



Whole Rock $\delta^{18}\text{O}$ and $\delta^2\text{H}$ Isotopic Footprint of the Canadian Malartic Deposit, Malartic, Québec

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1) Introduction

The Canadian Malartic deposit is a world class Au resource containing an estimated 10.1 Moz of Au. Located in the Superior province of Québec the Malartic deposit is located in Malartic approximately 30 km West of Val d'Or and is dominantly hosted by the metasedimentary Pontiac group (Fig 1) [1]. Mineralization trends subparallel to both the dominant foliation in the Pontiac metasediments and the Slaven fault [2]. The Sladen fault is a splay of the well endowed Cadillac-Larder Lake fault system, located within the Pontiac group and near the contact with the mafic to ultramafic rocks of the Piche group. This structure also coincides with the northern extent of this massive Au deposit.

2) Research Goals

The CMIC-EIC footprints programme is focused on creating multi-parameter, integrated ore deposit models at the largest possible scale. These models will characterize the potential exploration target for each deposit type. As part of the disseminated Au subproject, this research aims to define the footprint of the Canadian Malartic deposit in terms of whole rock O and H isotope composition. The research make use of a gridded array of existing drill core samples provided by Osisko. Isotopic data from select drill locations (black dots Fig 2) as well as from outcrops will be used to define an isopleth map around the Malartic deposit. The data used in the making of this map will provide insight into the fluid flow dynamics related to mineralizing system.

3) Research Methods

3.1) Sample Selection

Analysis of select samples is currently underway at the Queen's facility for isotope research in Kingston, ON. These samples have been taken from a transect out from the Malartic pit and are part of Osisko's existing library of drill core samples. Consequently, these samples contain quartz carbonate veining which will contribute to the "noise" exhibited by the isotope data. These data will be compared to "clean" samples free from secondary veinlets from the same locations. In this orientation survey, image analysis software along with the database of drill core photos will be used to estimate and subtract the effects of secondary veining and in turn, assess the usefulness of the existing sample library for this type of work.

3.2) Future Work

Samples free from quartz veins will be analysed for O and H isotope composition in the spring of 2014. Results ascertained from these as well as the the array of Osisko's drill holes will indicate the extent of ground which needs to be covered in order to define the Malartic deposit's footprint. Field work for the Summer of 2014 will include mapping and the collecting of complimentary outcrop samples both proximal and distal to the Malartic pit.

