

Southwestern Margin of the Rae Province: A Data Synthesis

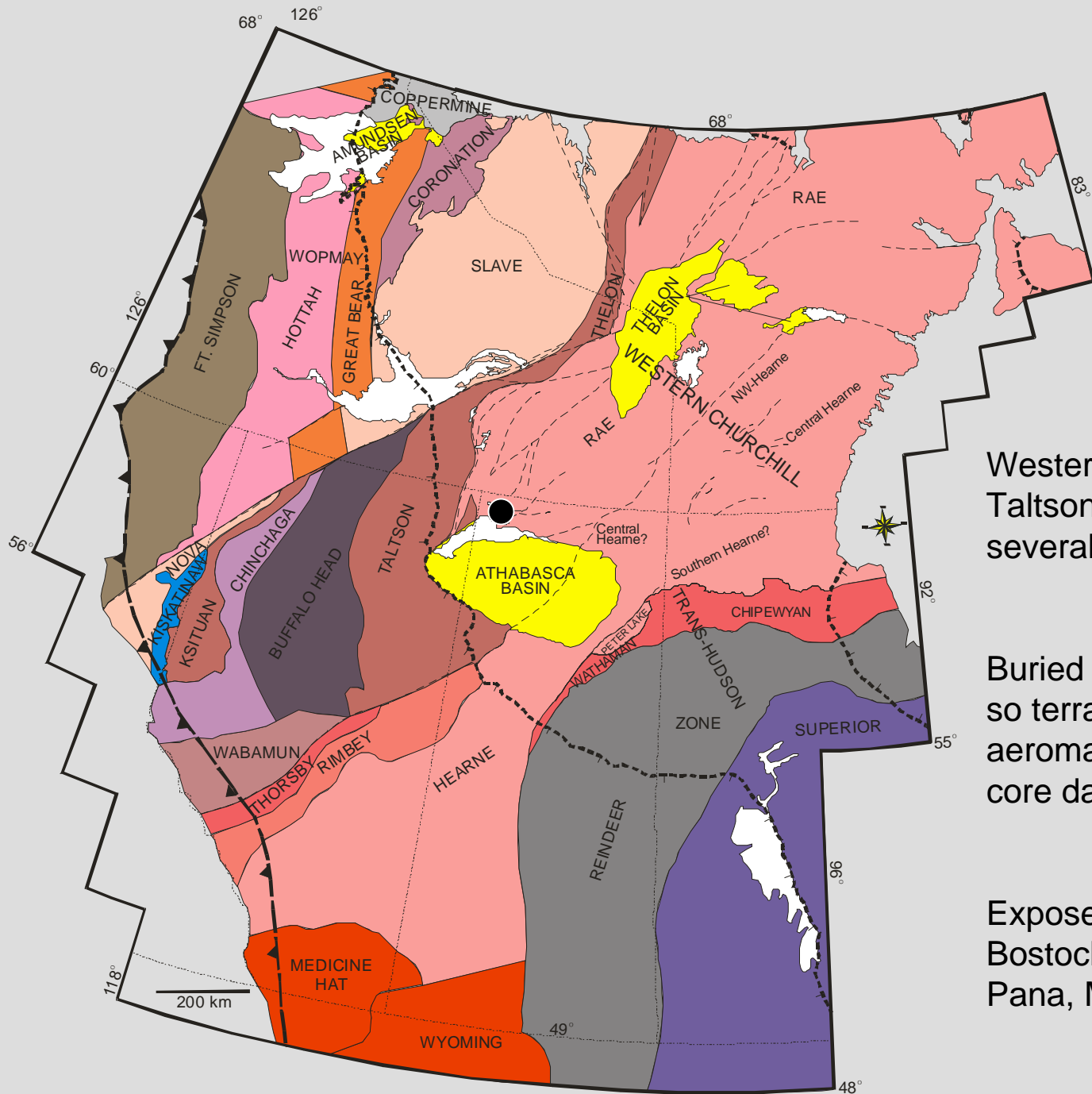
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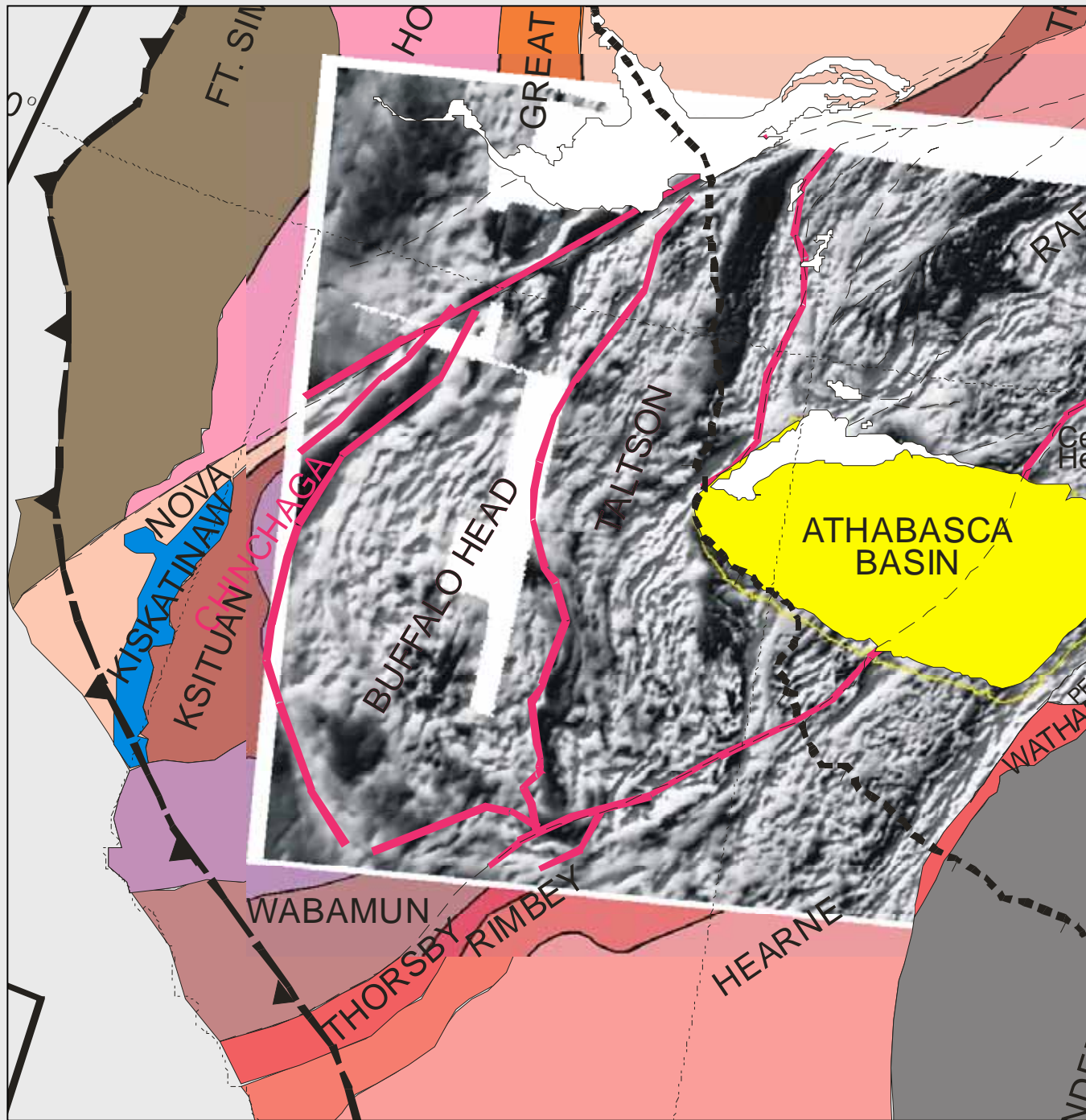
SUCCESS
INNOVATION



Western margin flanked by Taltson Magmatic Zone and several exotic? terranes

Buried under Phanerozoic cover, so terranes based on aeromagnetic signature and drill core data (Ross, Villeneuve)

Exposed margin known from Bostock, van Breemen, Berman, Pana, McDonough, McNicoll

