# Minéralisations hydrothermales Au - W associées à des dykes de syénite: le projet Dolodau – secteur de Chapais, Abitibi

Damien Gaboury, Christina Thouvenot, Gabrielle Varieras, Yann Bureau et Frank Guillemette

**23 Mai 2017**

Mitacs

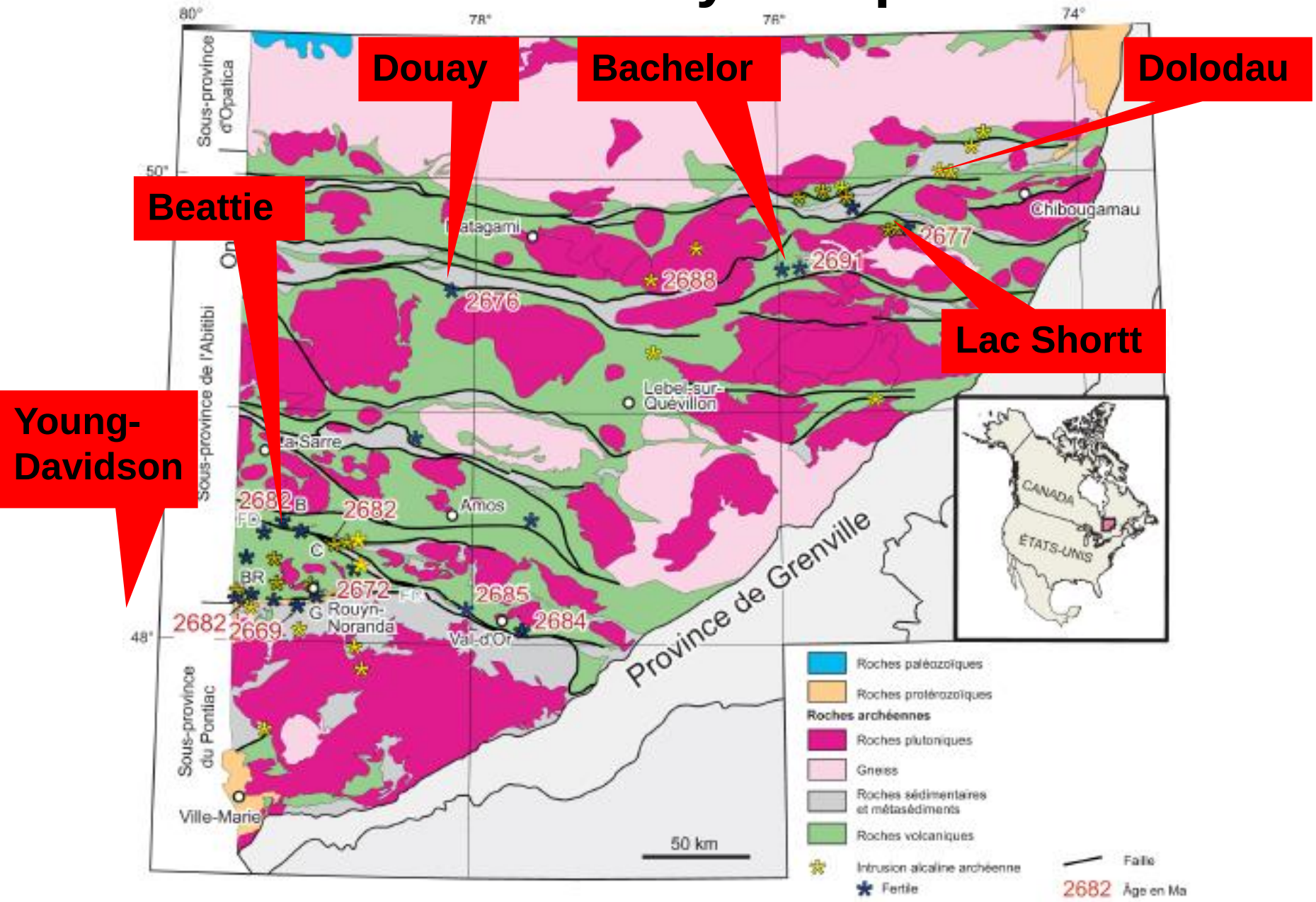
15e FORUM TECHNOLOGIQUE
CONSOREM - DIVEX

