

ID-TIMS Geochronology

Metal Earth transects 2018-2019

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UNIVERSITY OF
TORONTO



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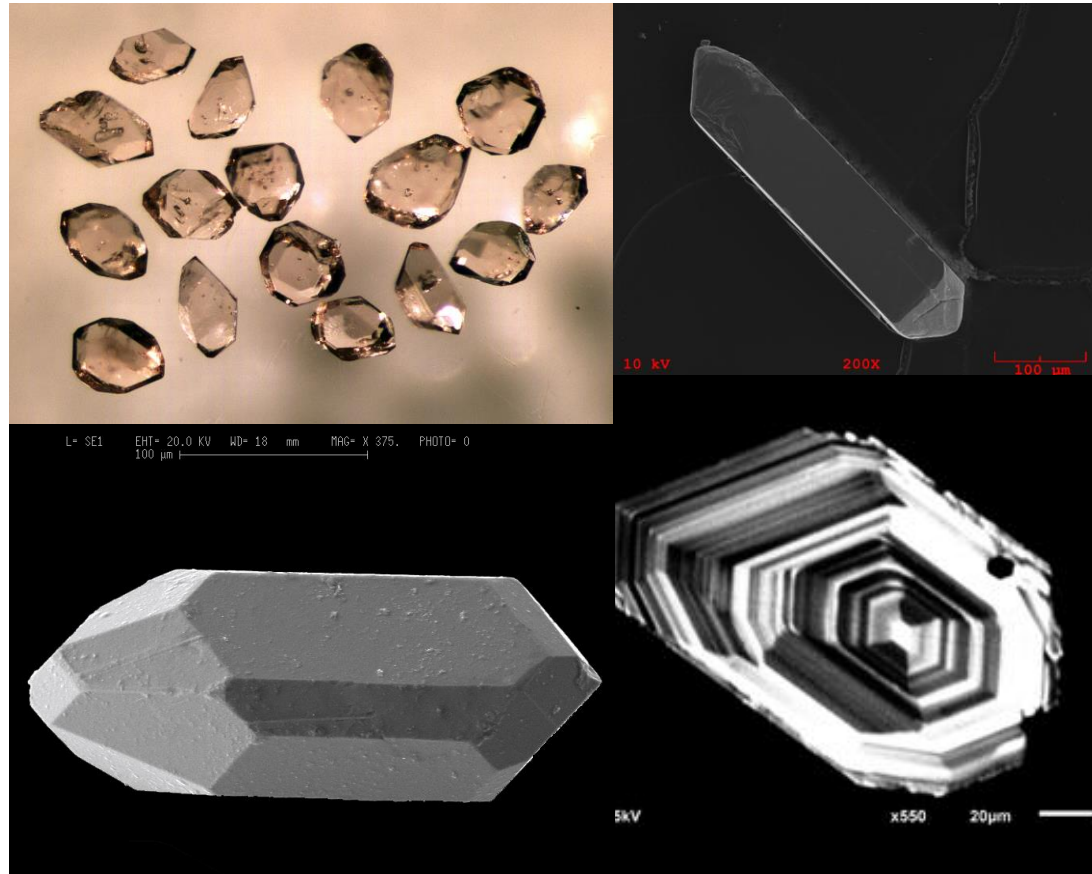
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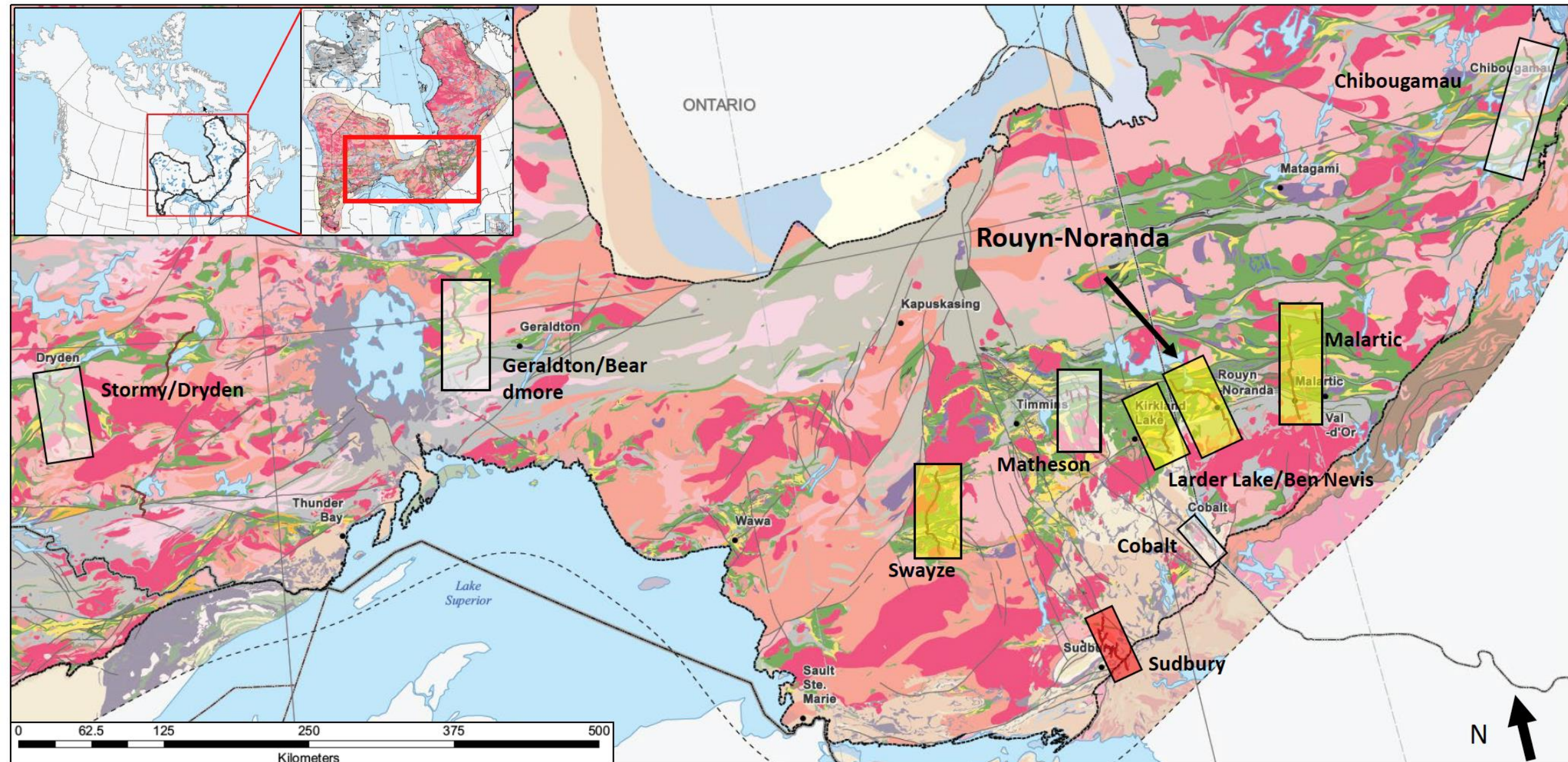
Outline: Metal Earth U-Pb (CA-ID-TIMS)