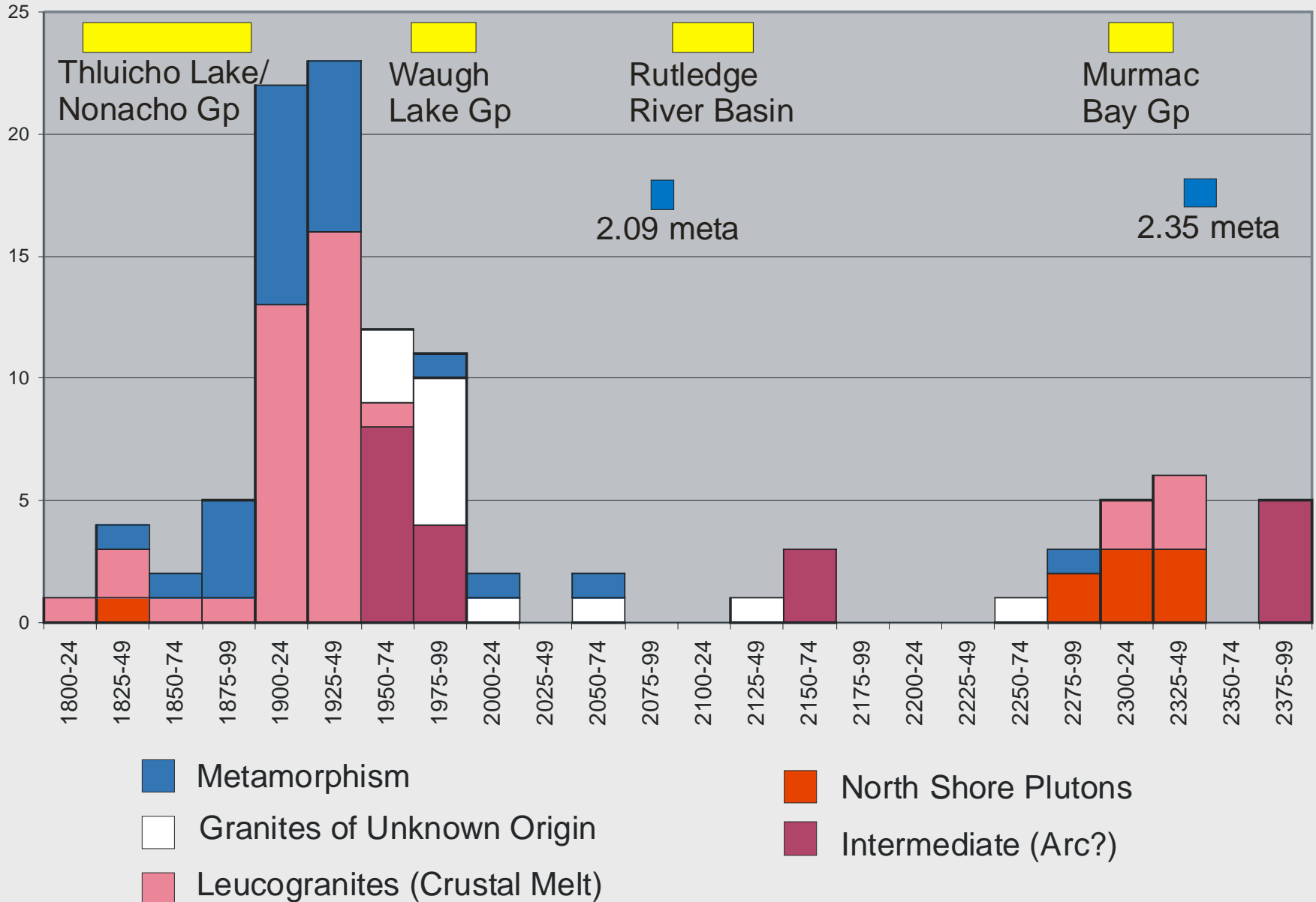


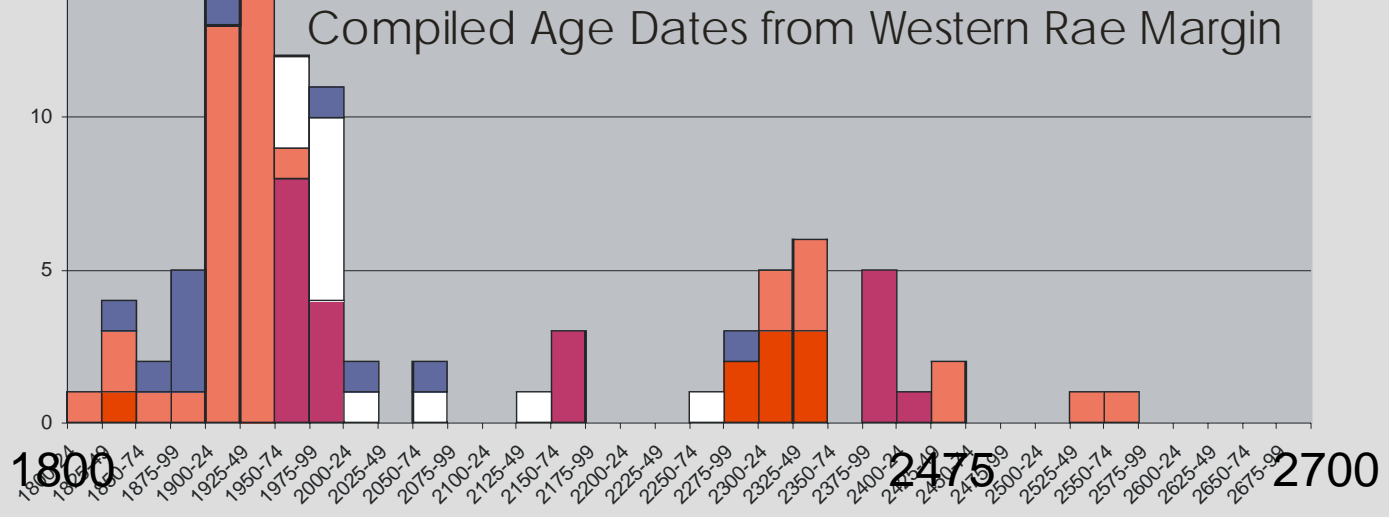
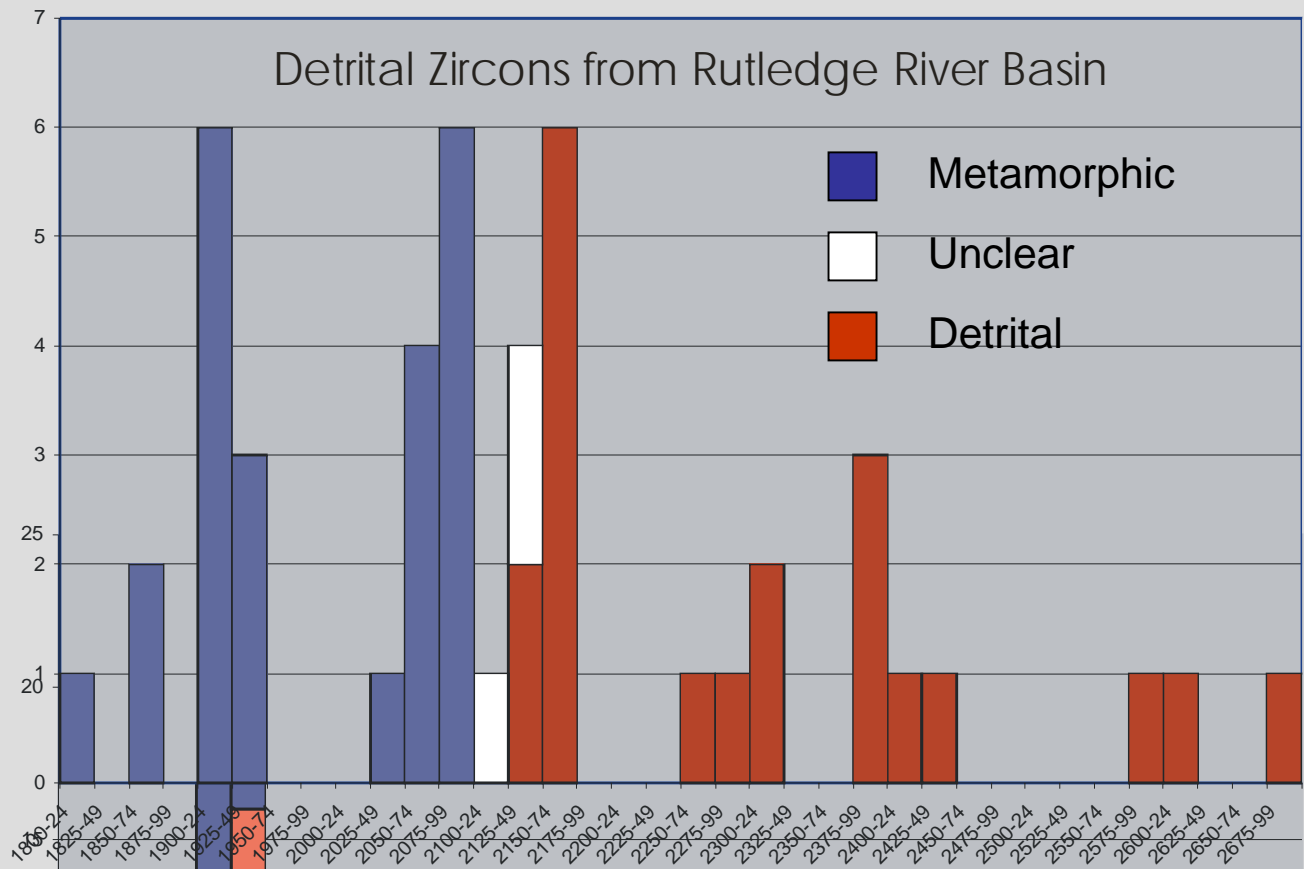
Most of this area buried under Phanerozoic cover