MRB
MULTI-RESSOURCES BORÉAL

UQAC
Université du Québec à Chicoutimi

LAMEQ
LABORATOIRE DE MÉTALLOGÉNIE EXPÉRIMENTALE ET QUANTITATIVE

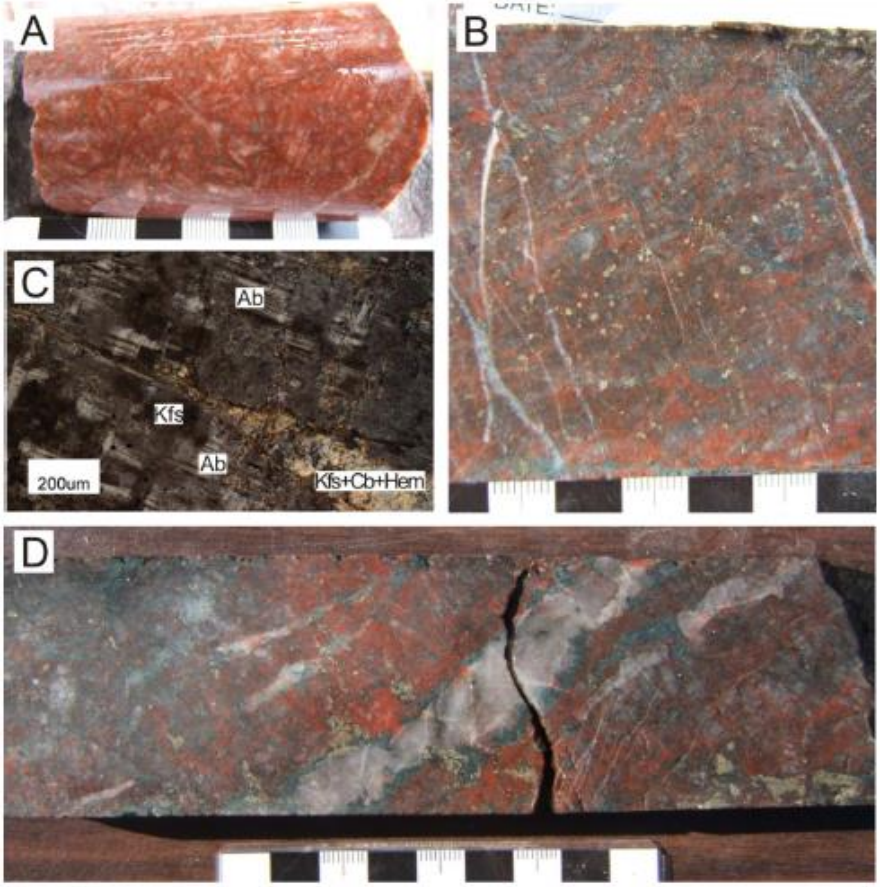
# Intrusion alcaline – syénitique en Abitibi