Transect results - highlights



- Chibougamau
- Rouyn-Noranda
- Larder Lake
- Onaman-Tashota

Location



Chibougamau transect

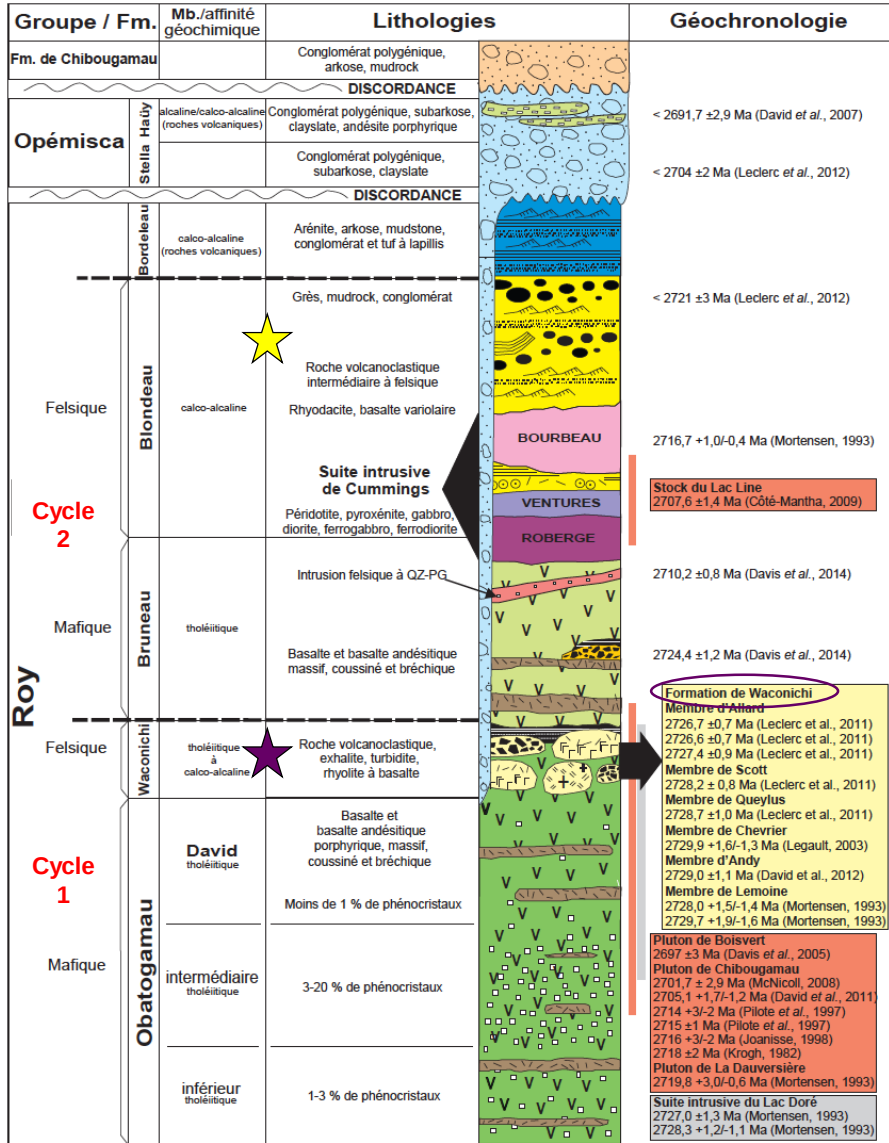
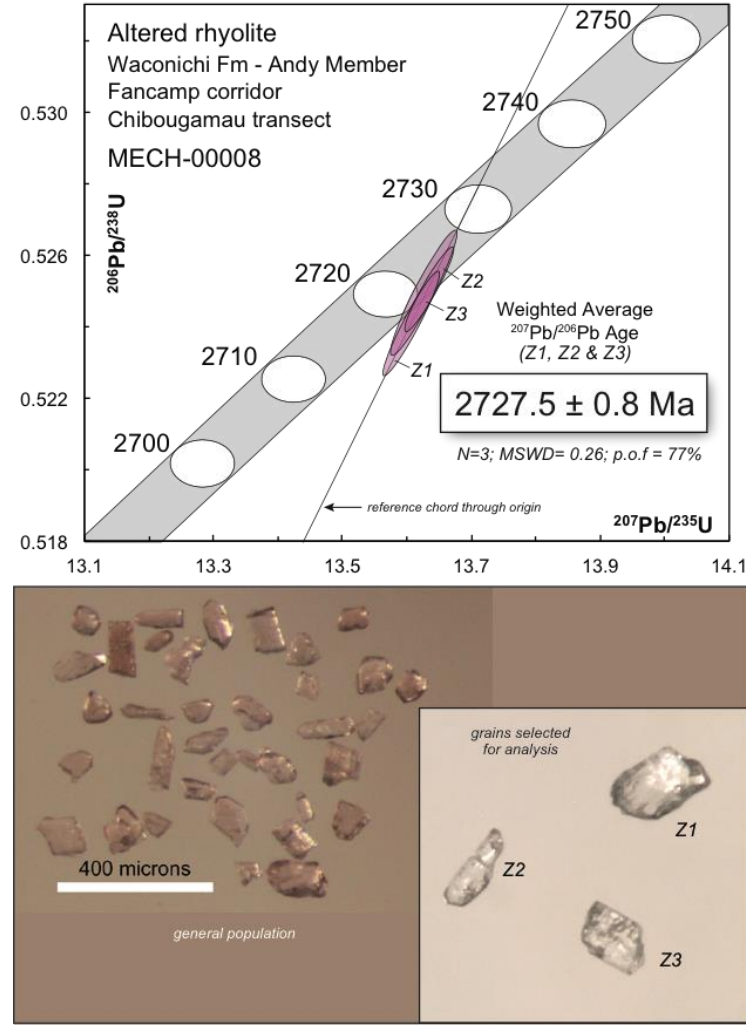


FIGURE 5 - Stratigraphie de la région de Chibougamau. L'affinité géochimique est donnée pour le faciès dominant. L'emplacement relatif des plutons granitoides est indiqué par un trait rose; un trait gris indique la position de la Suite intrusive du Lac Doré

Felsic top of Cycle 1 magmatism - Roy Gp

Establish age of altered rhyolite of Waconichi Fm.
in Fancamp corridor, where it is unconstrained

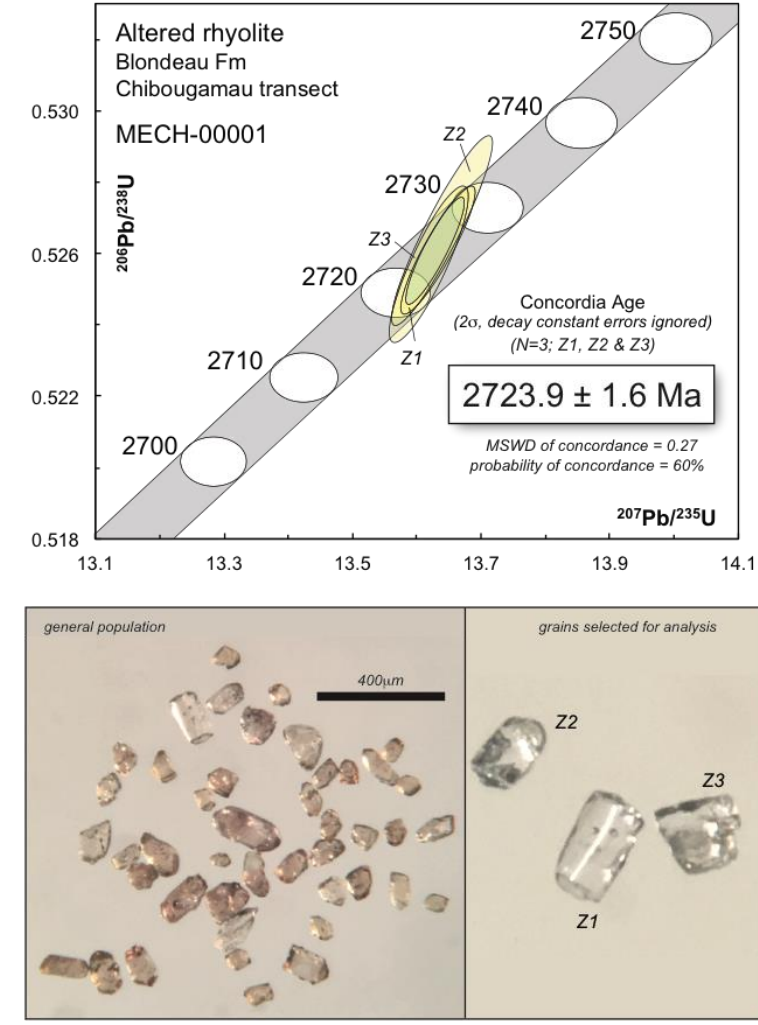
* Waconichi locally has VMS potential *



Consistent with ages of other members of Waconichi Fm – extends correlations into Fancamp exploration corridor.

Felsic top of Cycle 2 magmatism - Roy Gp

Establish age of altered rhyolite of Blondeau Fm.