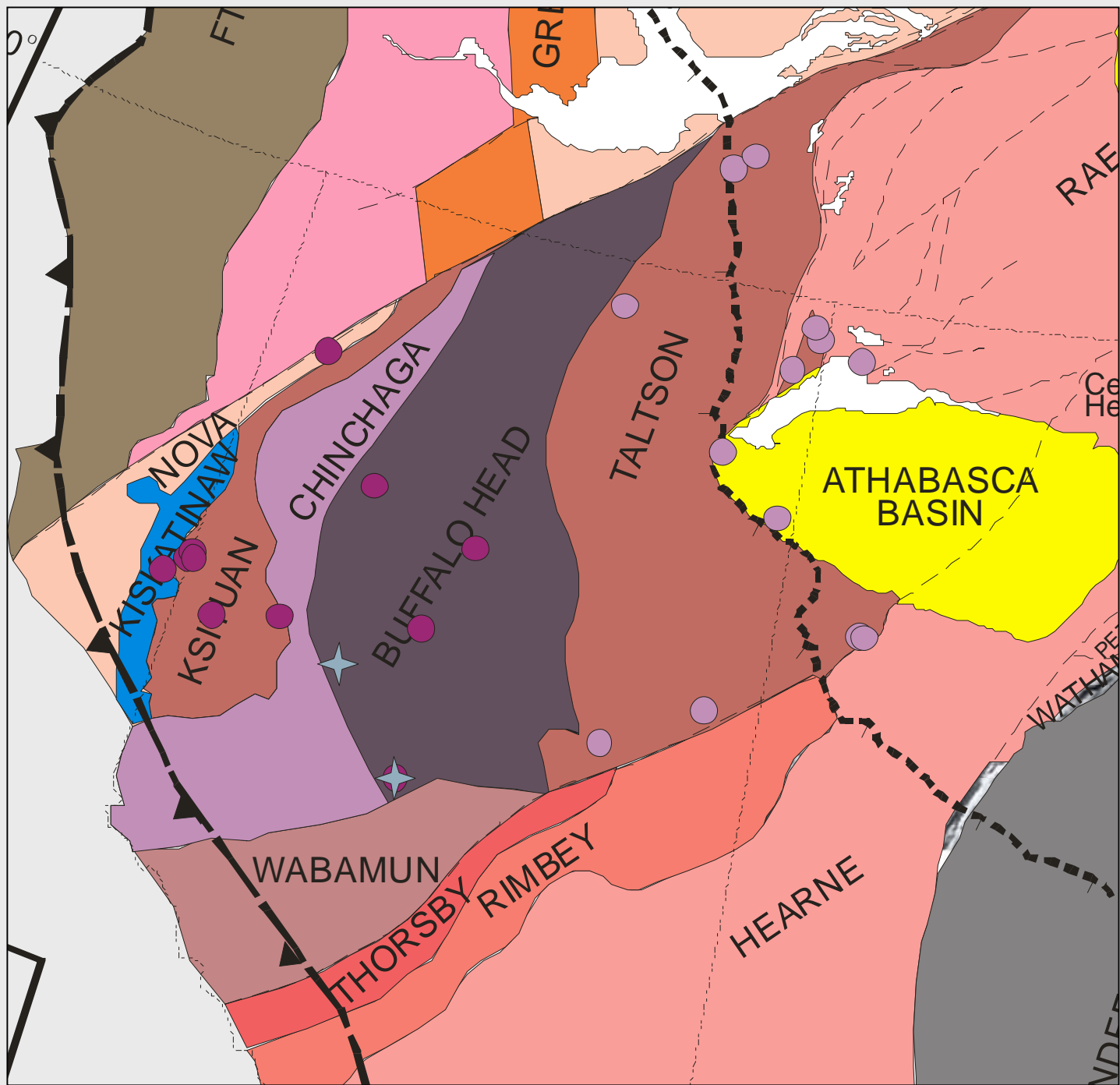
Domains are mainly based on aeromagnetic signatures

Shouldn't be confused with terranes in the tectonic sense

Western Rae Margin: 2400-1800 Ma



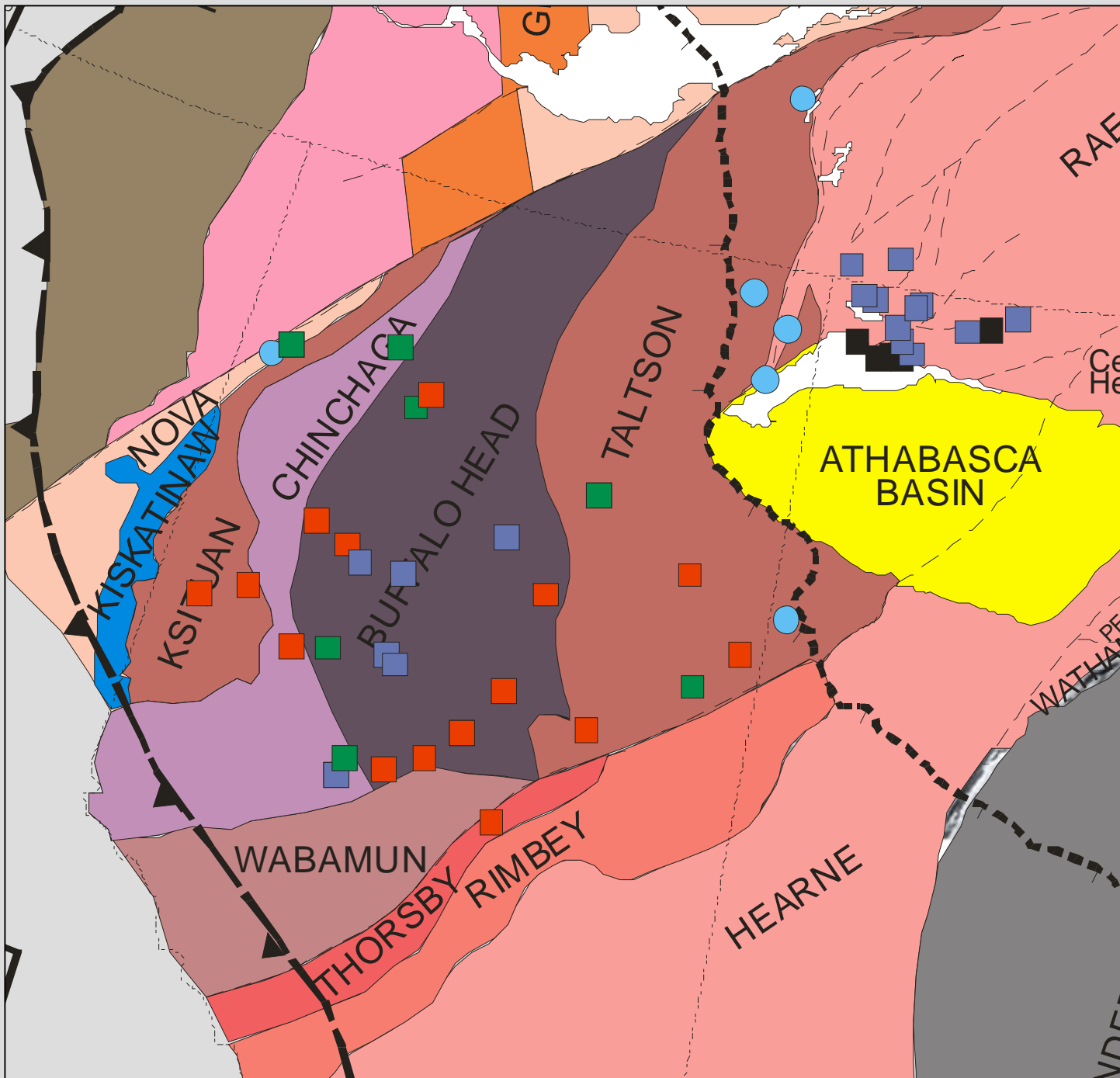




2000-1960 Story

- 1985-1960 Ma Taltson arc?
- ★ 1980 Ma metamorphism
- 2000-1985 Ma: Ksituan-Thelon arc?

New subduction zone sets up under Rae as Chinchaga-Buffalo Head-Slave terrane approaches?