Lagault et Lalonde, 2009: MRNQ, PR-2009-04

# Style: Aspect rouge brique, Py disséminée

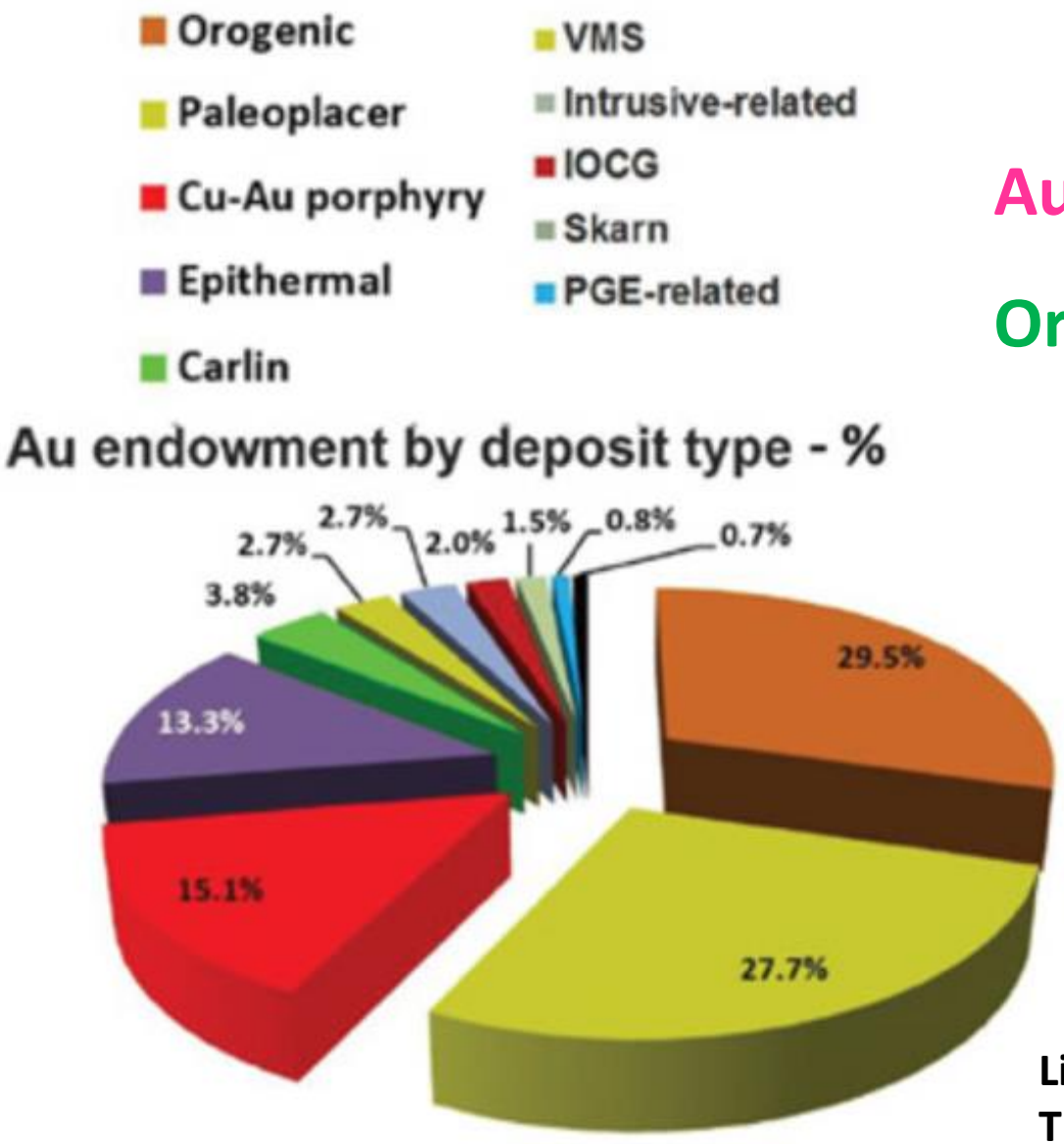
## Young-Davidson - Abitibi, Ont




## Bachelor - Abitibi, Qc

Martin, 2012: MSc U. Waterloo