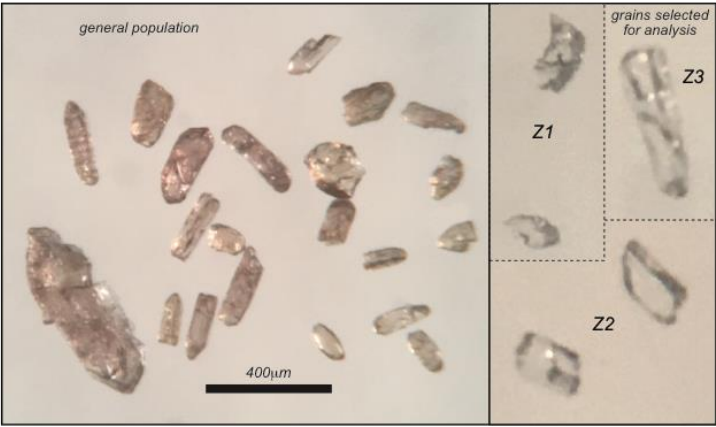
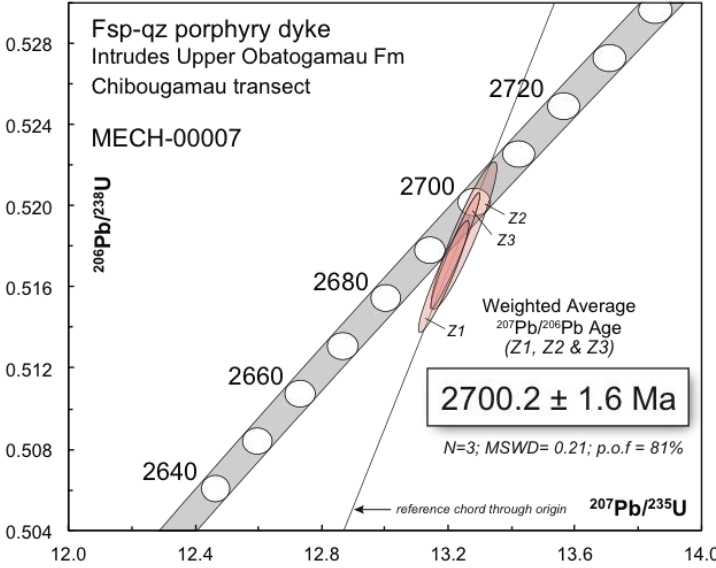
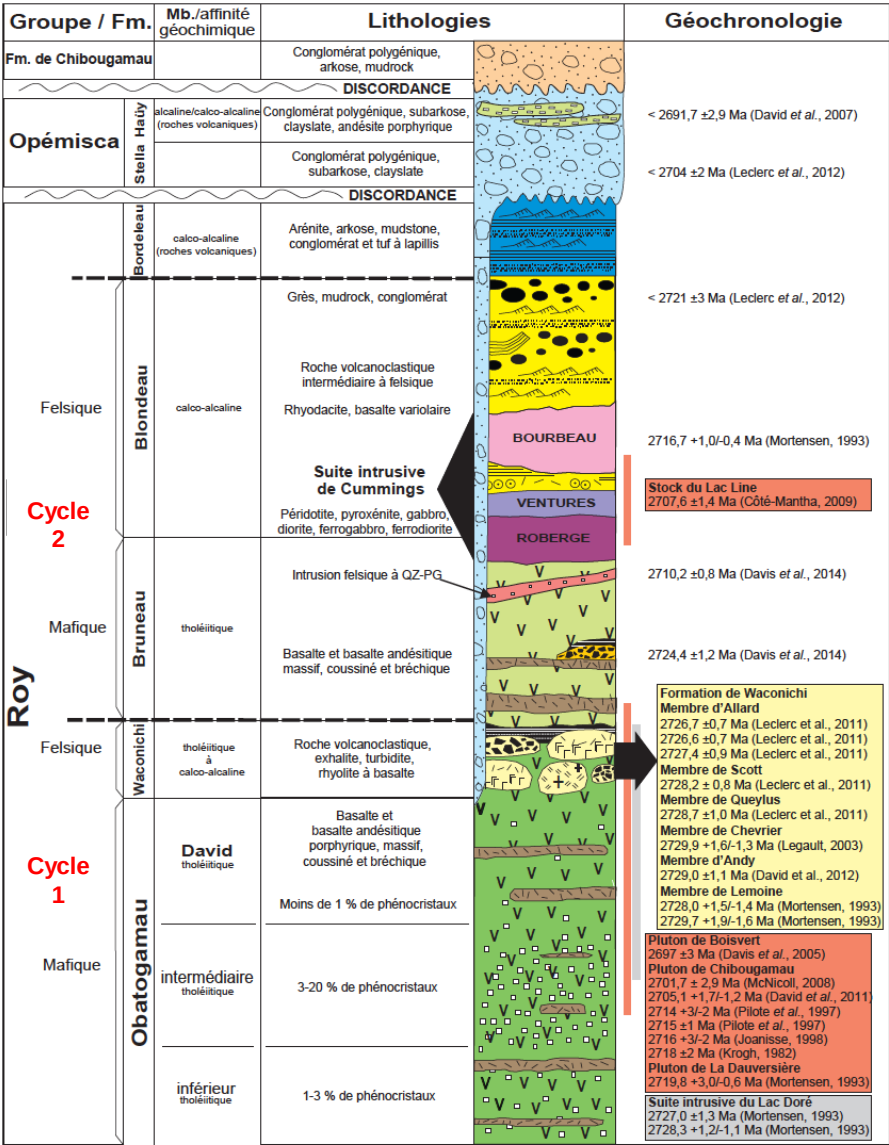
First age for Blondeau Fm volcanism (voluminous upper, felsic portion of Cycle 2)
Crystal tuff in underlying Bruneau Fm: 2724.4 ± 1.2 Ma

Chibougamau transect

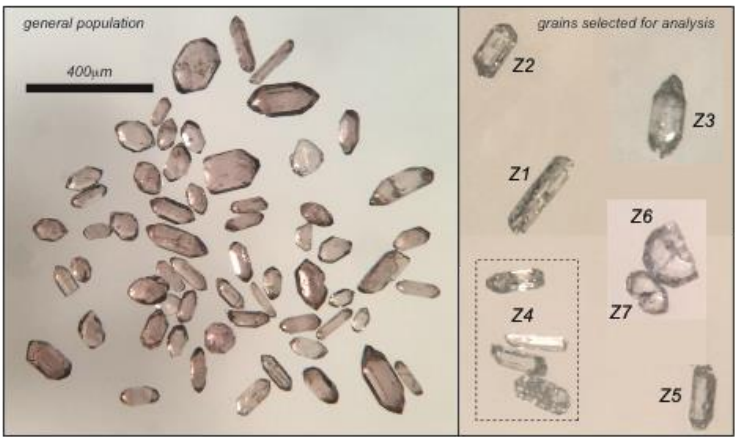
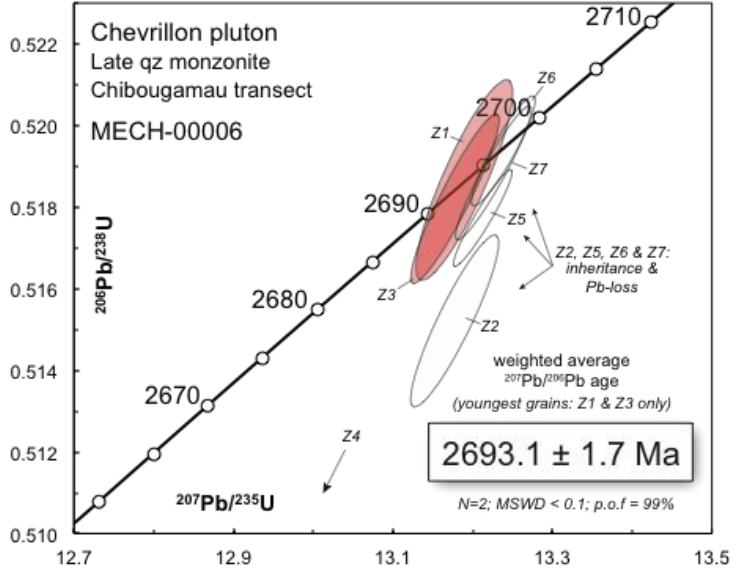
Younger granitoids

QFP intrudes upper Obatogamau Fm volcanics

Pluton intrudes Chébistuan Fm sediments of northern basin



Similar to youngest ages of
Chibougamau pluton (2701.7 ± 2.9 Ma) and
Boisvert pluton (2697 ± 3 Ma)



First age for this pluton; constrains ages of late alkaline plutons.
Establishes minimum age for Chébistuan Fm and Opémiska
sediments of the northern basin.
Cf. Syénite de Berthiaume (2688 ± 1 Ma),
Lac Shortt carbonatite (2691 ± 5/-3 Ma)

FIGURE 5 - Stratigraphie de la région de Chibougamau. L'affinité géochimique est donnée pour le faciès dominant. L'emplacement relatif des plutons granitoides est indiqué par un trait rose; un trait gris indique la position de la Suite intrusive du Lac Doré

Après Leclerc et al., 2017

Chrissie &
des Vents
Fms
ca.
2795 Ma

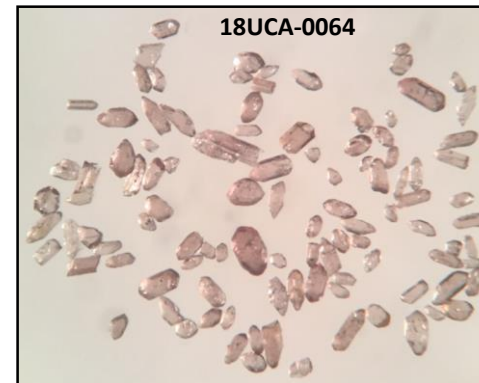
Chibougamau transect

2018-2019 ID-TIMS geochron targets



NORTH LEG of TRANSECT

- **18UCB-0057B**: Rhyolite – for 1st direct dating of the Obatogamau Fm. (2.73 or 2.76-2.79 Ga?)
- **18UCA-0064**: Rhyolitic flow/lapilli tuff, Blondeau Fm interbedded with sulfide-bearing graphitic units. Adjacent Bourbeau gabbro sill (2717 Ma Cummings sill). Within Barlow d.z. – will provide constraints on timing. Tarku Resources stripping (stop 7, 2018 ME Field Trip)



- **18UCA-0139**: Rhyolitic flow, Blondeau Fm. breccia tuff with qz-phyric clasts.