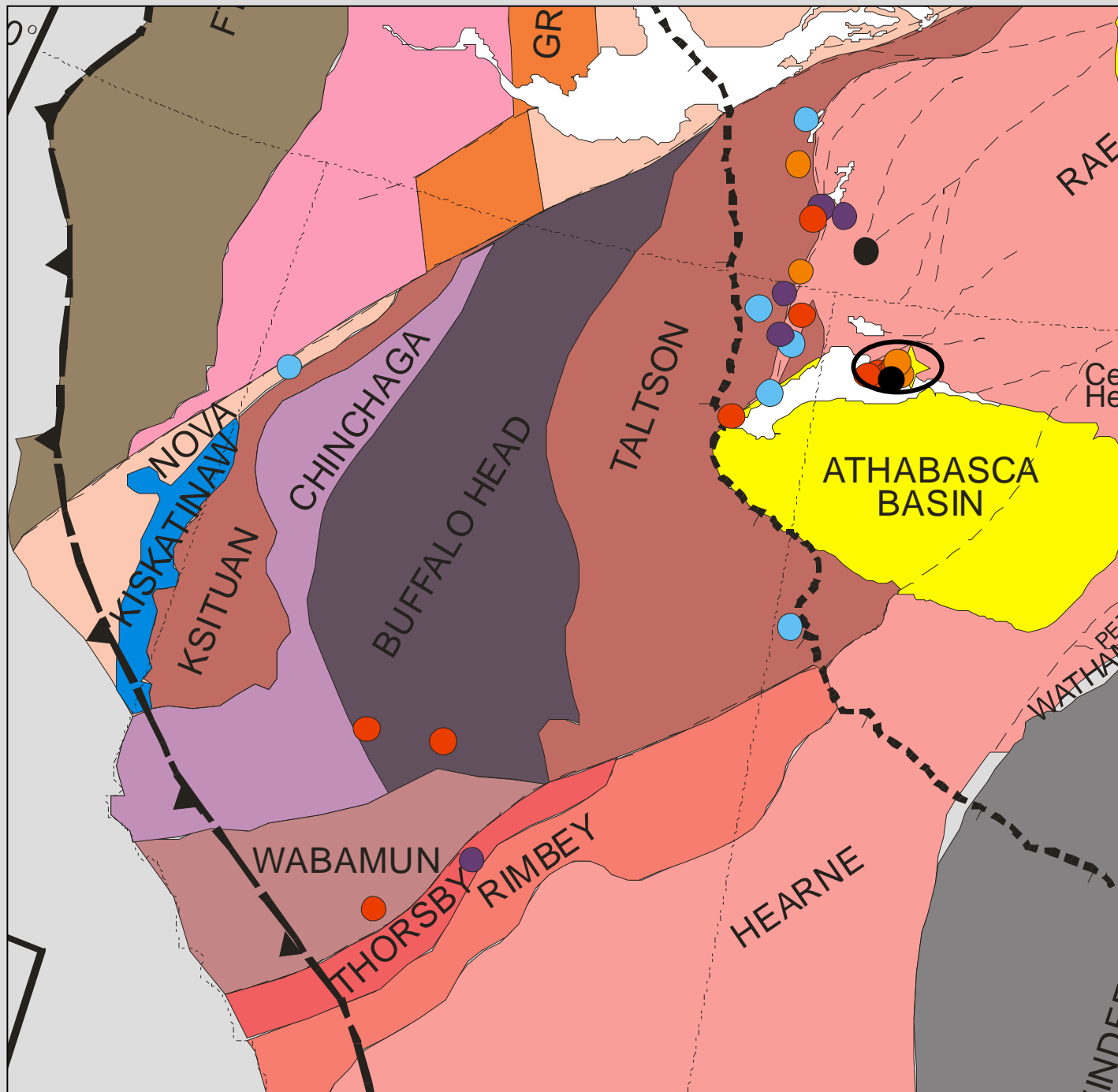
T_{DM}

- 2.48-2.6 Ga
- 2.6-2.8 Ga
- 2.8-3.0 Ga
- 3.0-3.3 Ga

Rock Ages

- Archean

Few Archean rocks dated in western terranes but Nd data infers that most built on Archean material



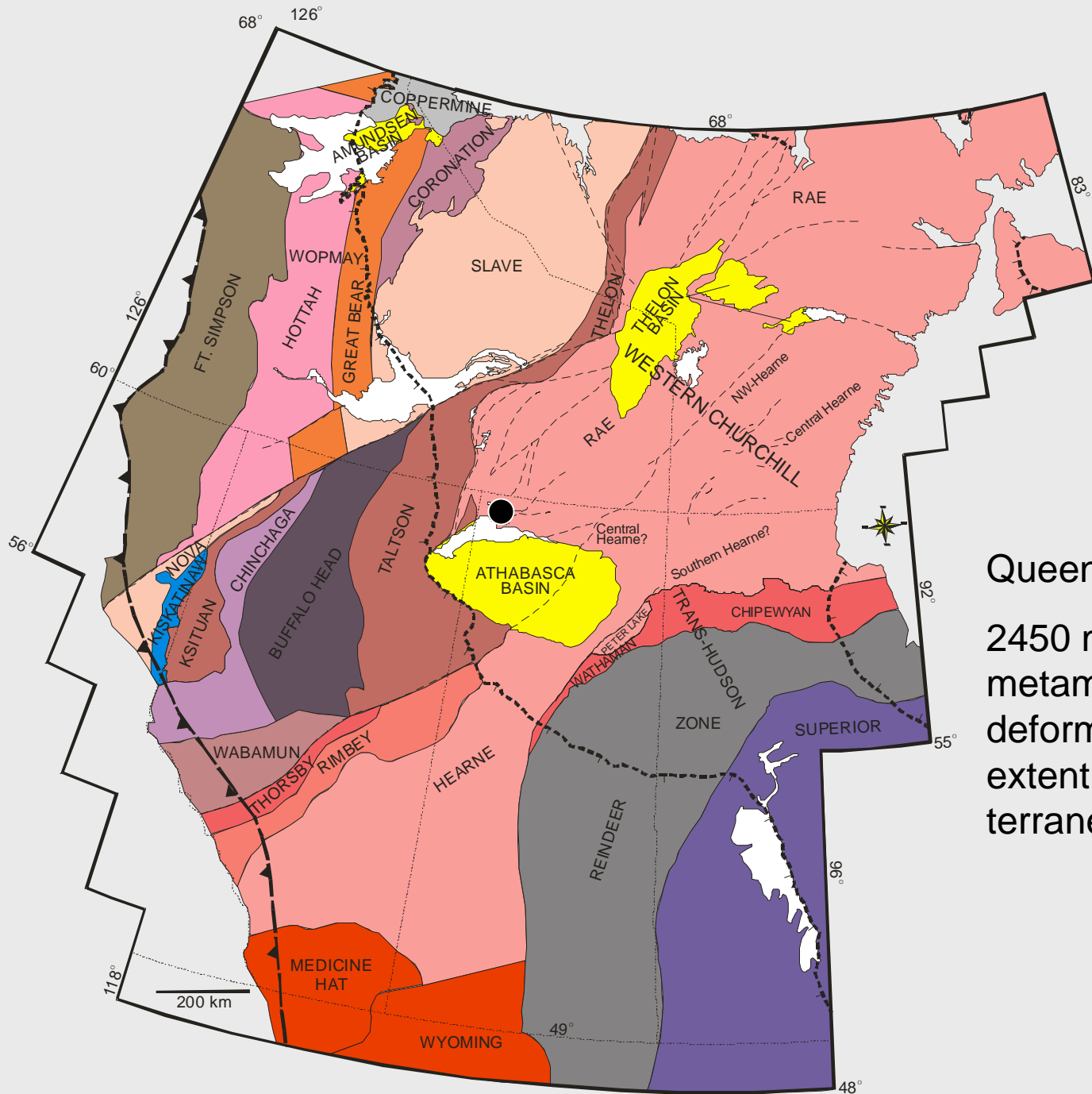
2.4-2.3 Ga Story

- 2330 Murmac Bay Gp
- 2330-2300 granites
- 2340 gabbro
- ★ Ca. 2350 metamorphism
- 2400-2380 arc?
- Archean