# Grande question: Au est-il magmatique ?



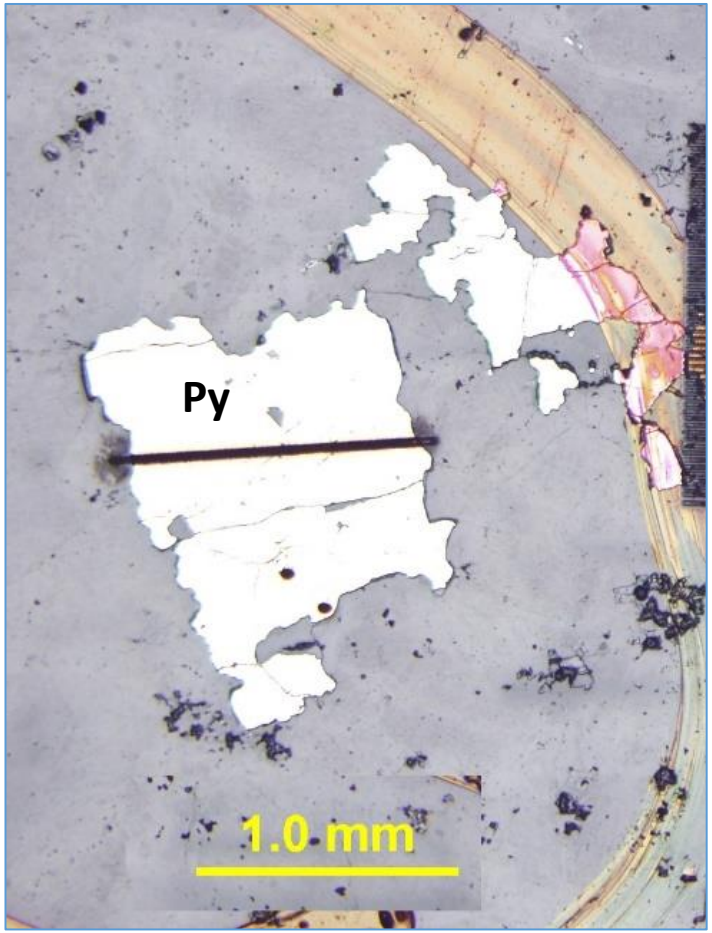

**Au – intrusion: 1,5%**

**Orogénique: 29, 5%**

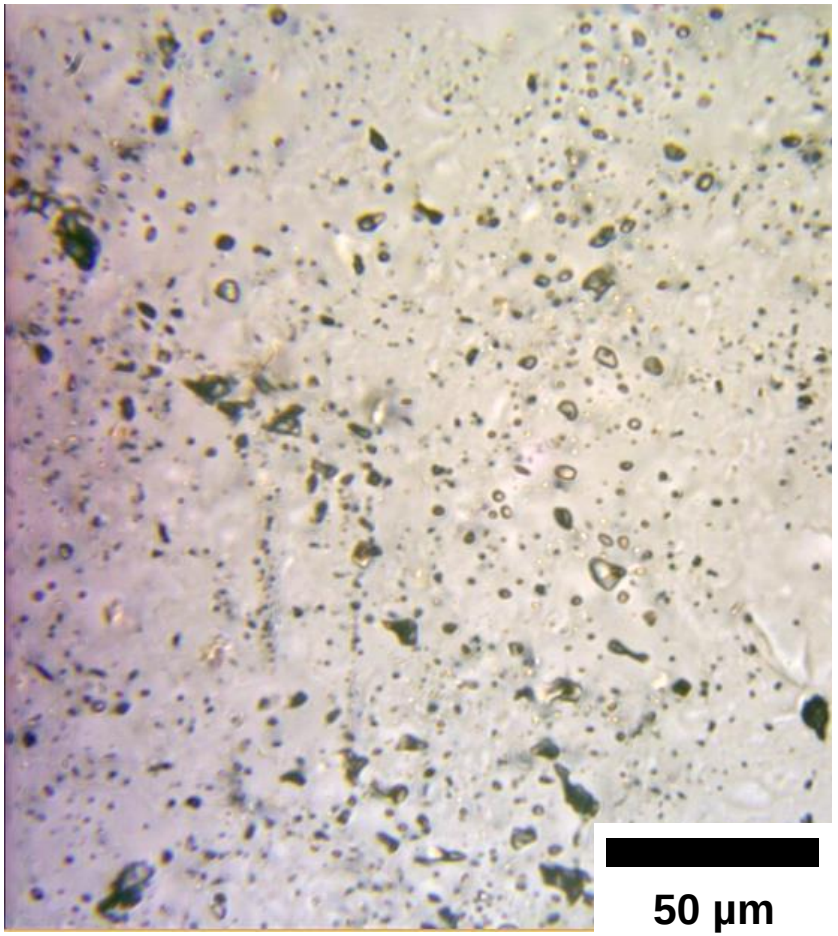