SOUTH LEG of TRANSECT

- **18UCD-0043**: Eau Jaune Complex diorite – youngest intrusive.
- **18UCD-0137**: Eau Jaune Complex tonalite – Moly-Desgagne **Mo** showing.

Rouyn-Noranda transect

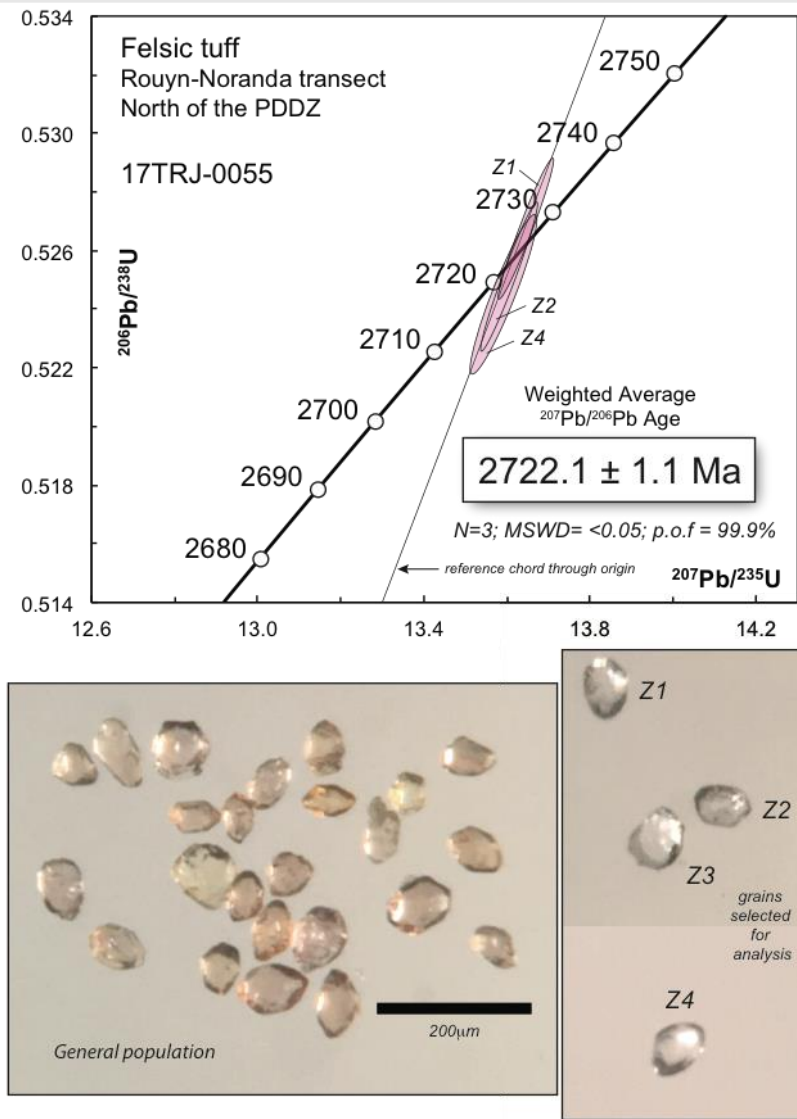
Q:
Does Deguisier Fm
(Kinojevis Gp) near QC-
ON border belong to:

Lower Kidd-Munro
(2719-2717 Ma)

or
Stoughton-Roquemaure
(2723-2720 Ma)
assemblage?

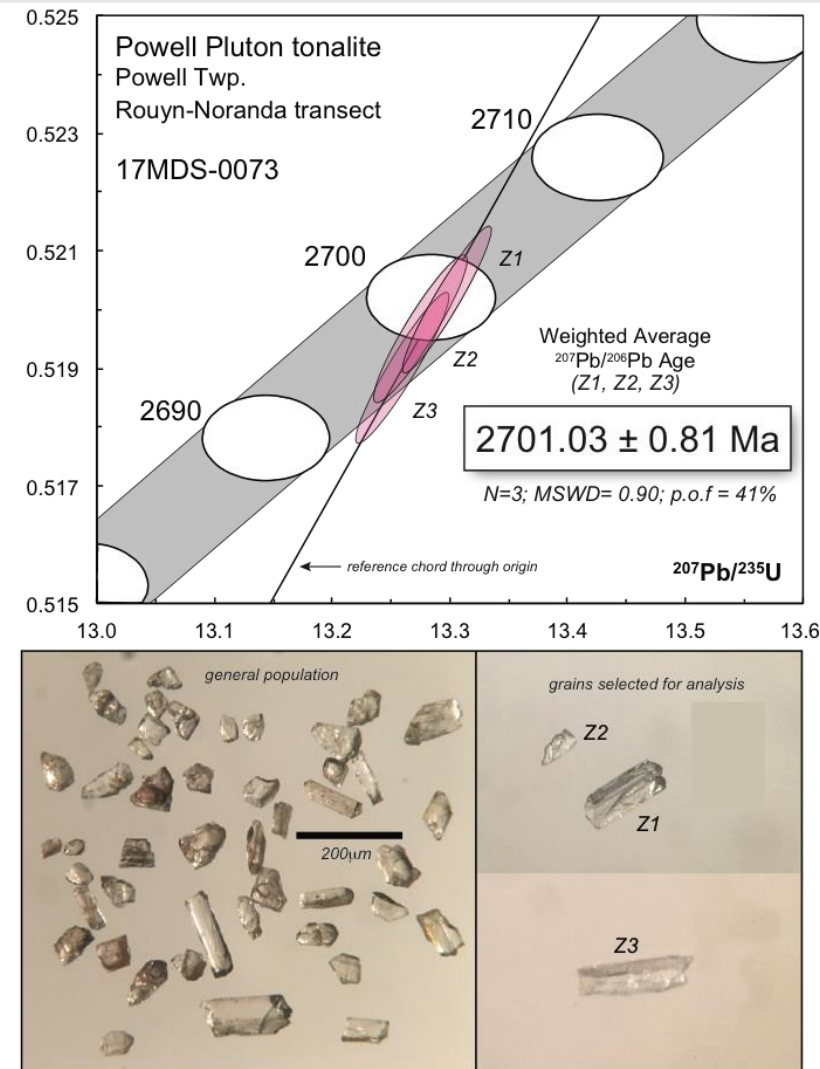
Newly discovered felsic
tuffs within pillowed &
massive high-Fe flows
suggest it belongs to
Stoughton-Roquemaure
assemblage.

(Jørgensen et al.
SEG – Keystone, 2018)



Age is statistically
overlapping with that
for Powell pluton
trondhjemite at
2700.1 ± 1.0 Ma, SW
of this locality
(McNicoll et al.,
2014).

This synvolcanic
pluton has many age
equivalents with
others in the Blake
River Gp, e.g. the
ca. 2702-2696 Ma
(Mooshla, Flavrian,
Fabie, Monsabrais,
etc., bodies)

