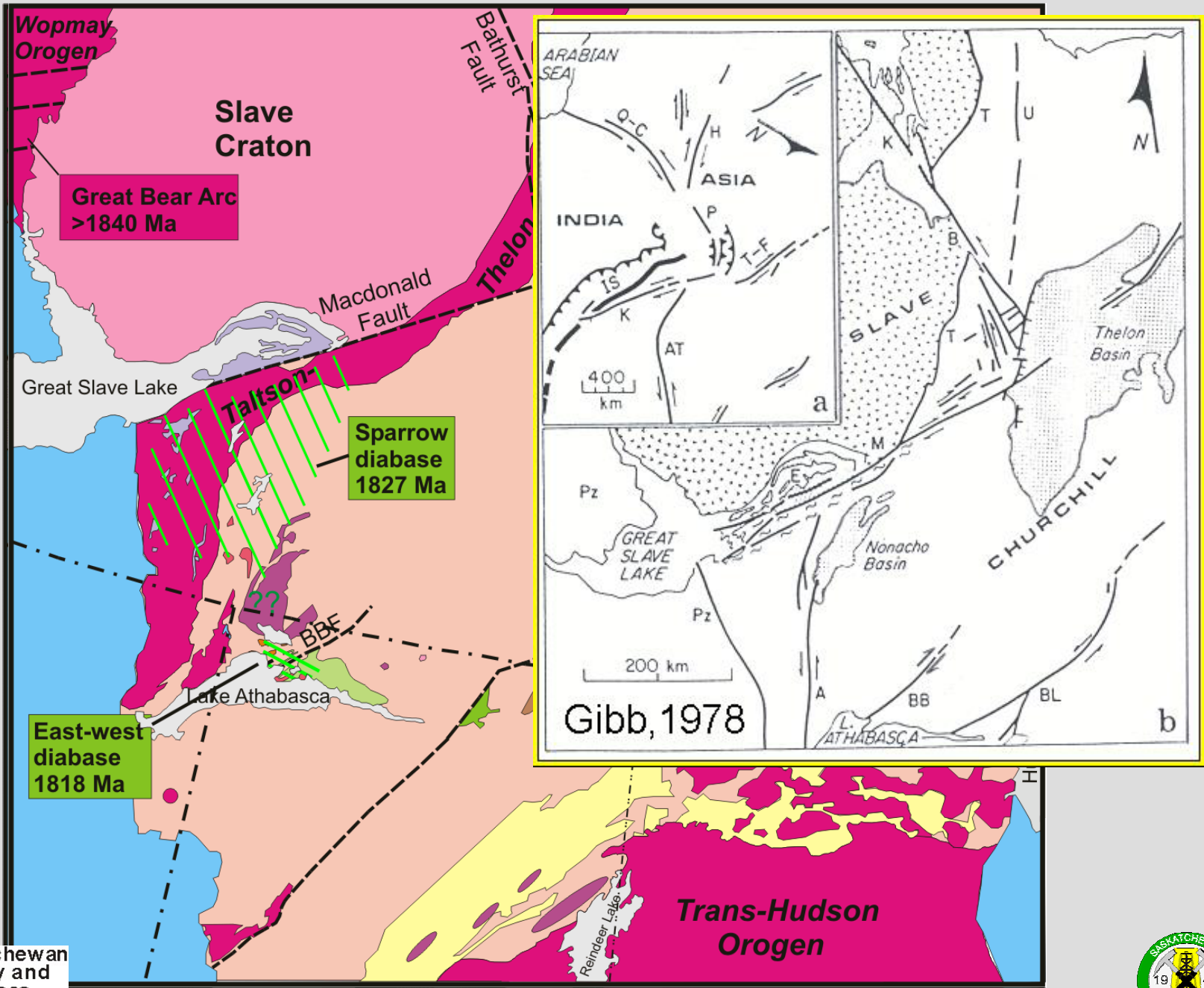
F5

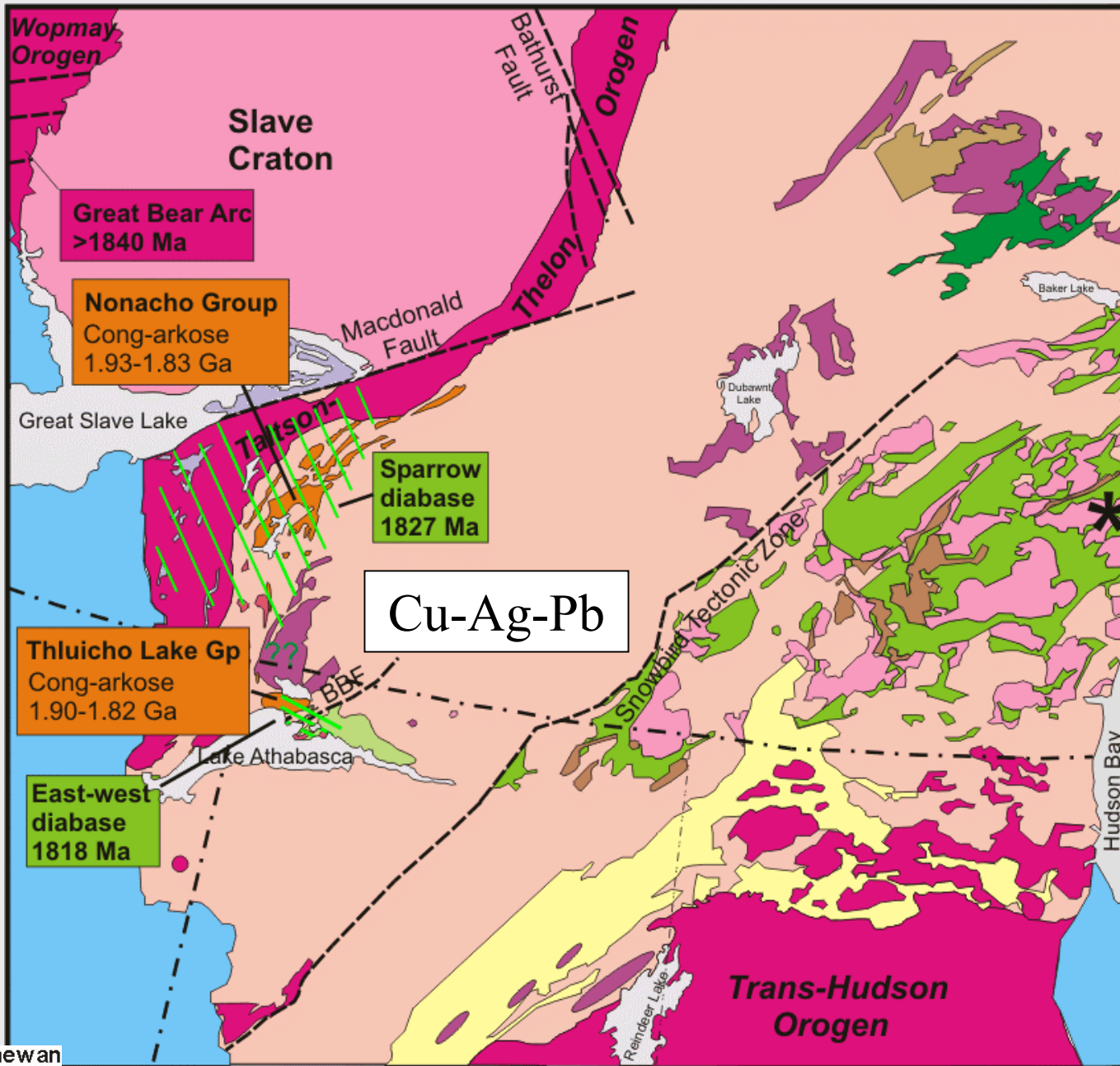
S0

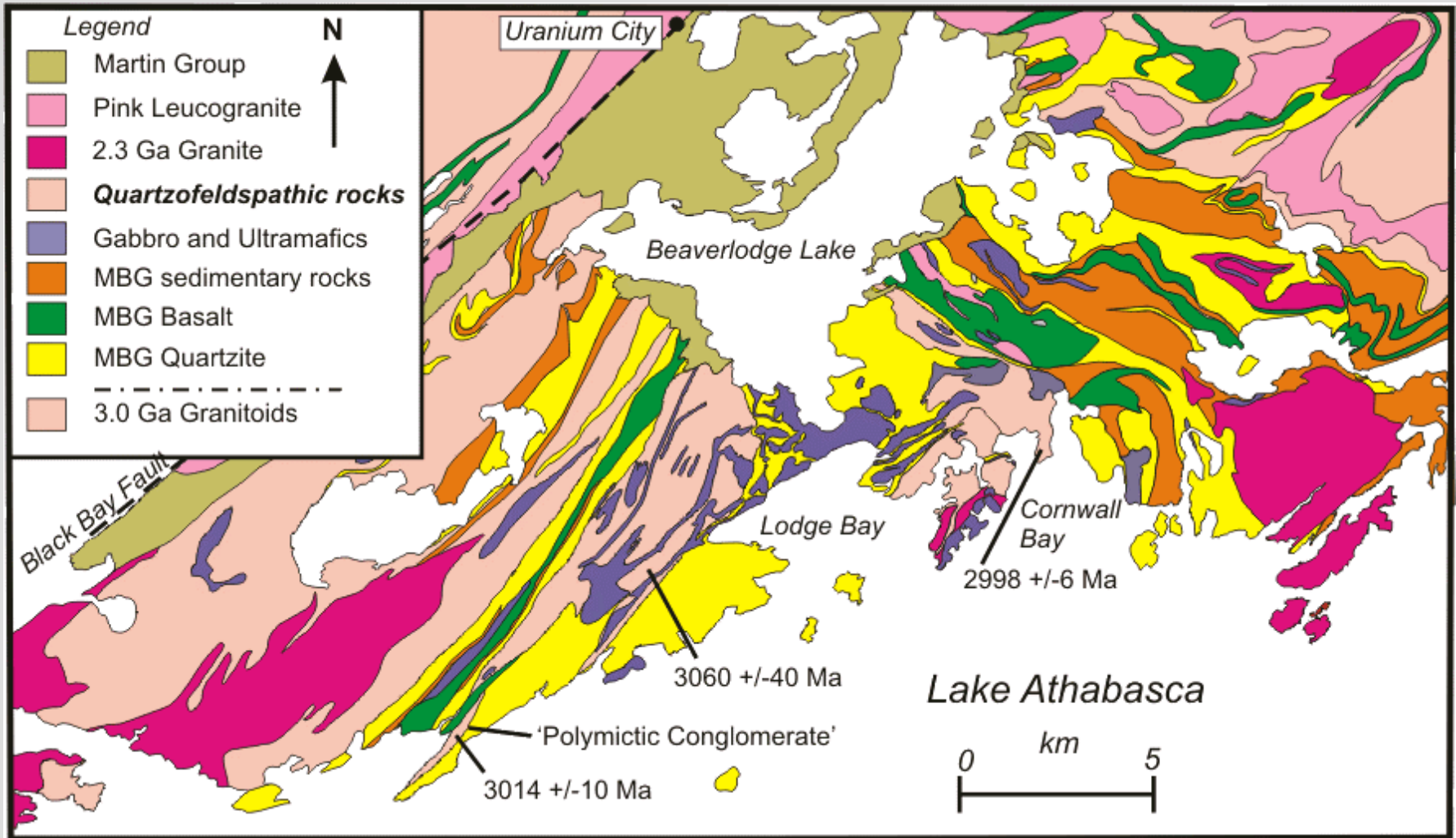




Ca. 1818 Ma mafic dyke











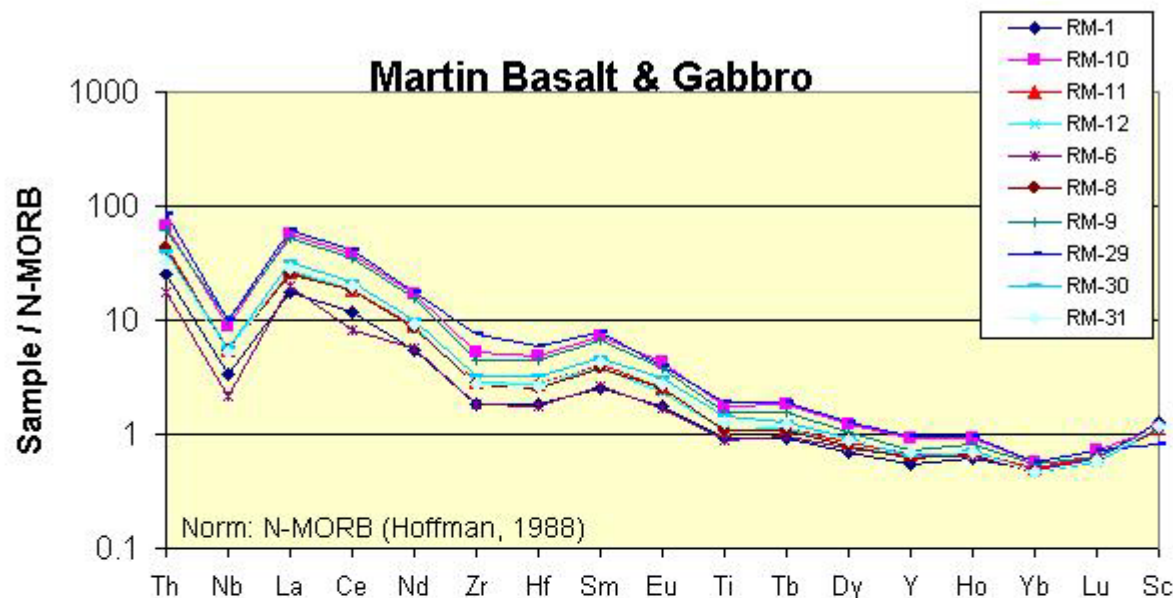