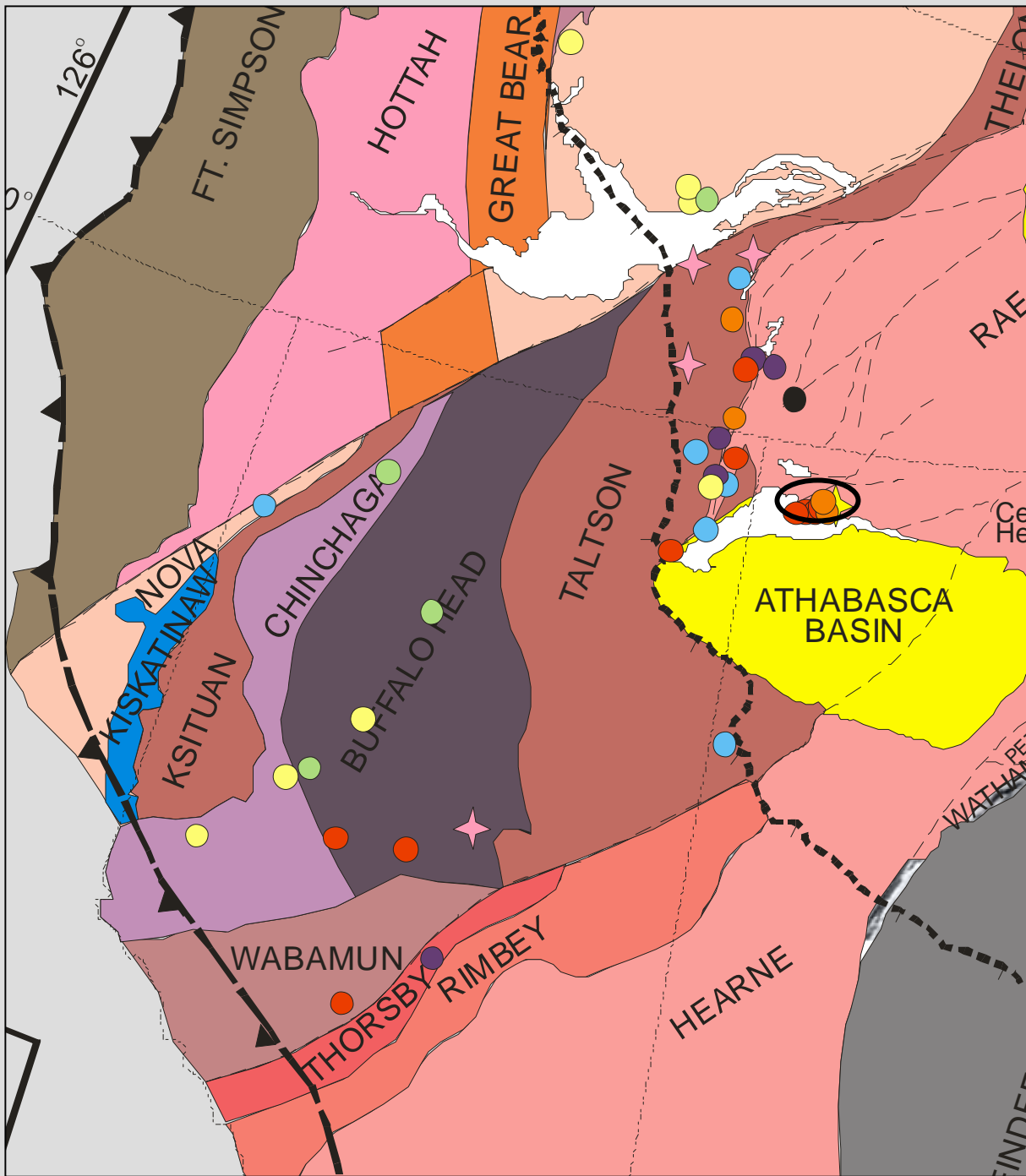
Terrane accretion to western Rae margin?

Wabamun-Thorsby extension of Rae margin or separate?

MBG post-collisional extension or separate rifting?



Queen Maud Block:
 2450 magmas and 2350
 metamorphism and
 deformation → northern
 extent of this accreted
 terrane or an earlier one?



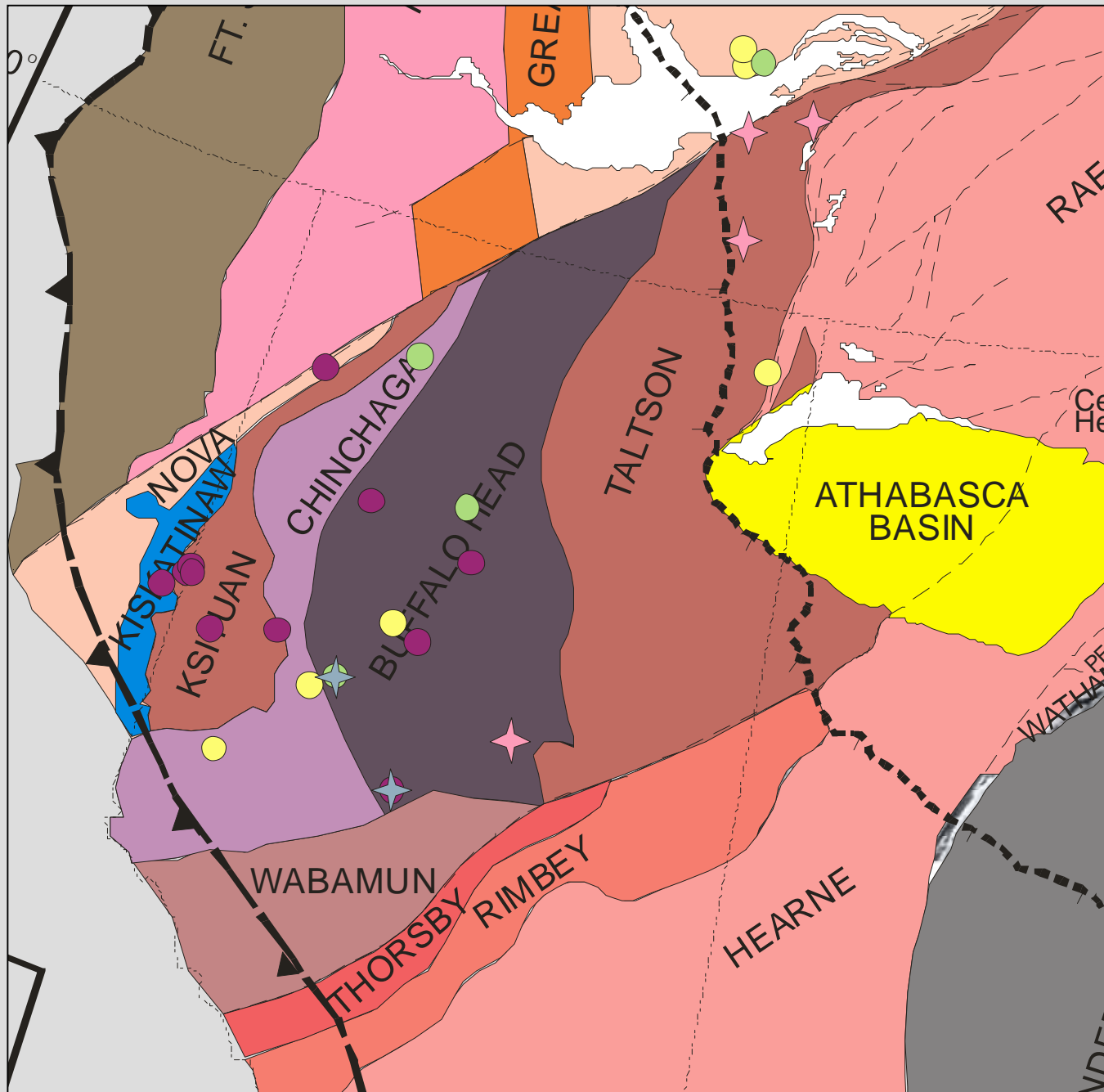
2.2-2.0 Ga Story

- ★ 2093-2044 meta
- 2094-2014 por gr; an
- 2190-60; 2138; int; an
- 2330 Murmac Bay Gp
- 2330-2300 granites
- 2340 gabbro
- ★ 2350 meta
- 2400-2380 arc?
- Archean

2190-60, 2094-14: periods of rifting and/or subduction?

Did southern Chin-BH rift off Slave?