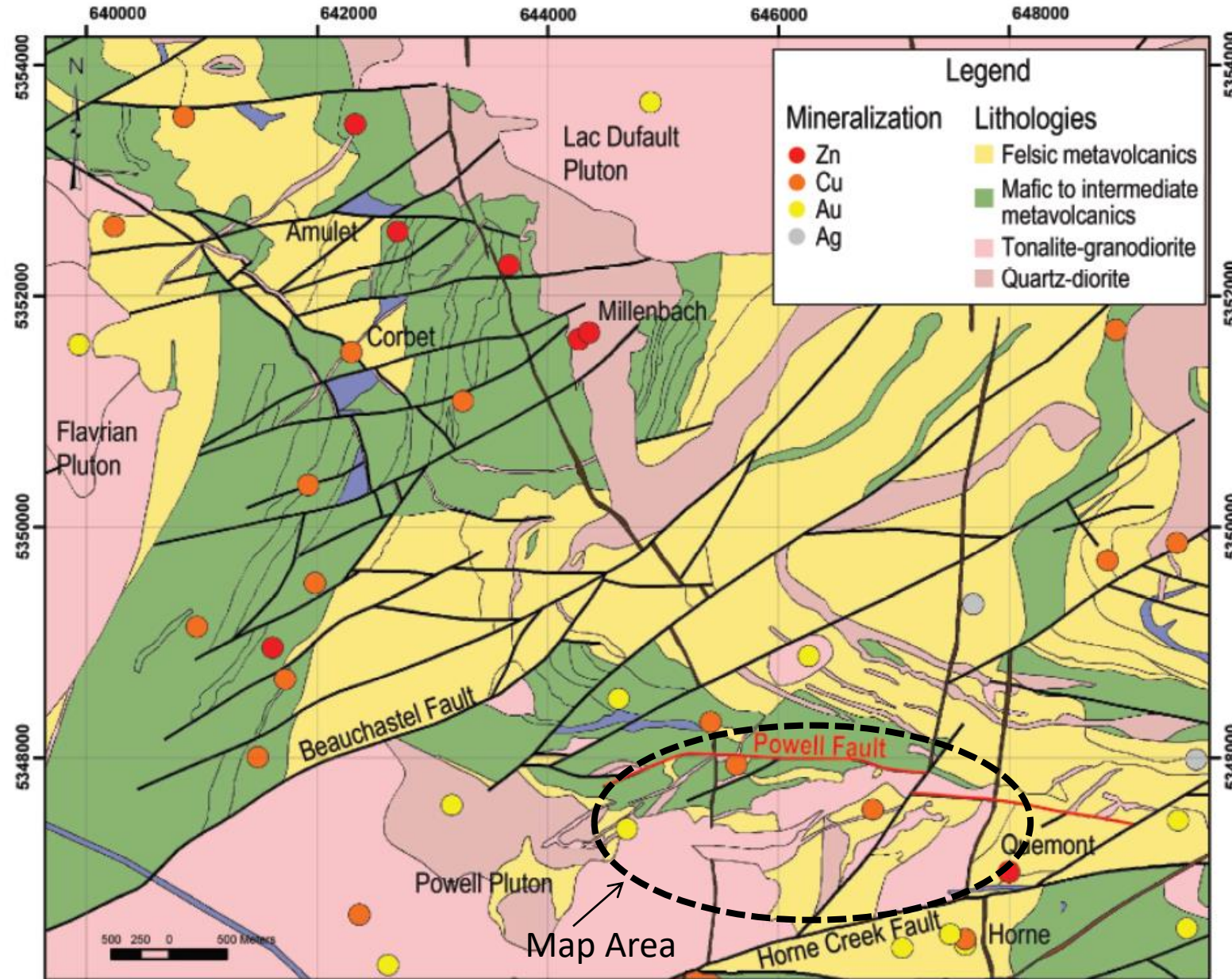


Transect projects

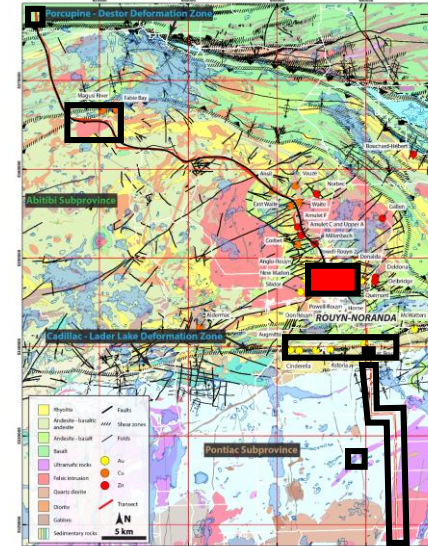
Rationale:

- ① Metallogeny of the Powell block (PB)
- ② Further definition of the volcanic and deformation history of the PB

- ◆ Cu-quartz vein mineralization occurs along NE-oriented structures
- ◆ Orogenic style quartz-carbonate-Au vein mineralization occurs along NW-oriented structures



Modified after Ministère des Ressources naturelles et de la Faune (2017)



Modified after Système d'information géominière of Québec (2017)

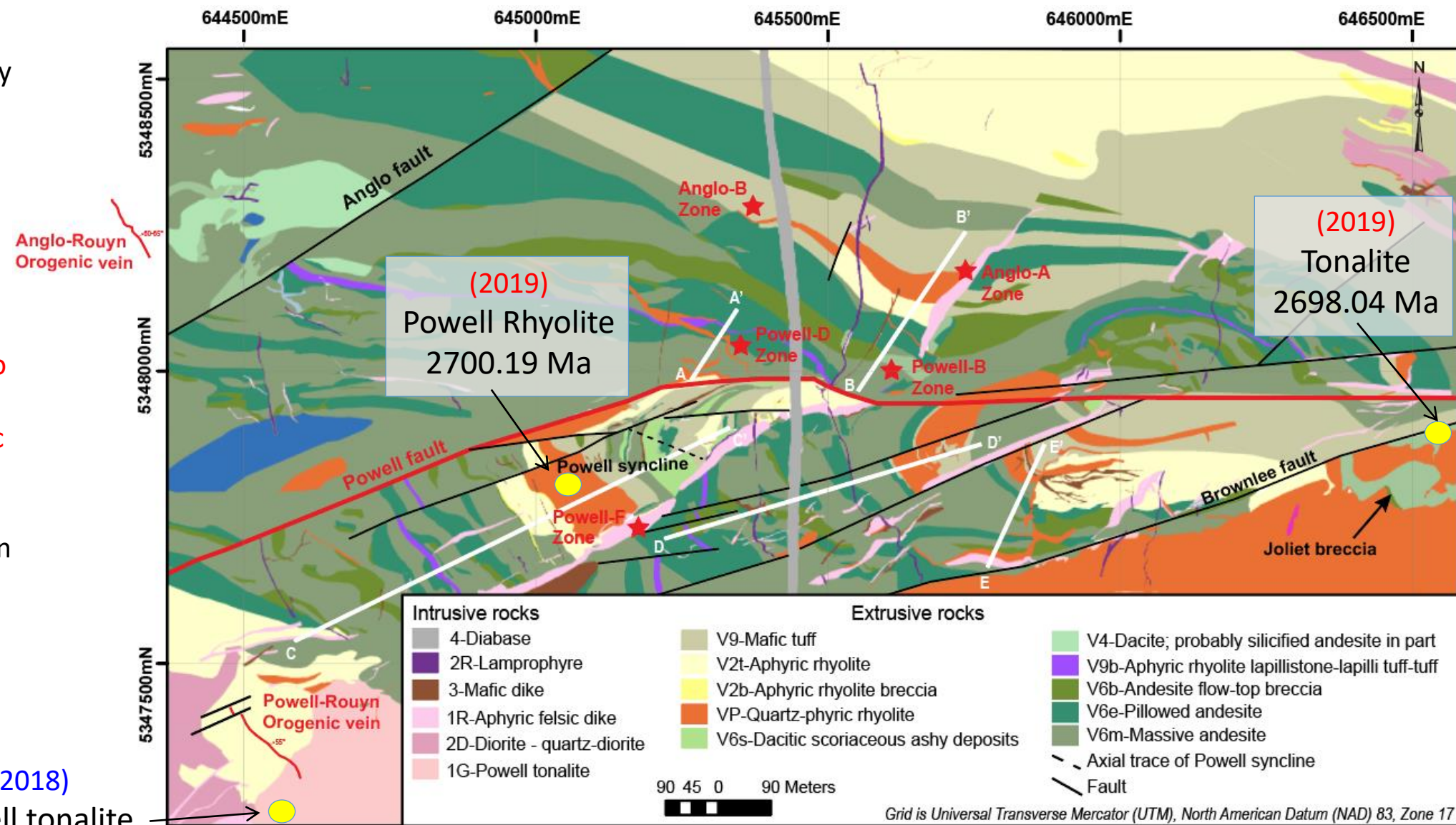
Marina D. Schofield
PhD Candidate



Transect projects

- Establish PB stratigraphy by constructing several stratigraphic sections
- Establish a chemostratigraphy
- U-Pb dating of zircon (TIMS) from key units to help establish a robust, high-resolution volcanic stratigraphy
- Structural and alteration overlay
- Recent work on the Powell fault suggests synvolcanic movement