**Lipson, 2014 – SEG Newletter**
**The data is current as of October 2011**

# Si Au magmatique…

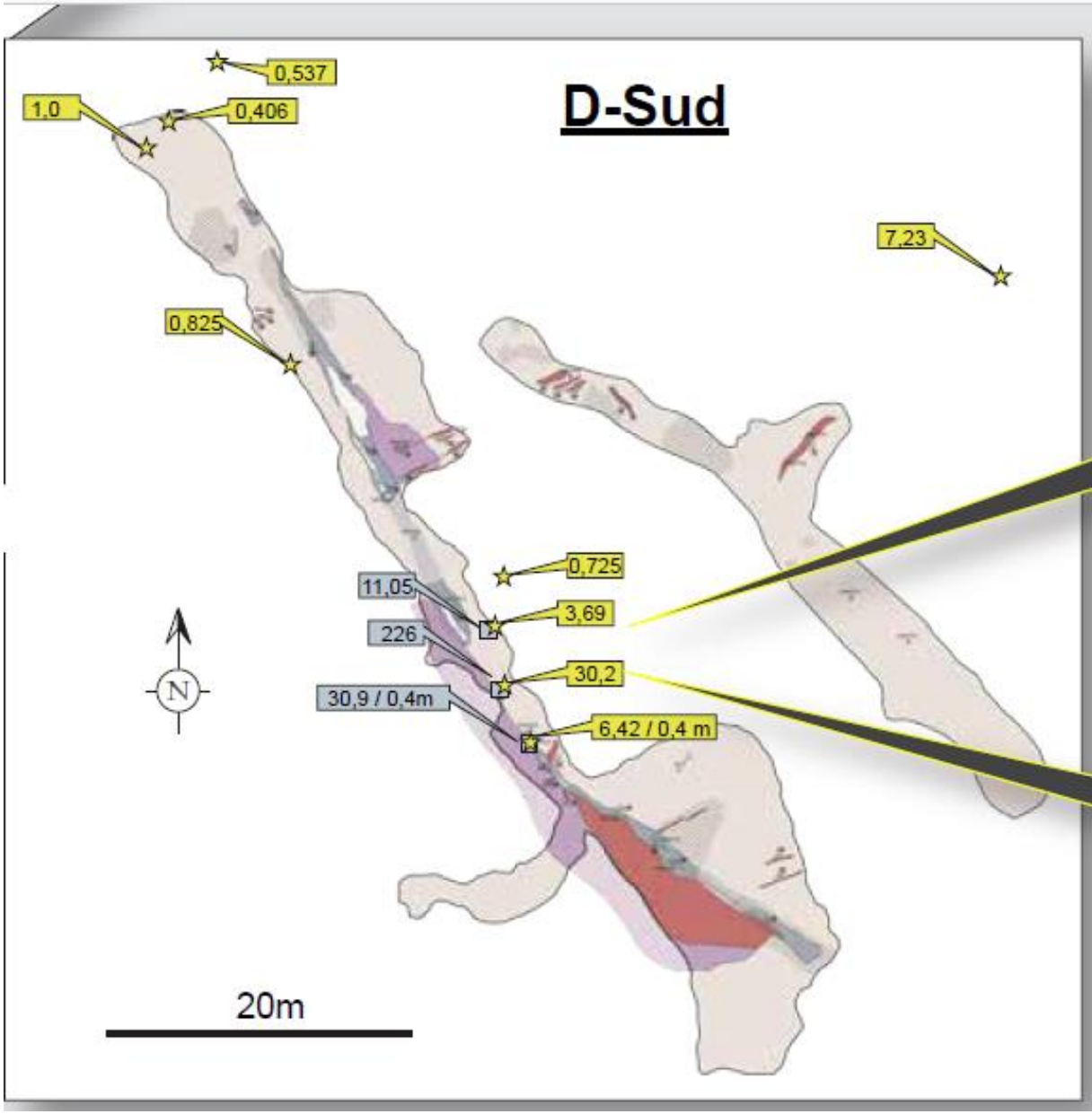
Signature métallique avec métaux granophiles ?