1818 Ma Diabase

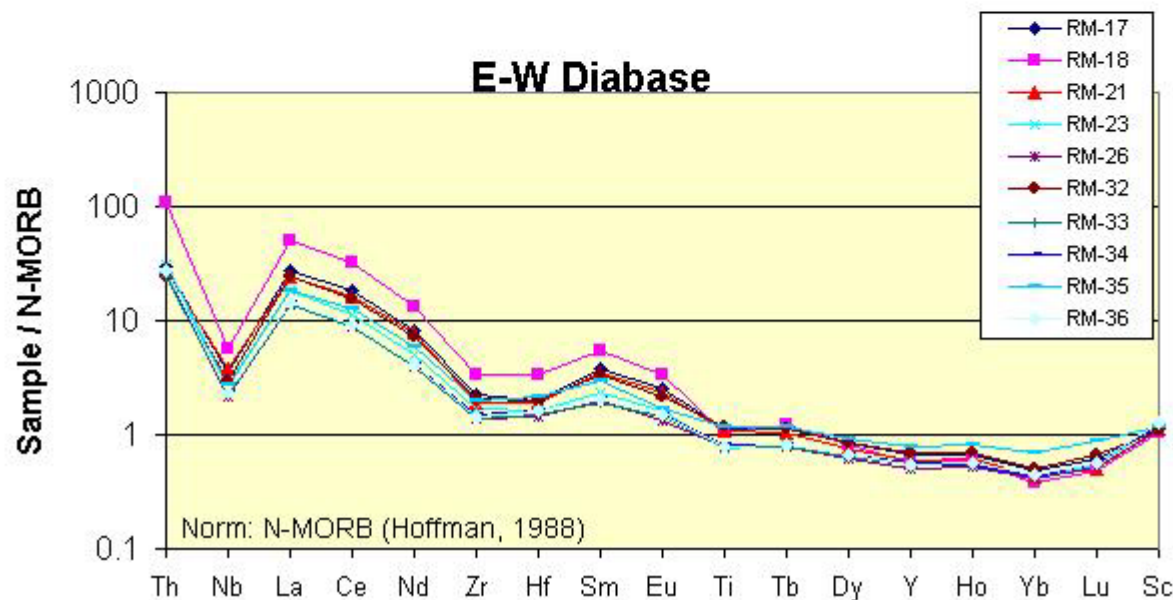


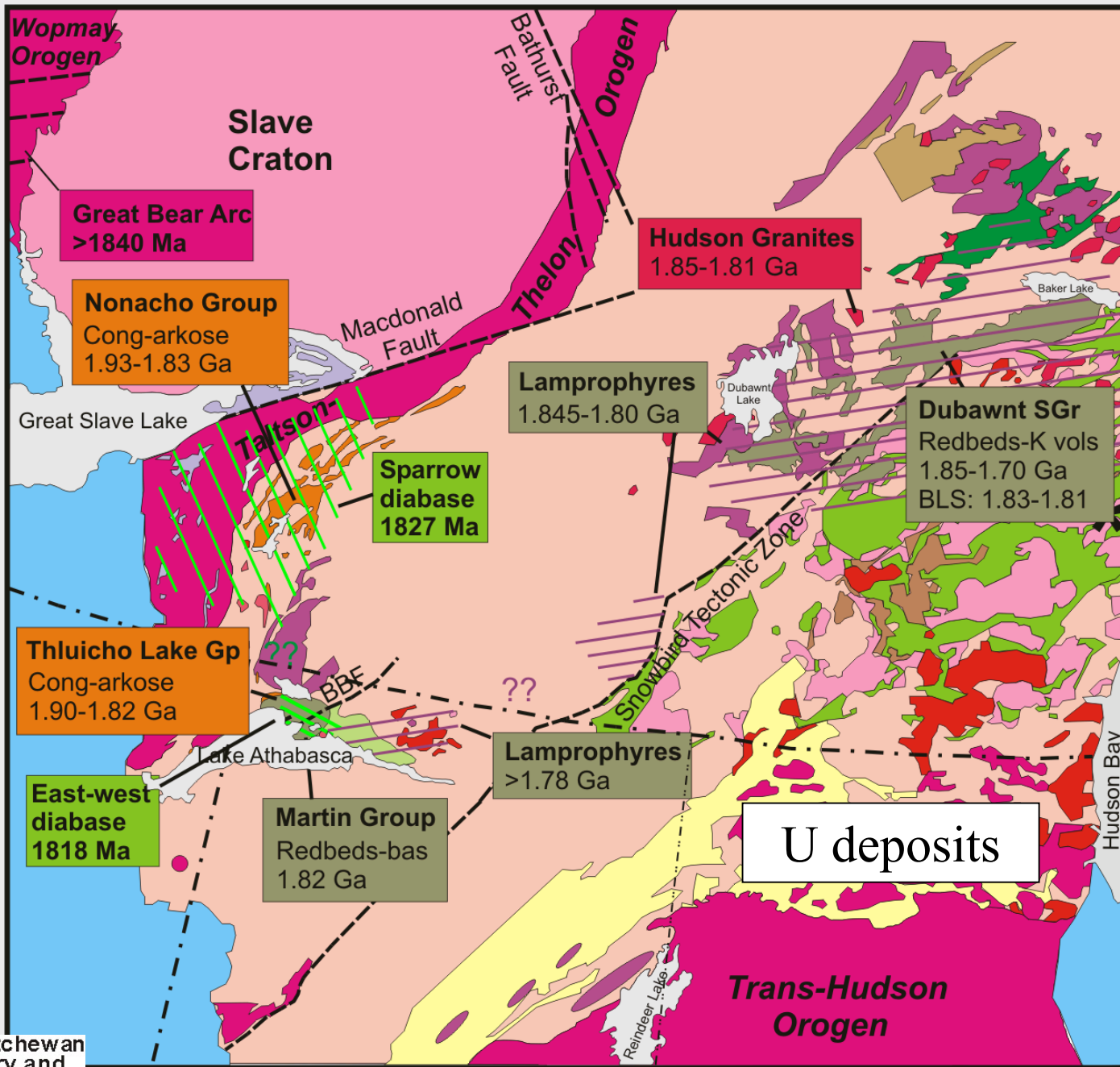


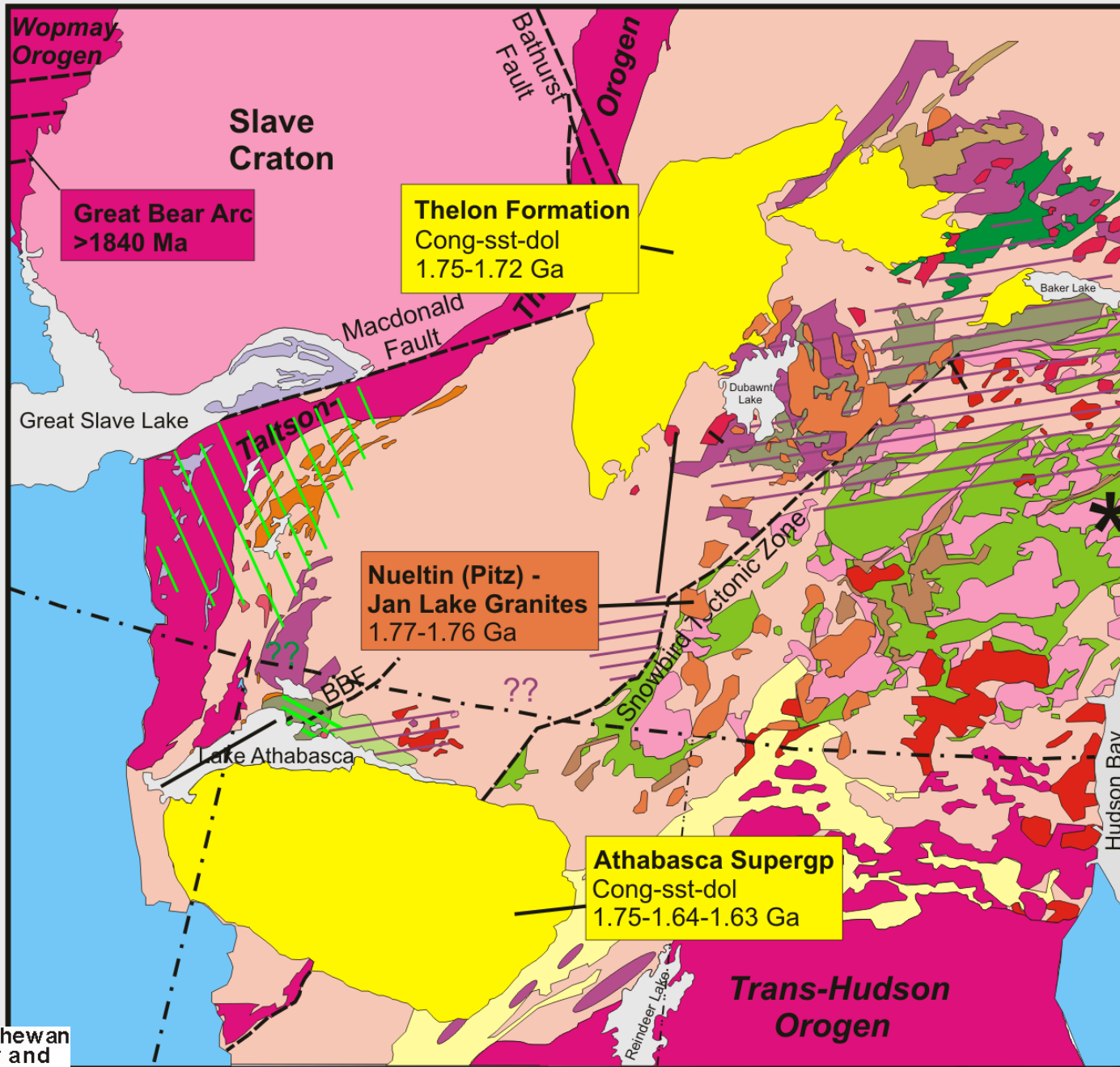
1818 Ma Diabase



Martin Group was being deposited at 1820 Ma







# Conclusions

- At least part of the Murmac Bay Group was deposited ca. 2330 Ma with bimodal basalt & granite-porphyry suite
- Thluicho Lake Group deposited between 1900 and 1820 Ma; may be correlative with Nonacho Group → molasse from uplifting Taltson MZ
- Near-continuous terrane accretion between 1850 and 1830 Ma resulted in vise-like stress regime for Rae-Hearne Craton → Slave indentation
- Resulting widespread brittle deformation led to deposition of Martin Group and Baker Lake sequence in trans-tensional basins; also provided conduits for 1.83-1.81 Ga diabase and lamprophyre-granite suites
- Post-vise extension produced ca. 1760 Ma felsic post-orogenic magmatism and widespread subsidence → Thelon-Athabasca succession