(2018)
Powell tonalite
2701.03 Ma



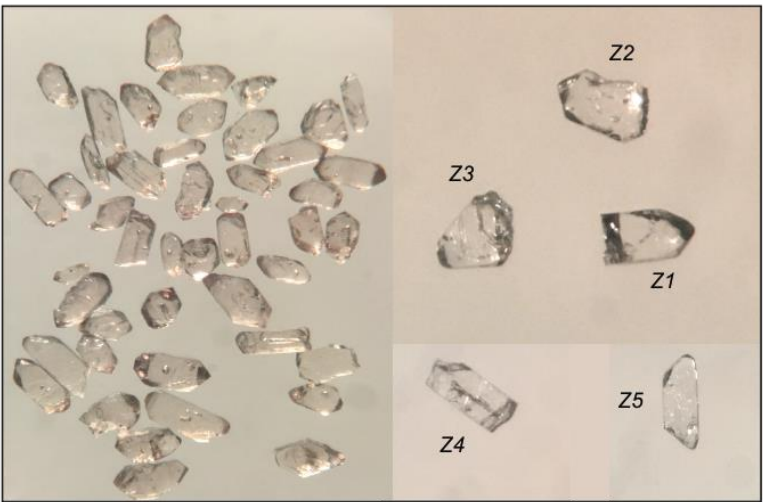
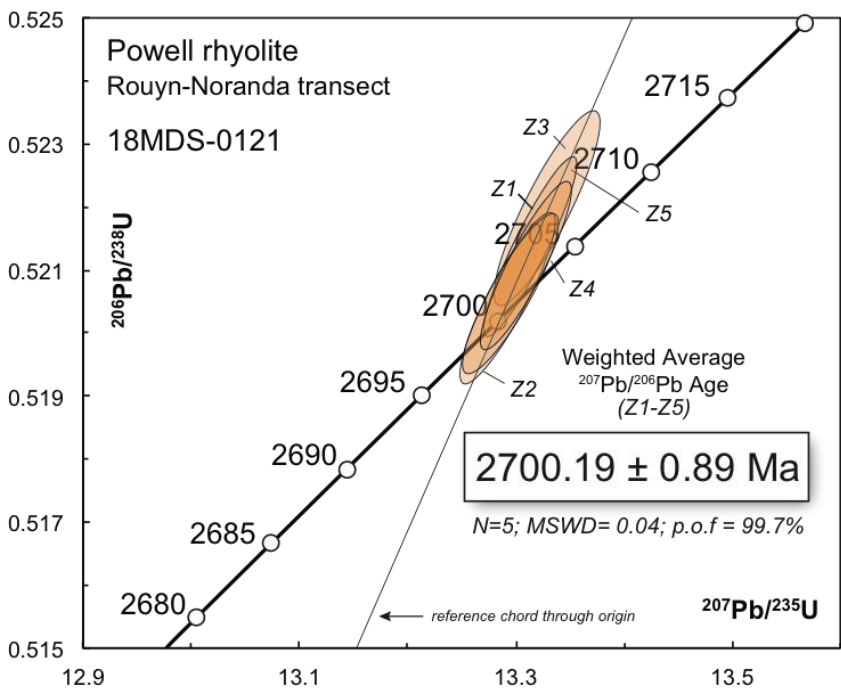
Modified after Morris (1958)

Rouyn-Noranda transect

2019: Resolving details of Noranda Complex igneous stratigraphy

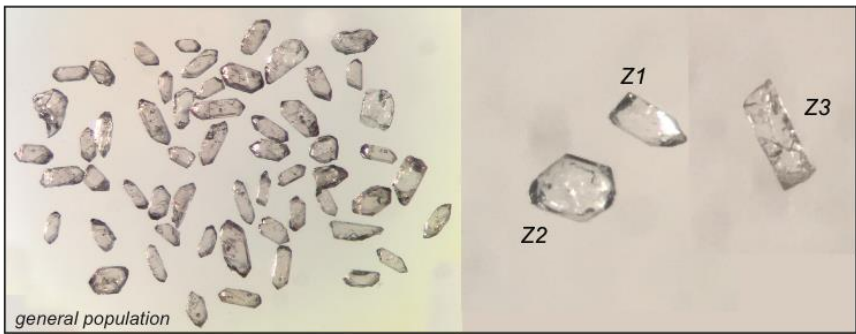
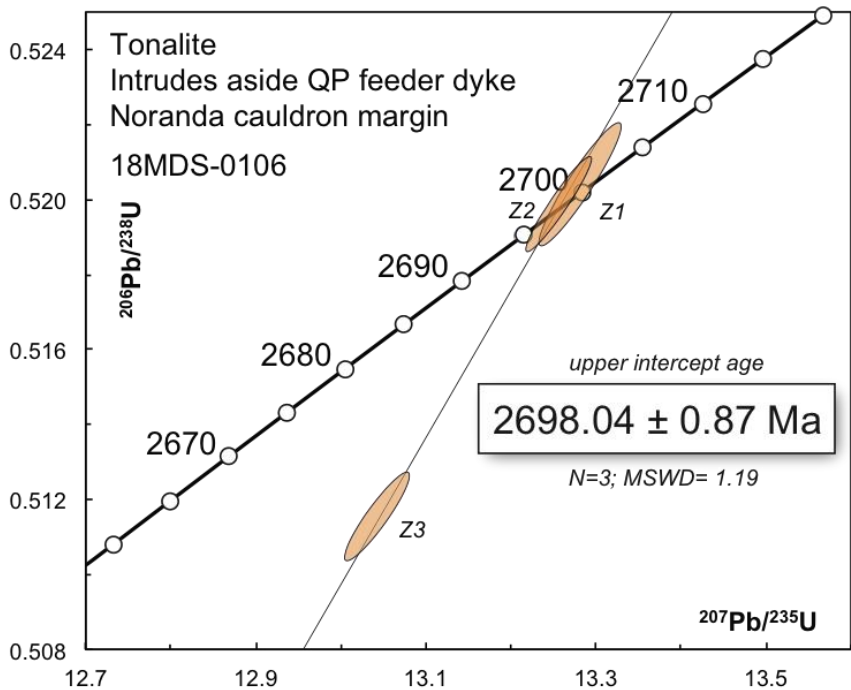
Powell rhyolite (QP)

- Overlies lowermost Brownlee rhyolite, which lacks zircon.



Tonalite

- Unit intrudes alongside the QP Feeder dyke that marks southern margin of Noranda cauldron.
- Should represent some of the youngest activity.

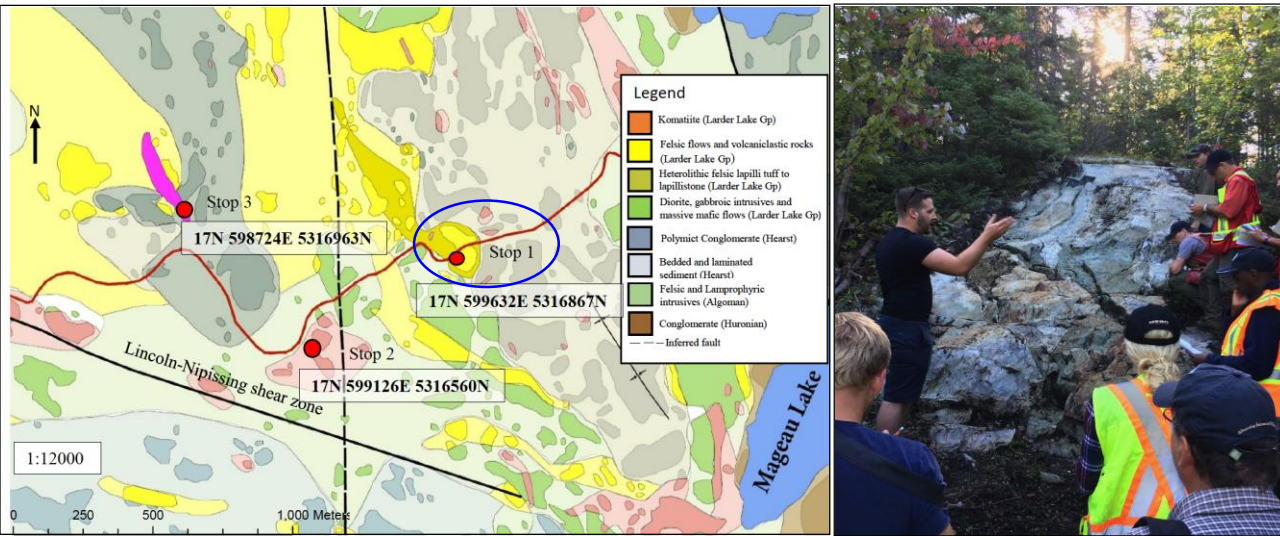


Larder Lake transect

2019: Felsic volcanics, Skead

Felsic volcanoclastic unit, **Larder Lake Group** - north of Lincoln-Nipissing shear zone

➤ 2018 Fall Field Trip, Stop 1: Heterolithic rhyolite lapilli tuff (**Sean Brace**, MSc thesis)