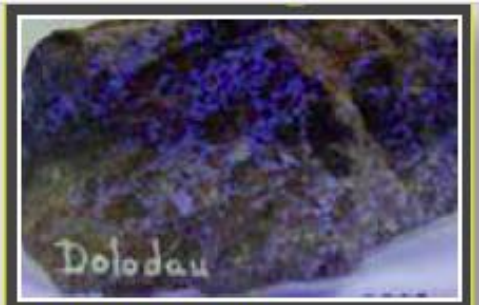



Signature en volatils des fluides distinctes ?



# Pourquoi Dolodau ?



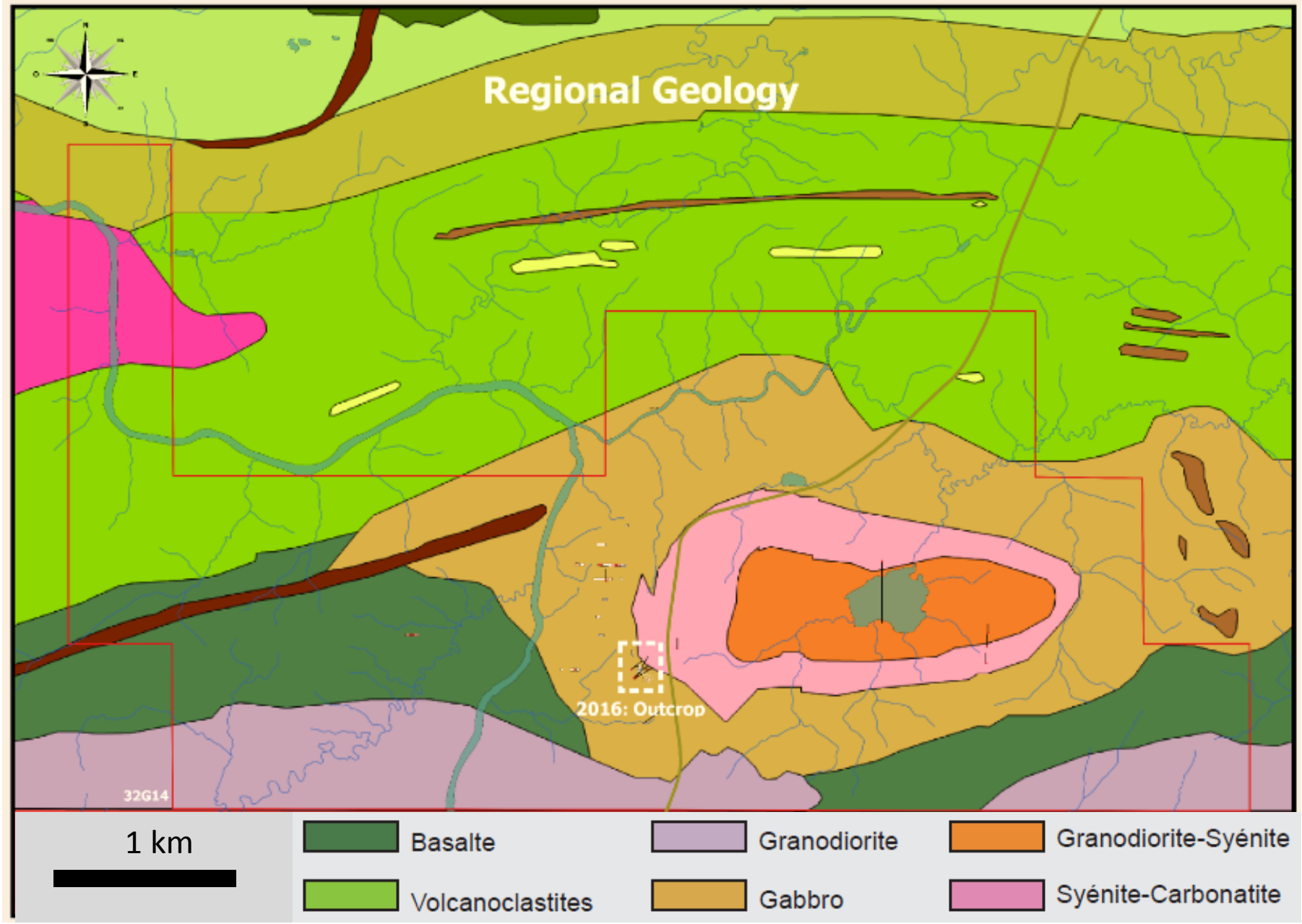




Grab à 13,2% $WO_3$
Sheelite sous lampe UV, 2016