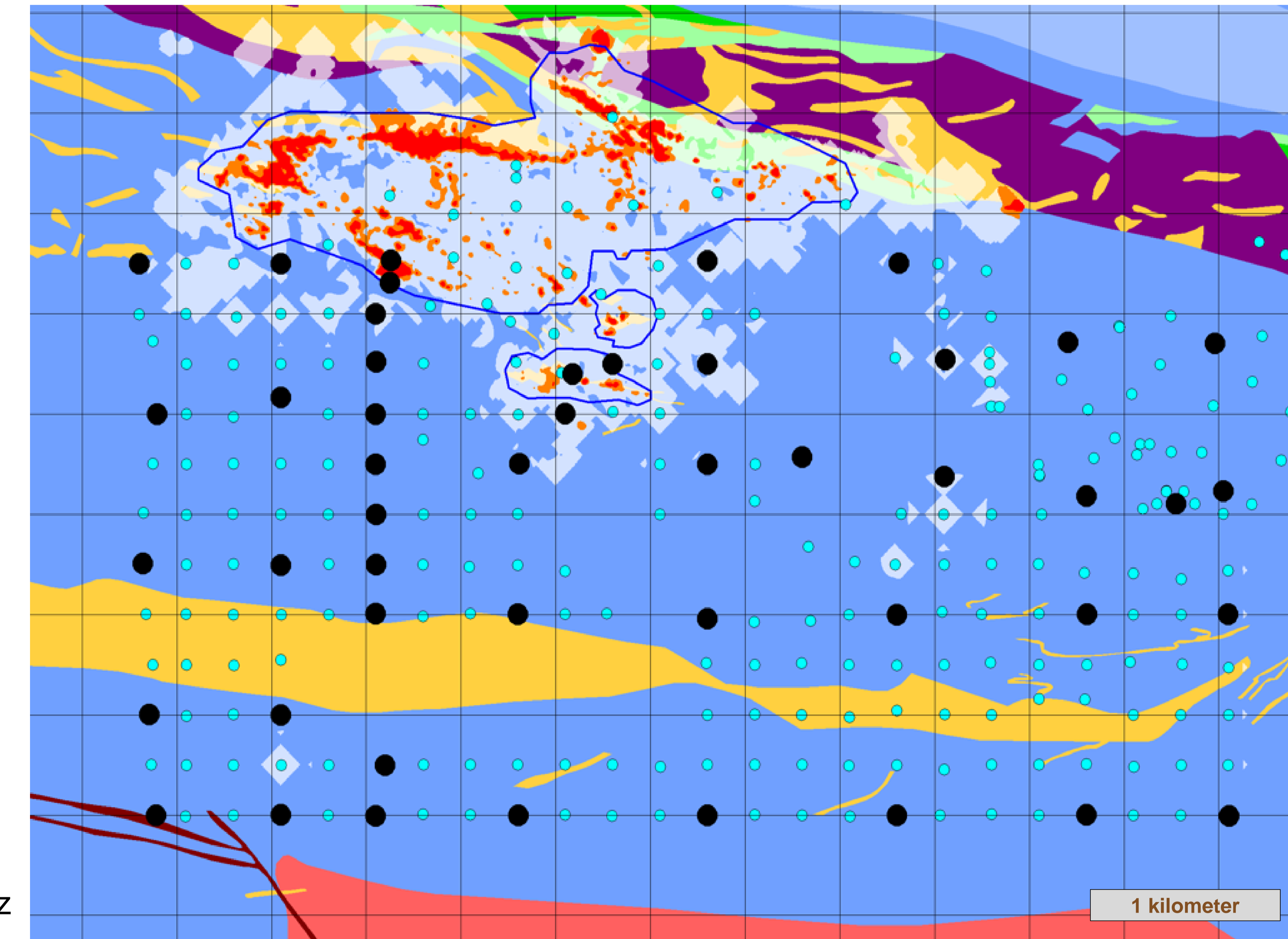


Figure 2

4) Discussion

For scientific purposes the samples free from quartz veins will provide the best whole rock isotopic data for defining the footprint of the Malartic deposit. While these samples are being used by other researchers working on the Malartic subproject, Osisko's library of drill core samples is being tested to determine its applicability for this type of work. The benefit of using existing drill core samples allows this work to be easily applied elsewhere. Developing a method to re-utilize data from existing sample libraries should provide new opportunities for mineral exploration. Further means are being taken to ensure the applicability of the data used in this study. Overall, results from studying the isotopic footprint of the Malartic Au deposit will aid in defining the largest possible exploration target.

5) Acknowledgments

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References

[1] Helt, K., et al., (2014) Economic Geology v. 109 p. 713-735 [2] CMIC Au Field workshop Program (2013)

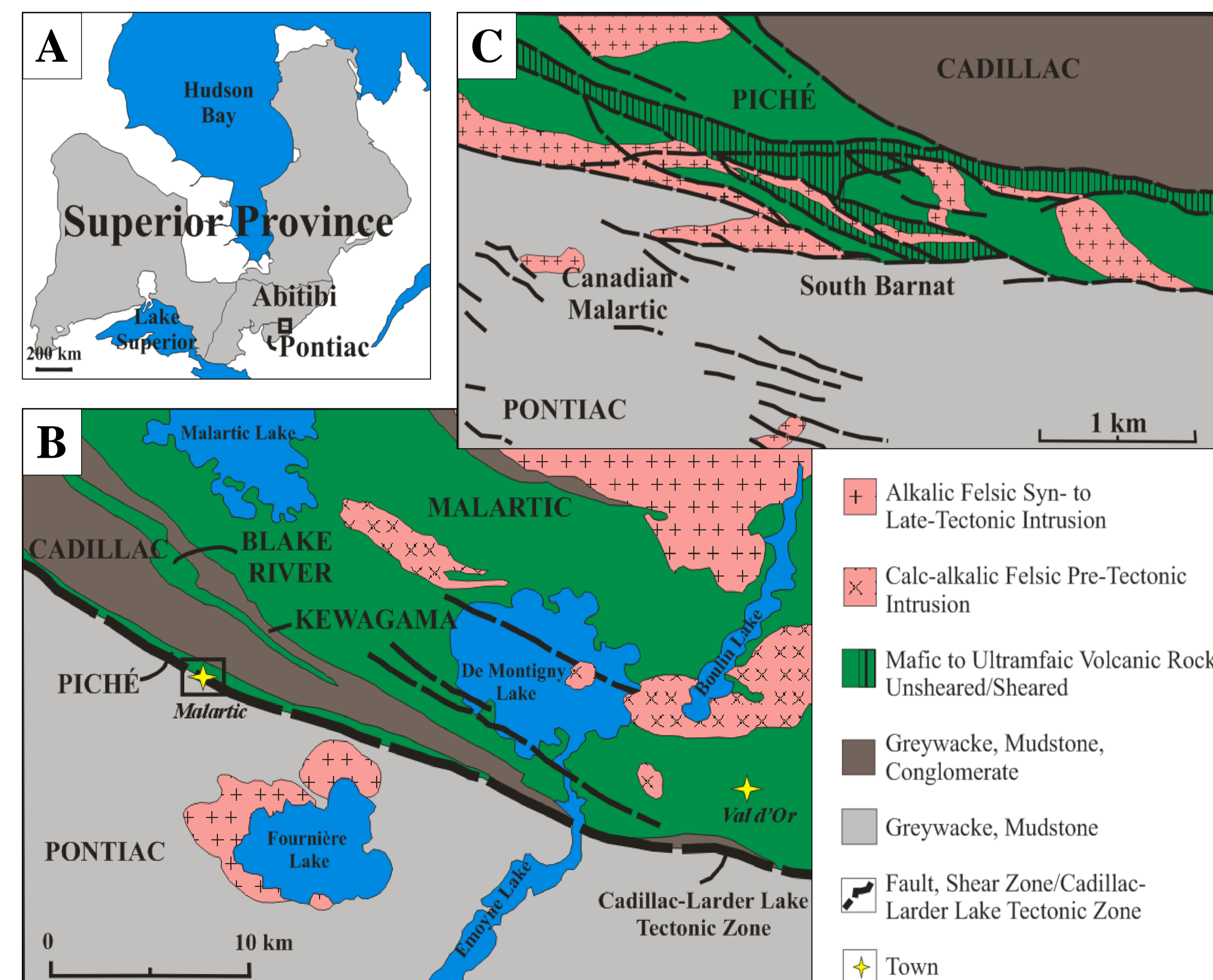


Figure 1