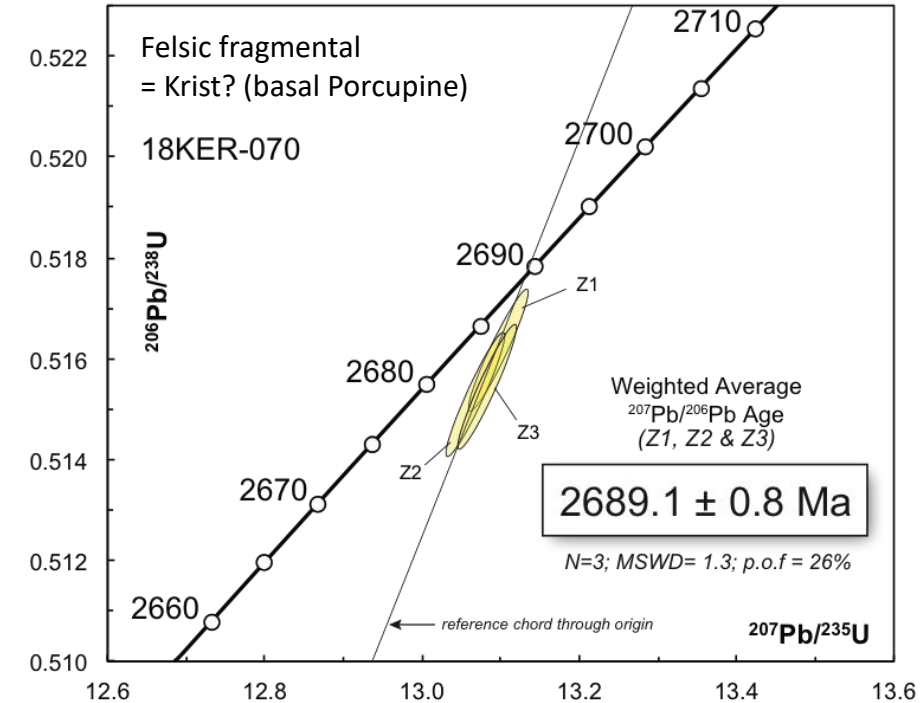


Manly Trench
LNSZ

➤ Krist Fm:

- 2687.5 ± 1.3 Ma
- 2687.3 ± 1.6 Ma
- 2691.0 ± 1.5 Ma

see Ayer et al.,
(2003, 2005)

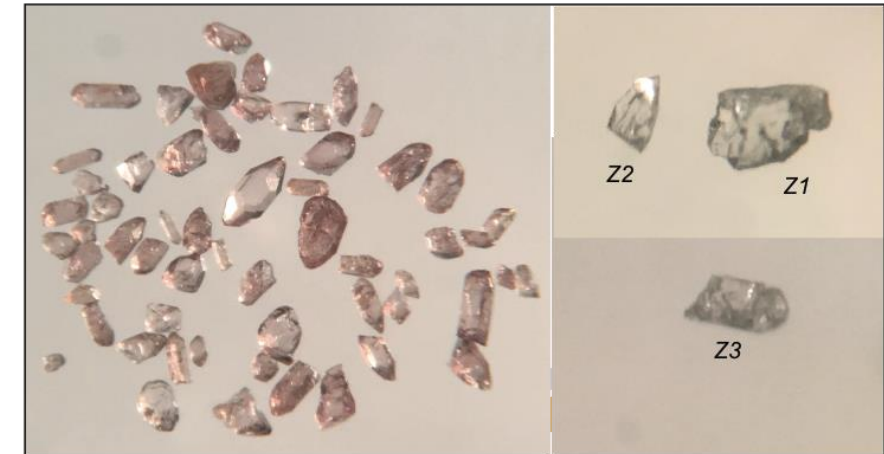


Highly fragmental tuff; raft of komatiite...
Unconformable contact with Hearst assemblage.

Heterogeneous zircon population:

- Z1: 2706.1 ± 1.8 Ma (2s), 1.3% discordant
- Z3: 2702.6 ± 2.1 Ma (2s), 0.2% discordant
- Z2: 2685.9 ± 1.4 Ma (2s), 1.3% discordant

Upper Tisdale: 2706-2704 Ma

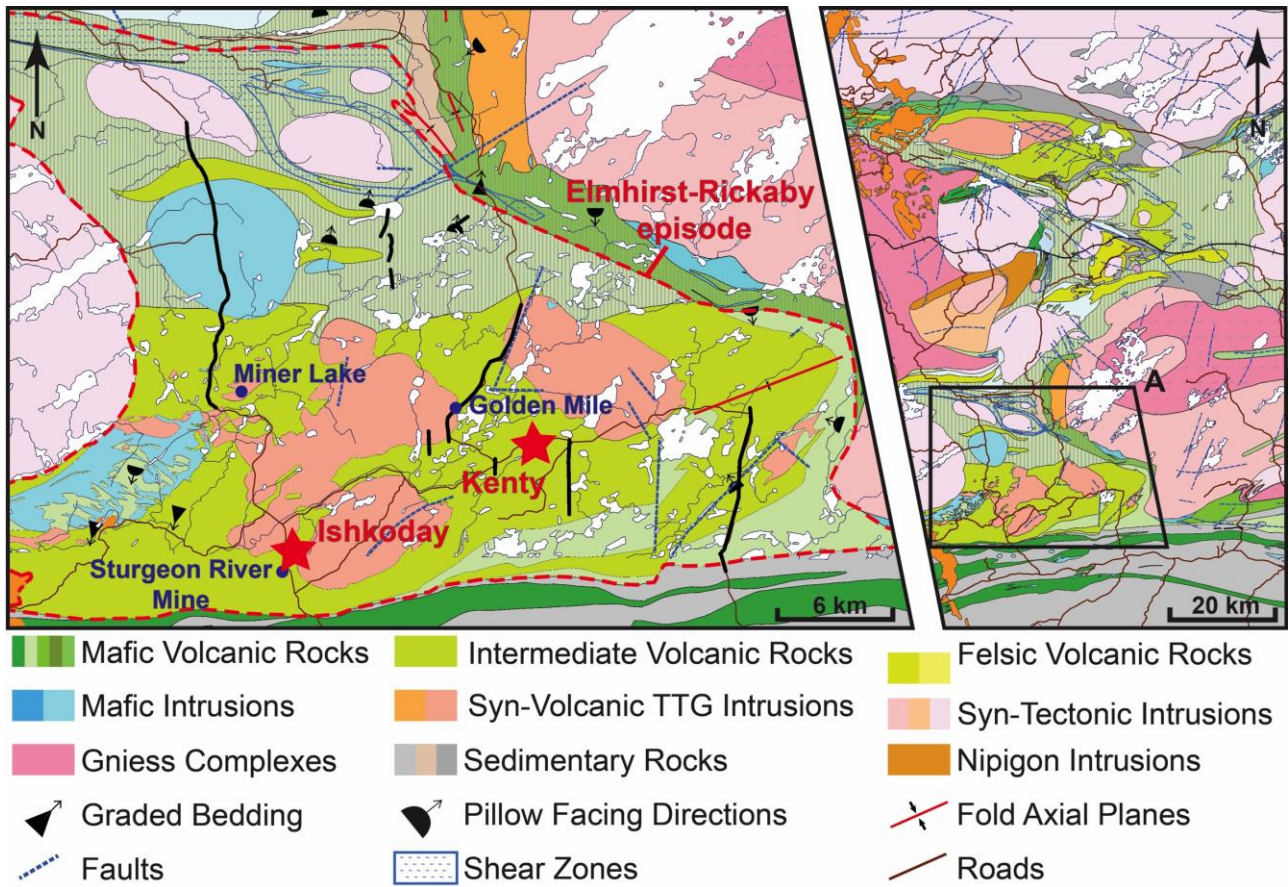


Onaman-Tashota / Eastern Wabigoon transect

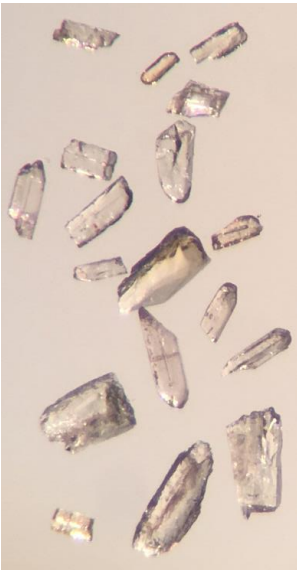
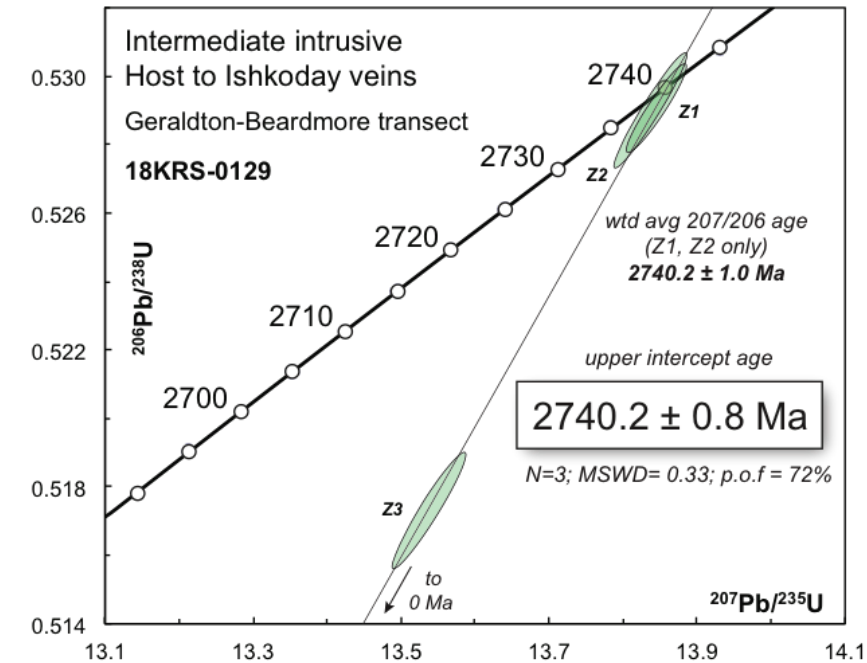
Keaton Strongman (PhD cand., Laurentian U.)