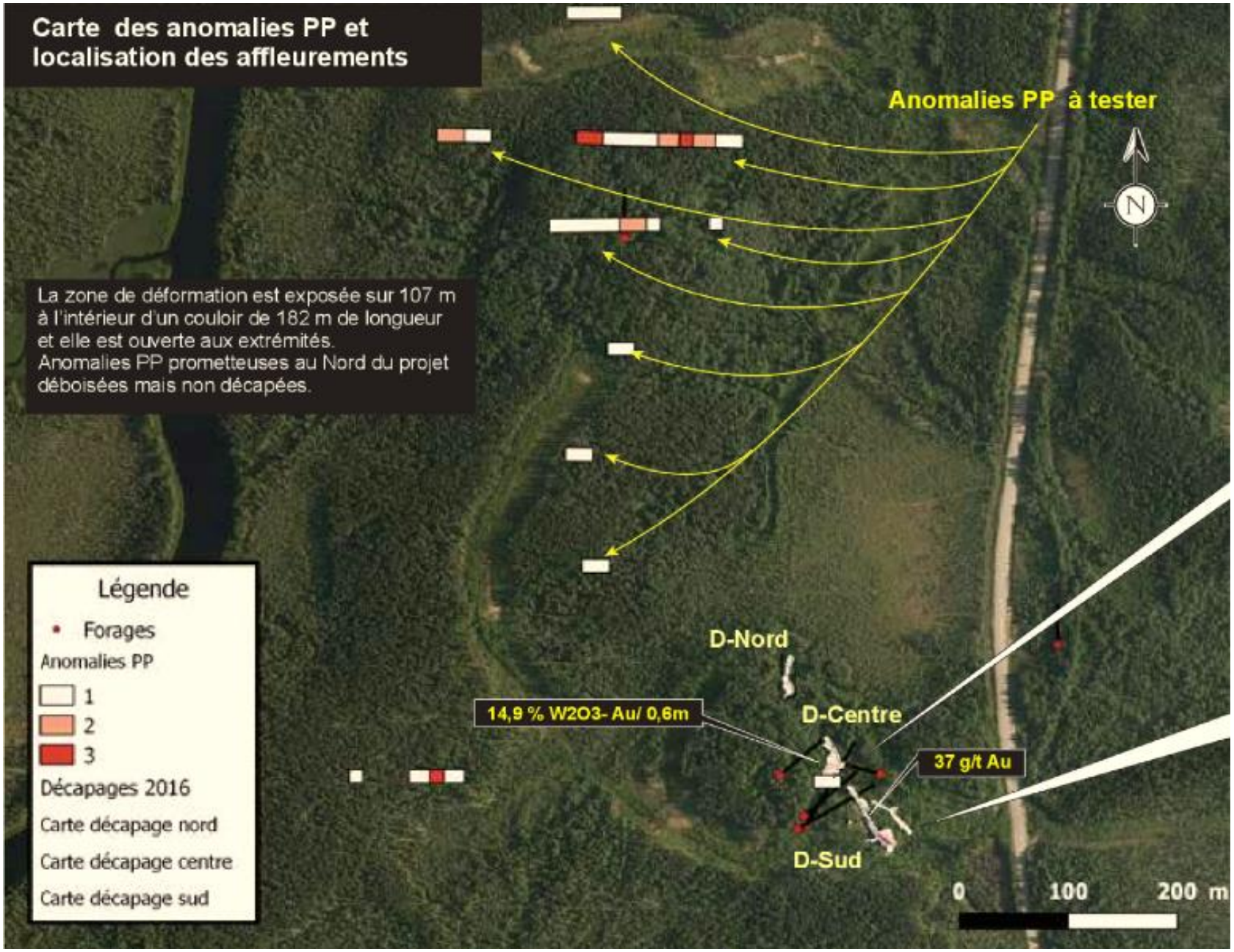
15,9 g/t Au + 95,1 g/t Ag
juillet 2016

30,2 g/t Au + 226 g/t Ag
juillet 2016

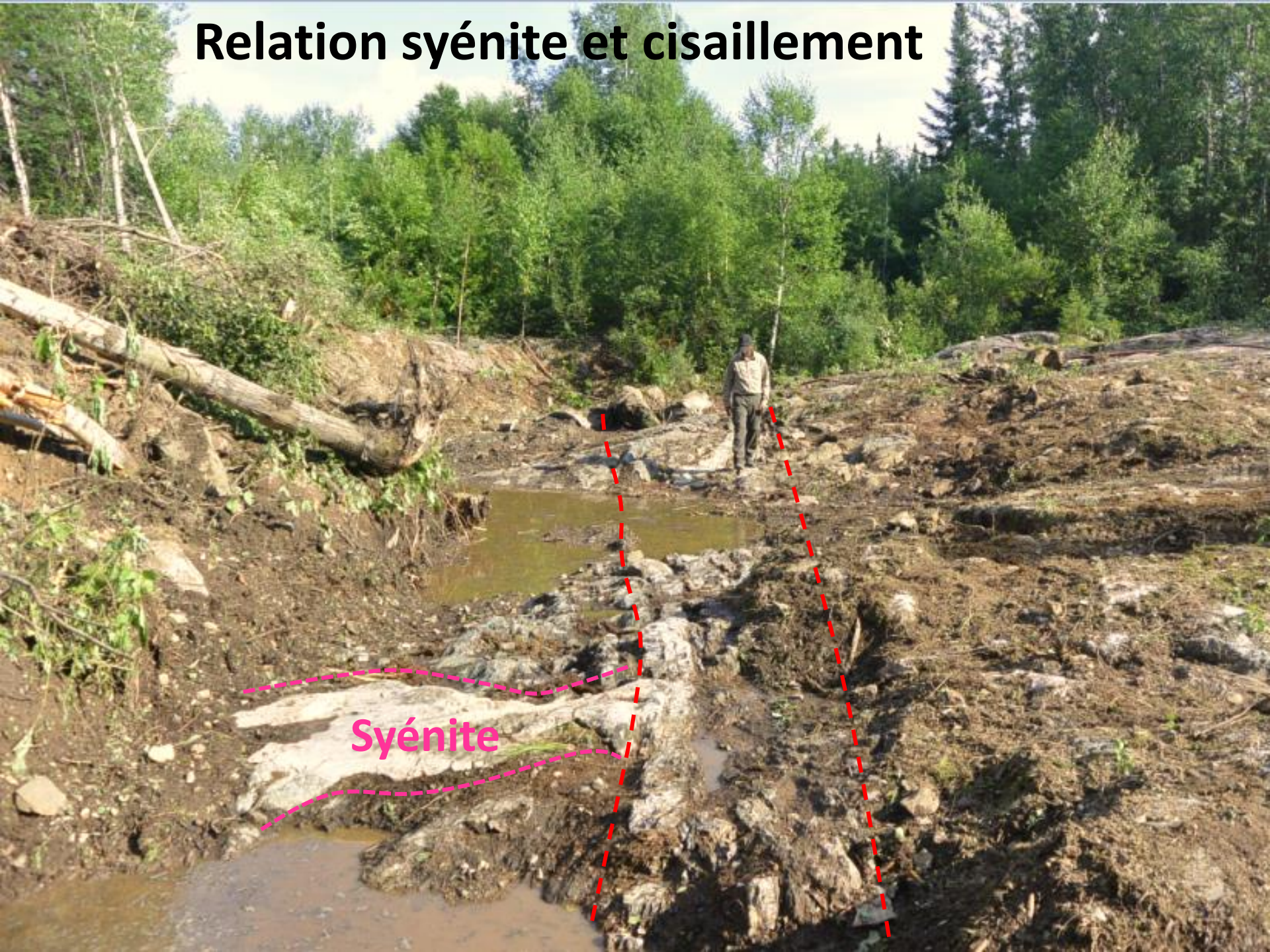
# Contexte géologique (modifié du SIGEOM)