Rae margin inactive

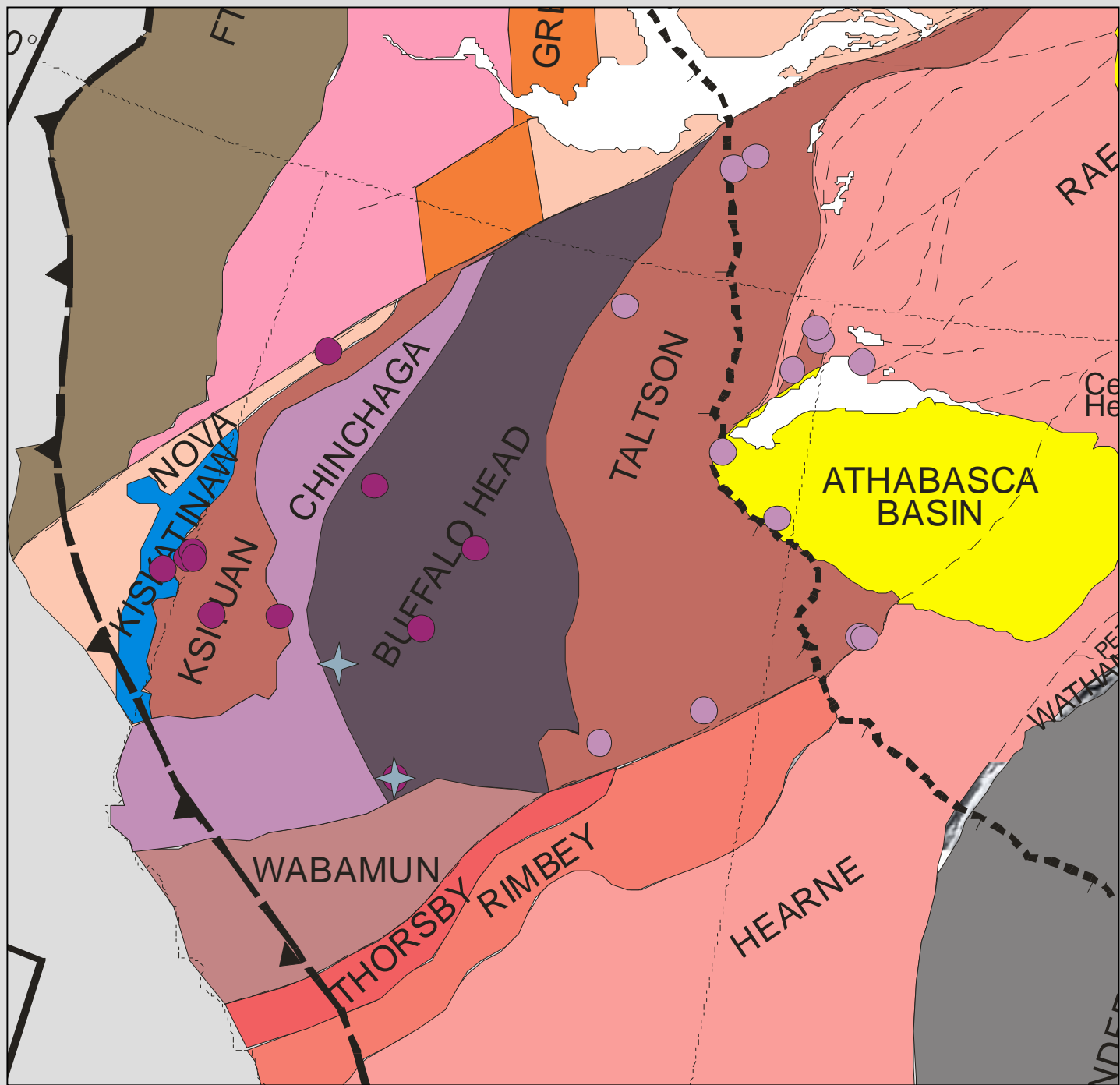


2000-1980 Story

- ★ 1980 Ma metamorphism
- 2000-1985 Ma: Ksituan-Thelon arc?
- ★ 2093-2044 meta
- 2094-2014 por gr; an
- 2190-60; 2138; int; an

Subduction under Chinchaga-Buffalo Head Terrane followed by collision of Slave Craton?

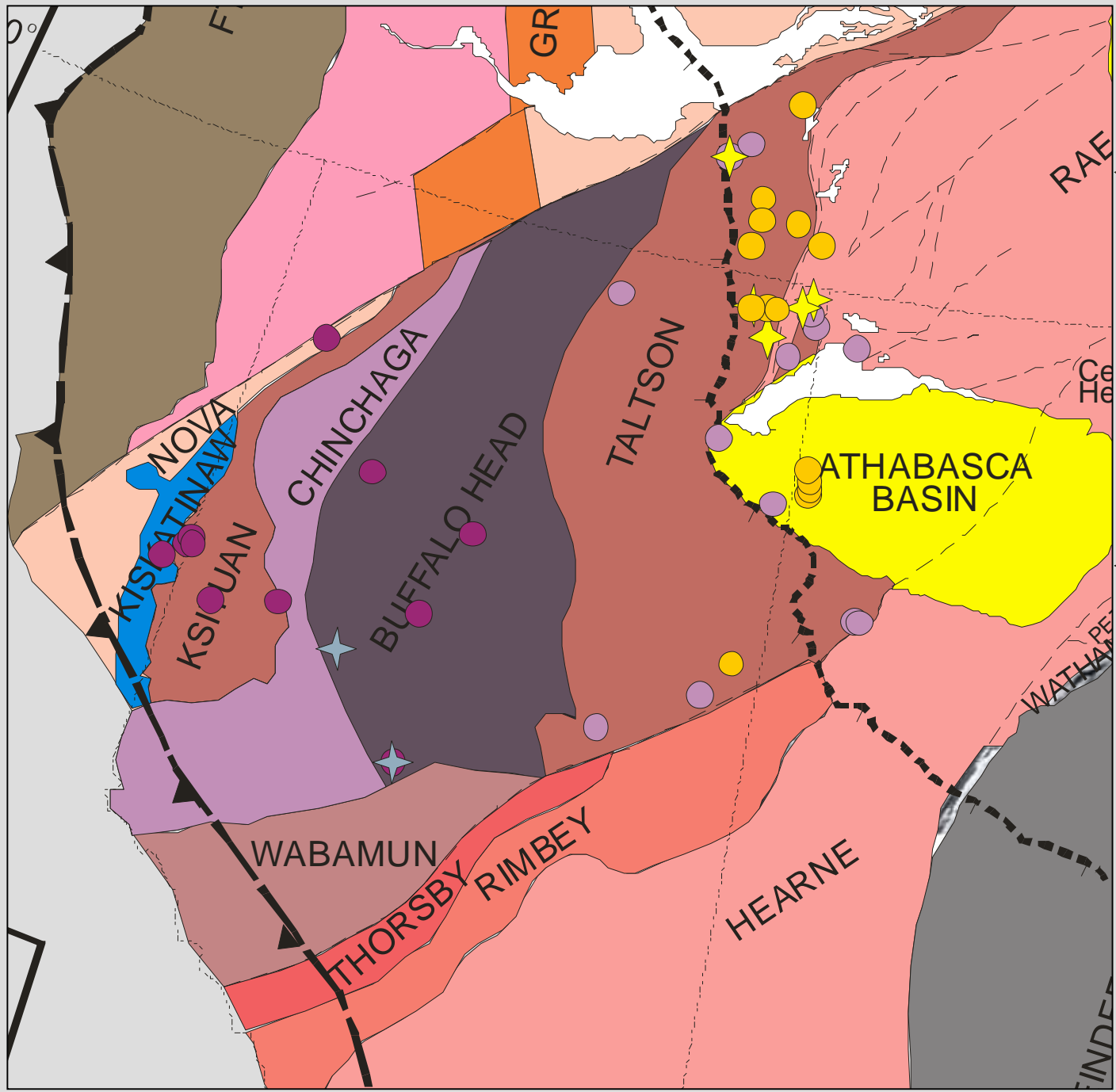
Rae margin inactive



1985-1960 Story

- 1985-1960 Ma Taltson arc?
- ★ 1980 Ma metamorphism
- 2000-1985 Ma: Ksituan-Thelon arc?

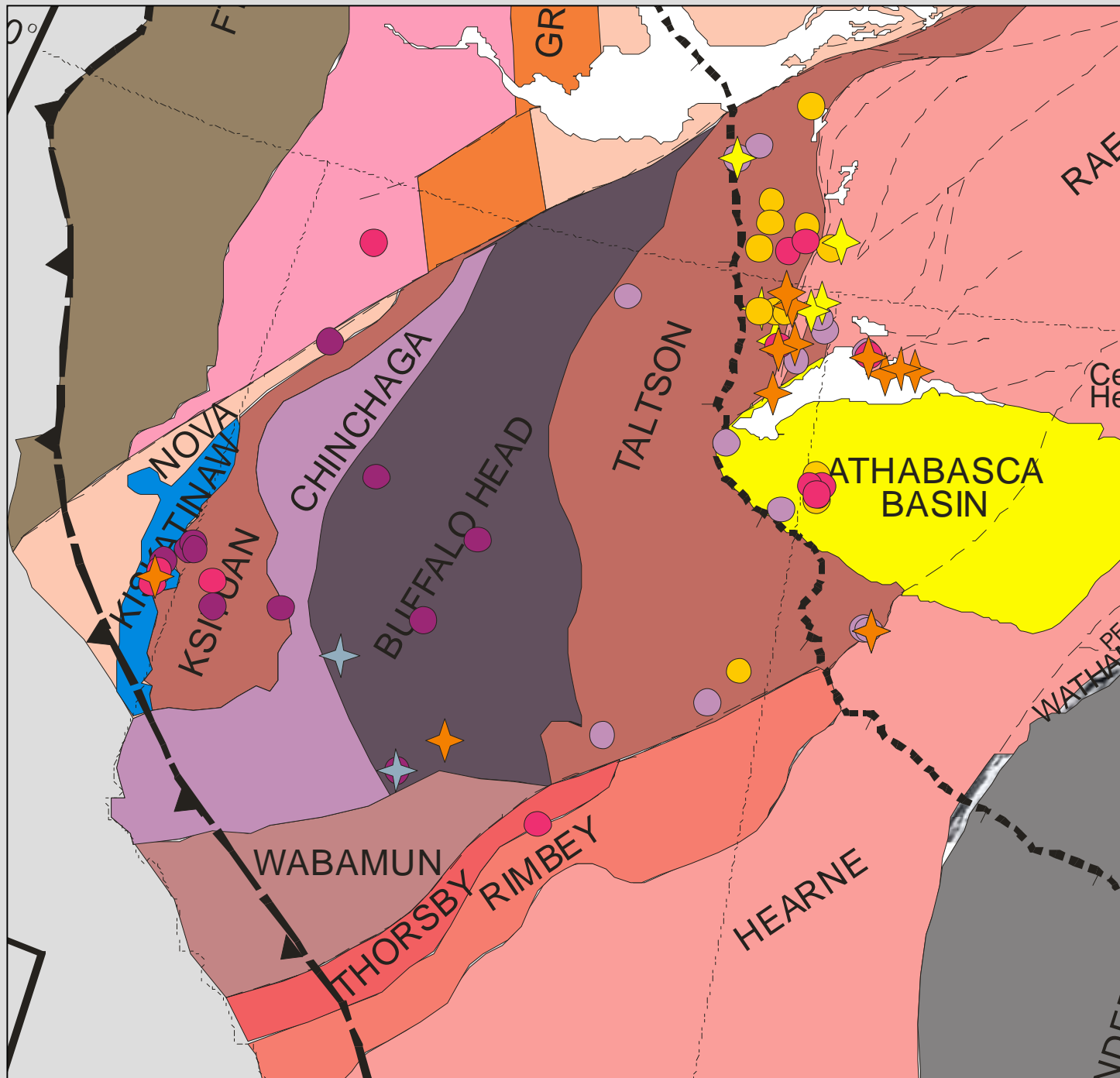
New subduction zone sets up under Rae as Chinchaga-Buffalo Head-Slave terrane approaches?