Fine-grained intrusion hosts Ishkoday Mt-Qz-Sph-Ag-Au-W veins; relation to Elmhirst-Rickaby magmatic episode?

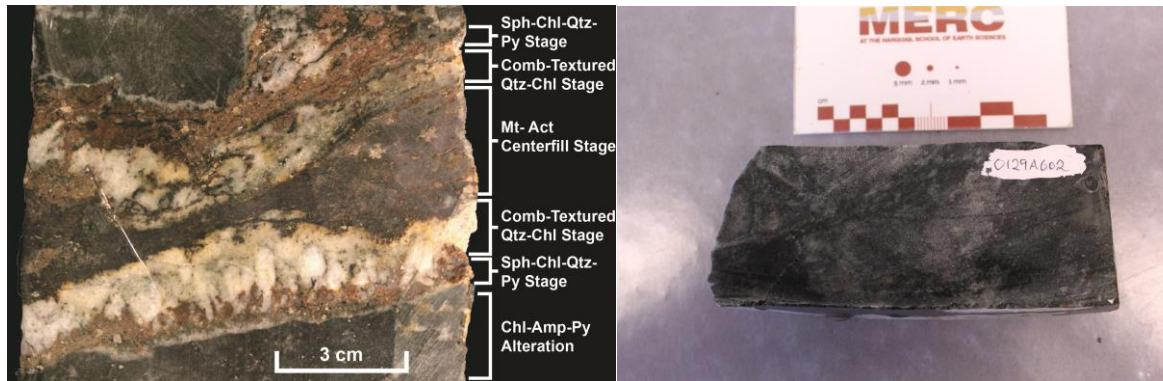
Can we constrain a **maximum age for the mineralization**?



(Modified after Stott et al., 2002)



Elmhirst pluton = 2736.1 ± 1.5 Ma; Kaby pluton = 2734 ± 1 Ma.
Elmhirst-Rickaby dacite = 2740.6 ± 1.1 Ma



Thank you.



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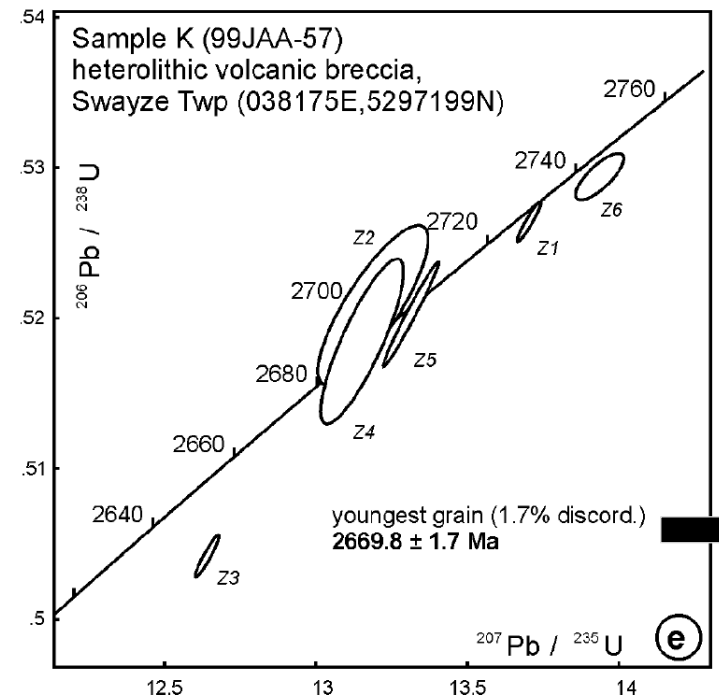
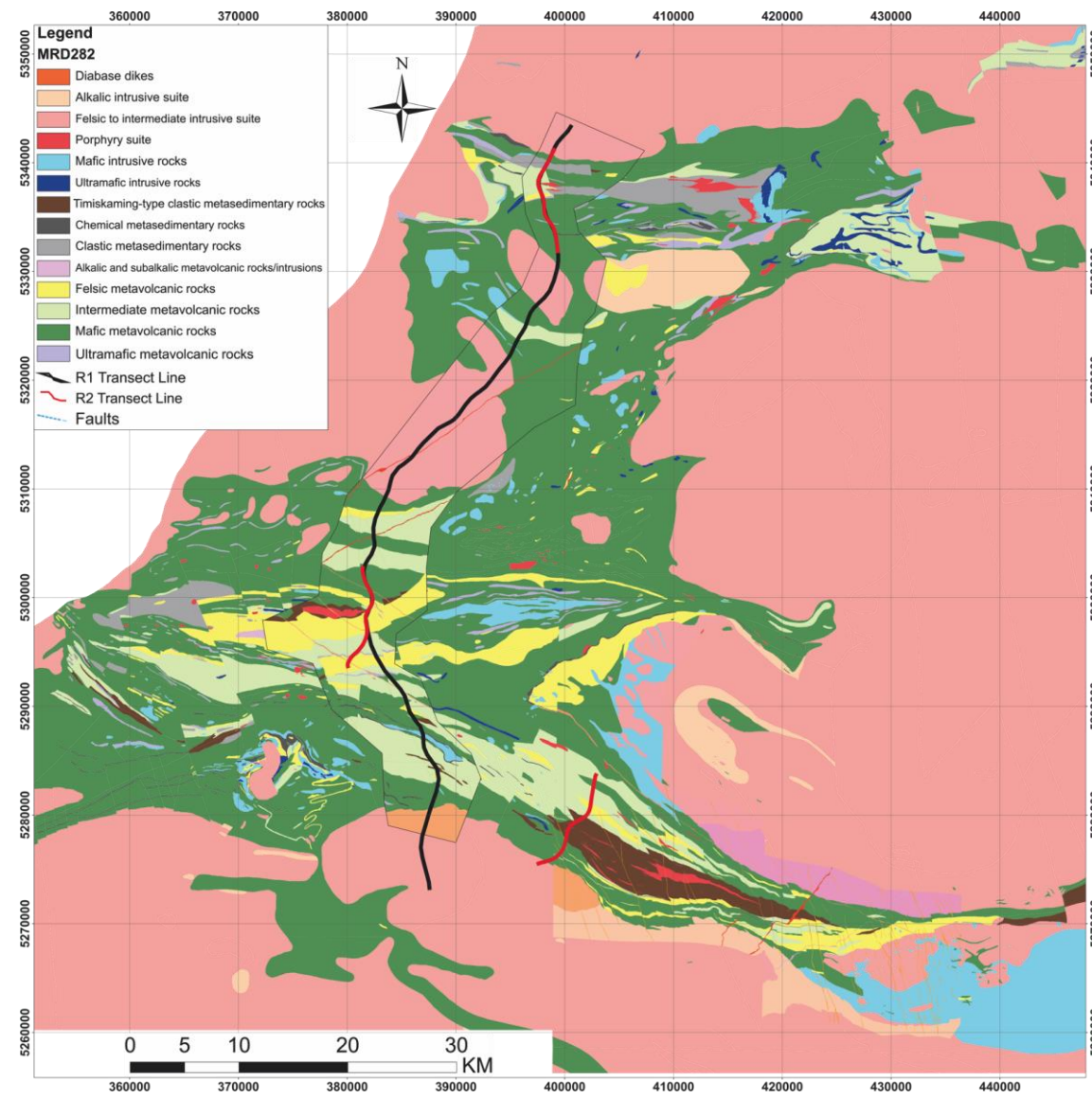


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Swayze transect



A volcanic breccia, near the core of the Brett Lake syncline was sampled to test the age of the uppermost part of this stratigraphic section. The volcanic breccia consists of angular and subrounded fragments, locally with flow laminated red and green feldspar porphyry clasts, set in a gritty matrix. The shoshonitic geochemical signature of this unit (J.A. Ayer, OGS, unpublished data, 1999) suggests that it may be of Timiskaming age.