1960-1930 Story

- ★ 1960-1930 Ma metamorphism
- 1960-1930 Ma syn-collisional
- 1985-1960 Ma Taltson arc?
- ★ 1980 Ma metamorphism
- 2000-1980 Ma: Ksituan-Thelon arc?

Chinchaga-Buffalo Head-Slave Terrane or exotic precursors begin to collide with Rae



1930-1900 Story

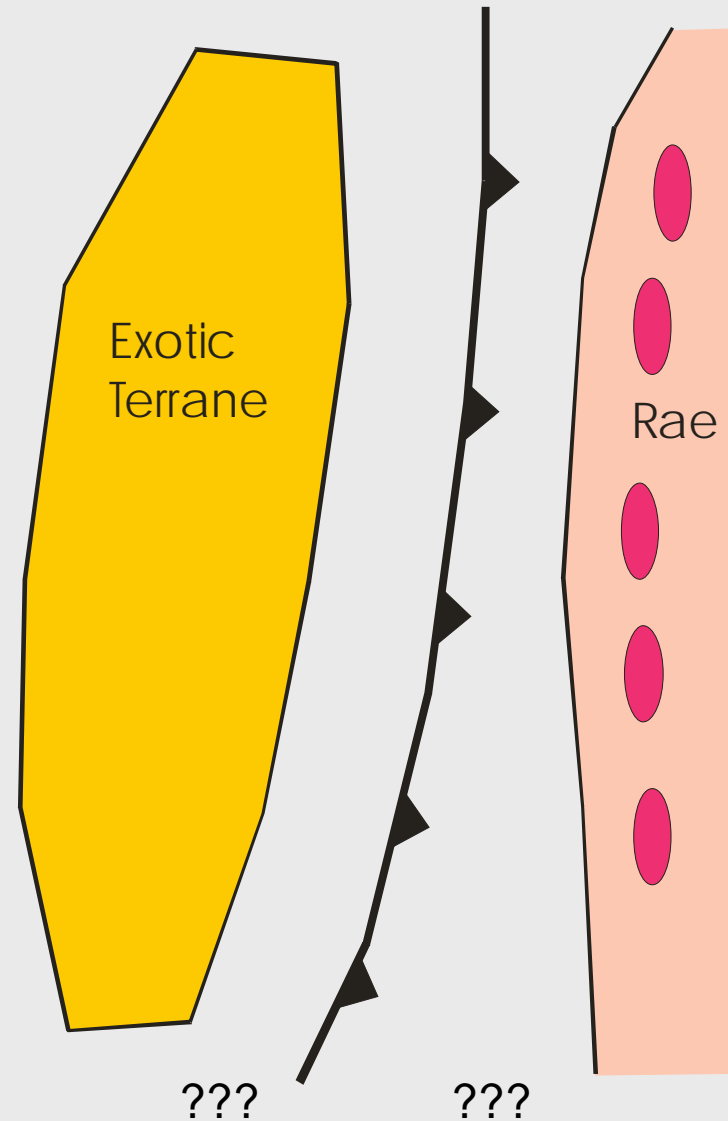
-  1930-1900 meta
-  1930-1900 Ma syn-meta gran
-  1960-1930 Ma metamorphism
-  1960-1930 Ma syn-collisional
-  1980-1960 Ma Taltson arc?
-  1980 Ma metamorphism
-  2000-1980 Ma: Ksituan-Thelon arc?
- Terminal collision, re-activation?
- Nova = Hottah?

Evolution of Southwestern Rae Margin 1

2400: Subduction under Rae and approach of exotic Archean terrane that may extend northward to include Queen Maud Block

2350: Collision and metamorphism

2330-2300: Post-collisional plutons and Murmac Bay Group

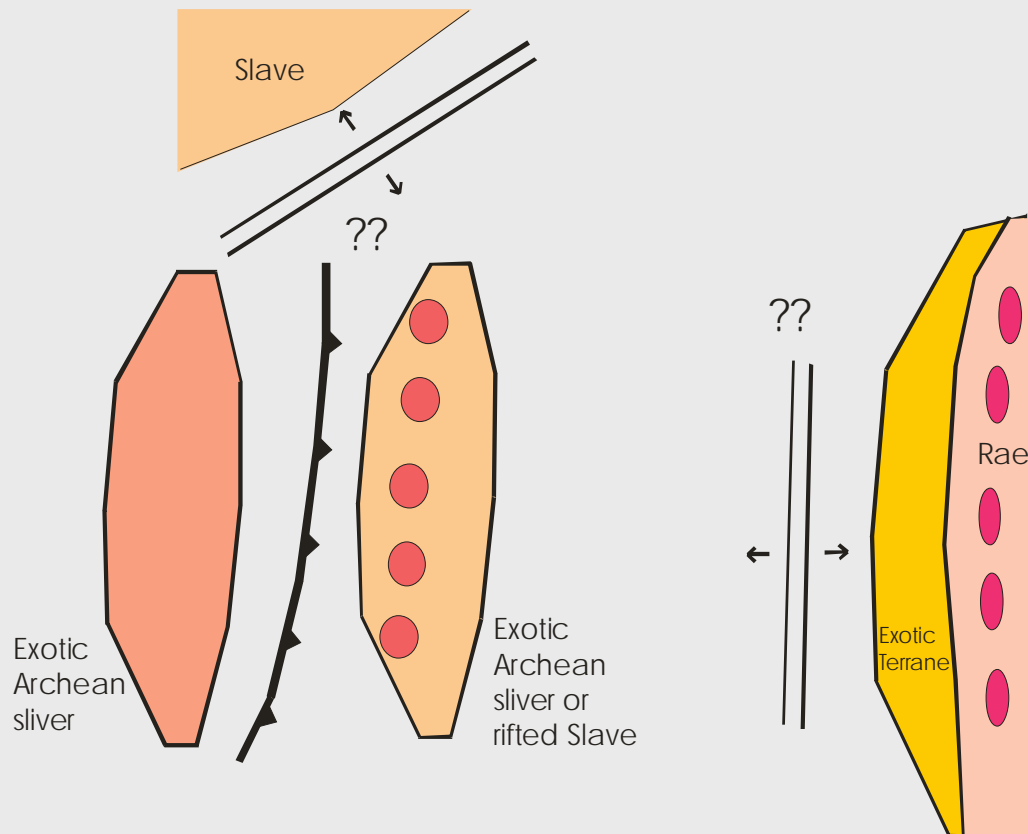


Evolution of Southwestern Rae Margin 2

2190-2160: A) Rifting of Slave, B) accreted terrane or C) subduction beneath outboard terrane

2094-2014: Syn- to post-collisional granites?

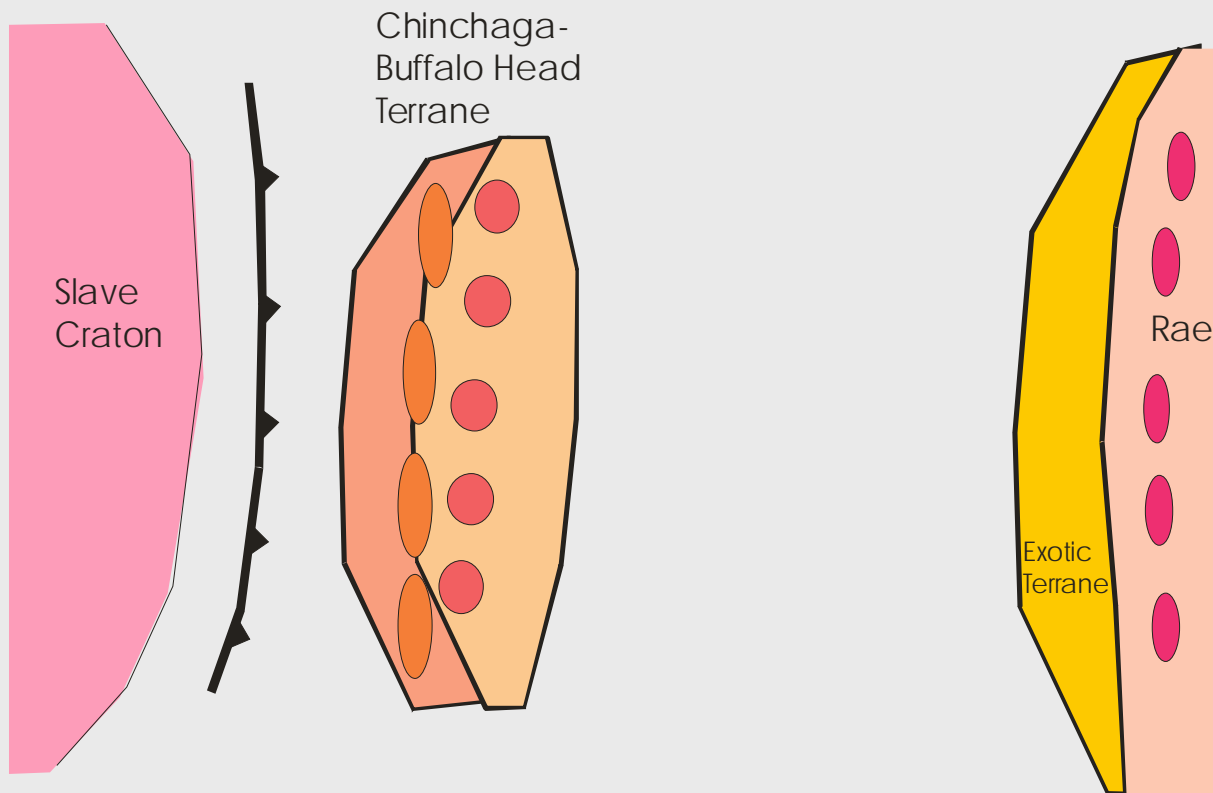
2093-2044: Collision and metamorphism not recorded in Rae



Evolution of Southwestern Rae Margin 3

2000-1985: East-dipping subduction under Chinchaga-
Buffalo Head terrane

~1980: Slave collides with C-BH Terrane; east-dipping
subduction begins under Rae

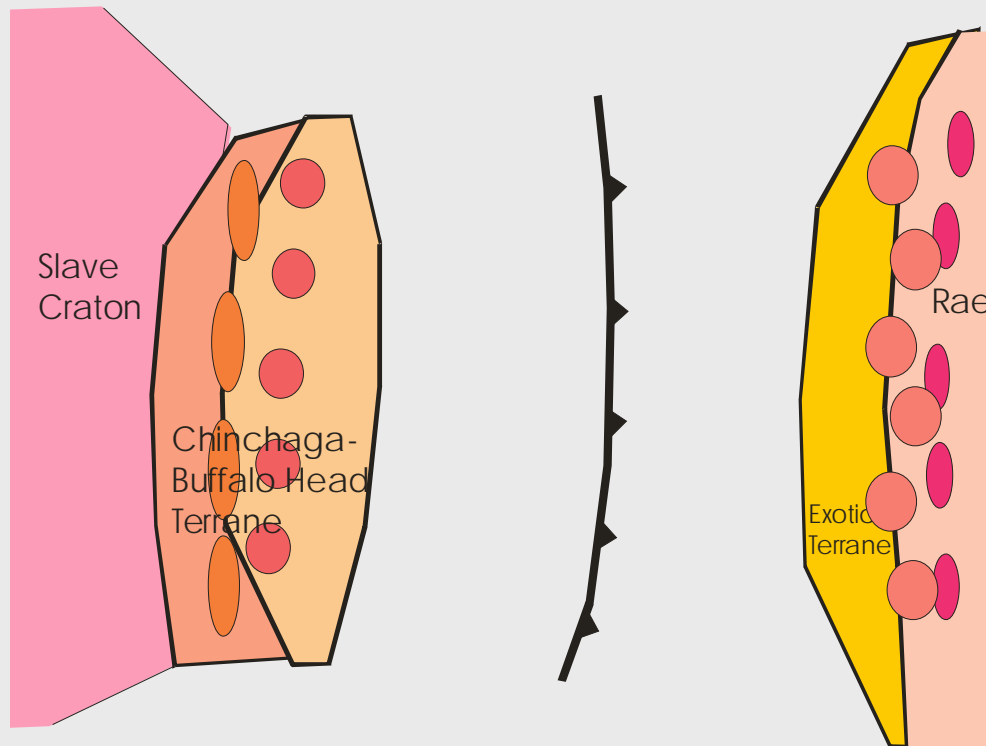


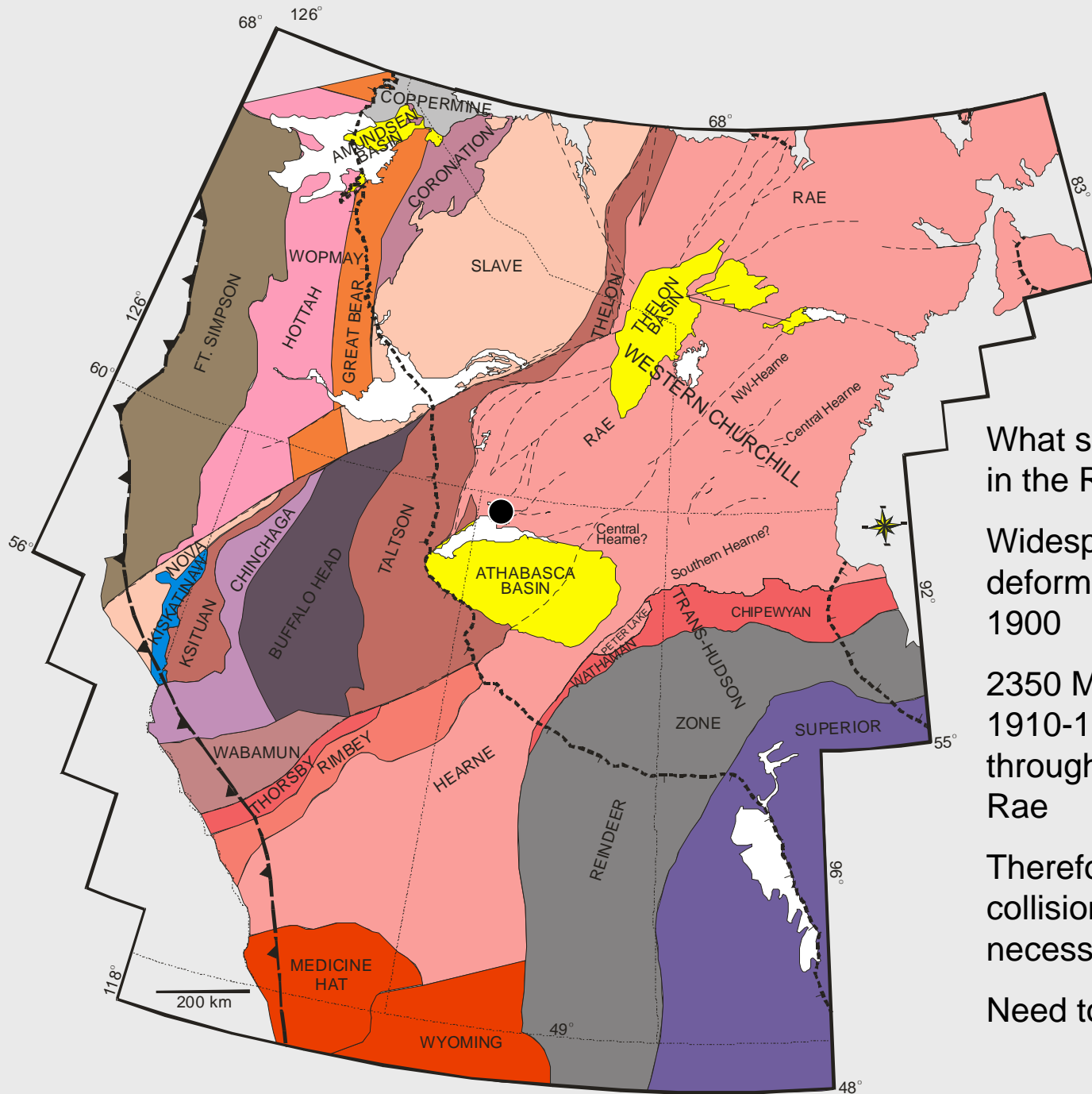
Evolution of Southwestern Rae Margin 4

1985-1960: Slave-C-BH micro-continent approached & collides with Rae

1960-1930: Syn-collisional plutons emplaced in Rae margin

1930-1900: Metamorphism and syn-metamorphic granitoids in Rae margin





What should be the ramifications in the Rae Province?

Widespread metamorphism & deformation at 2350 and 1930-1900

2350 Ma event now showing up; 1910-1900 Ma event recorded throughout full extent of southern Rae

Therefore, a Rae-Hearne collision possible but not necessary

Need to check detrital story!

Conclusions & Speculations

- Accretion at western Rae margin at ~2.35 and ~1.96 → metamorphism & deformation throughout Rae
- Wabamun, Thorsby & southern Buffalo Head may represent reworked Rae margin rather than separate terranes?
- Queen Maud Block appears to be northern extent of a terrane accreted to Rae at 2.35?
- Chinchaga-Buffalo Head Terrane may be a slice off Slave?
- Slave? collides with Chinchaga-Buffalo Head Terrane (~1980); before it collides with Rae (~1960)
- Thelon-Taltson Orogen is very complex!!!