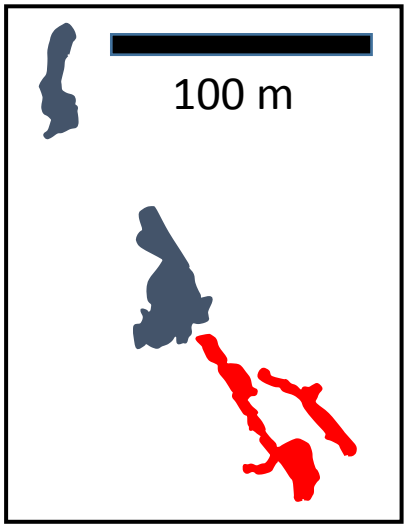
# Travaux d'exploration et décapages

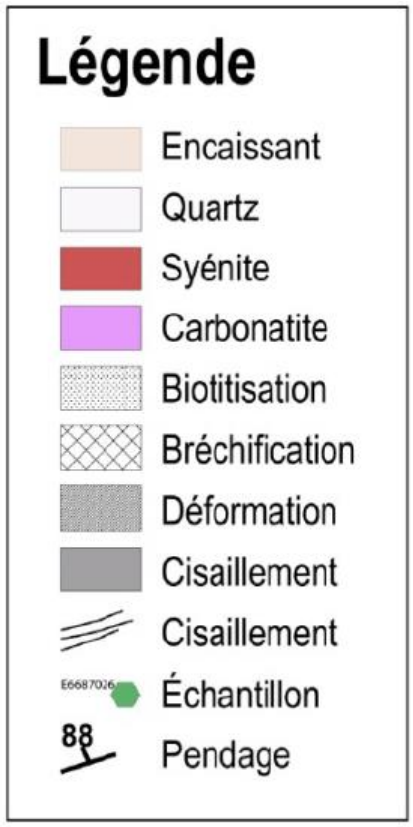


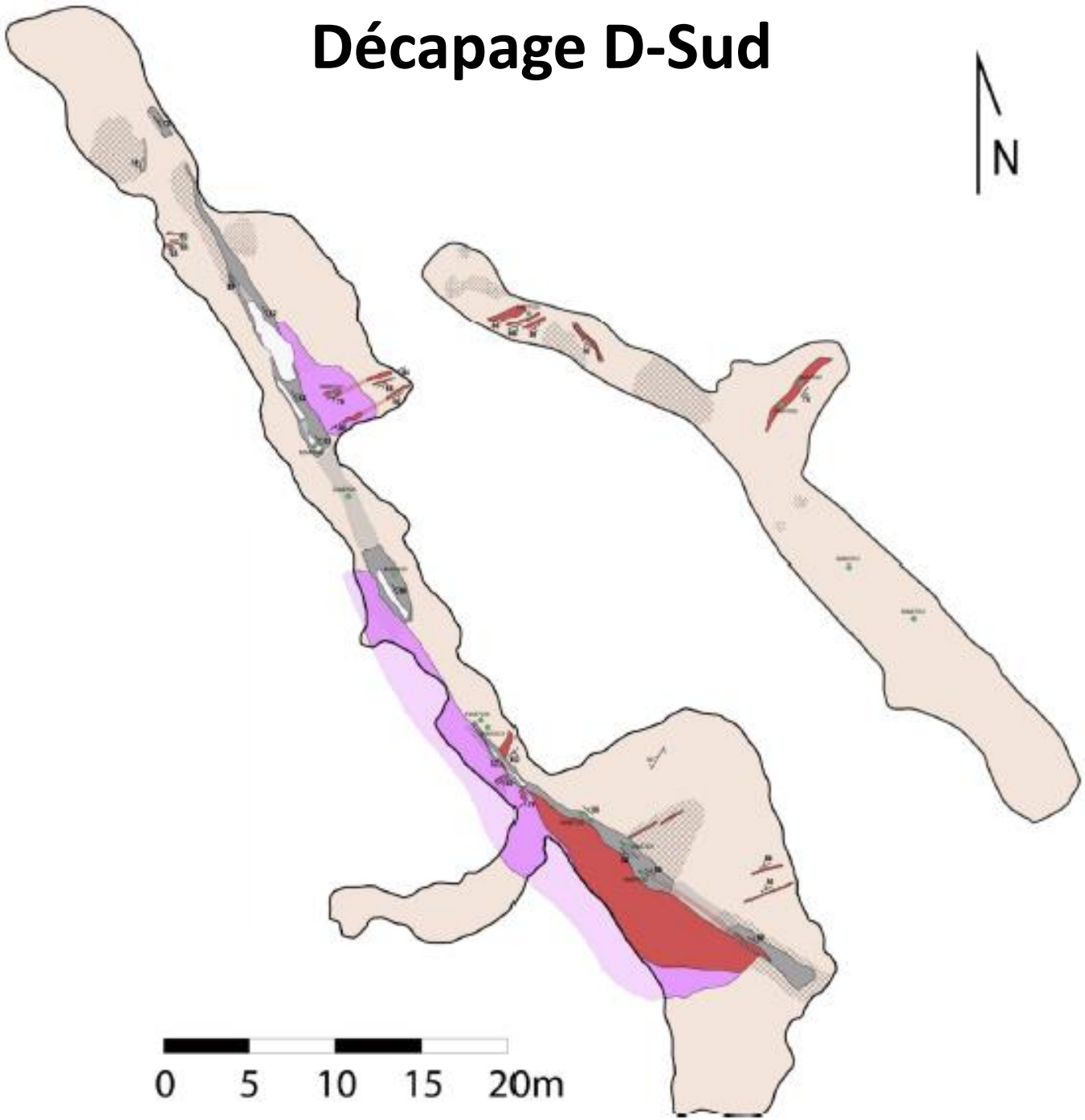
# Relation syénite et cisaillement



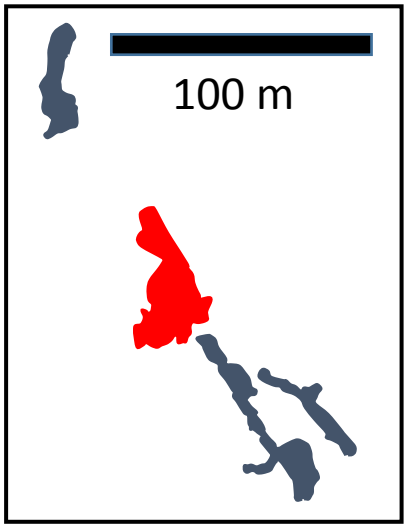
# Décapage D-Sud

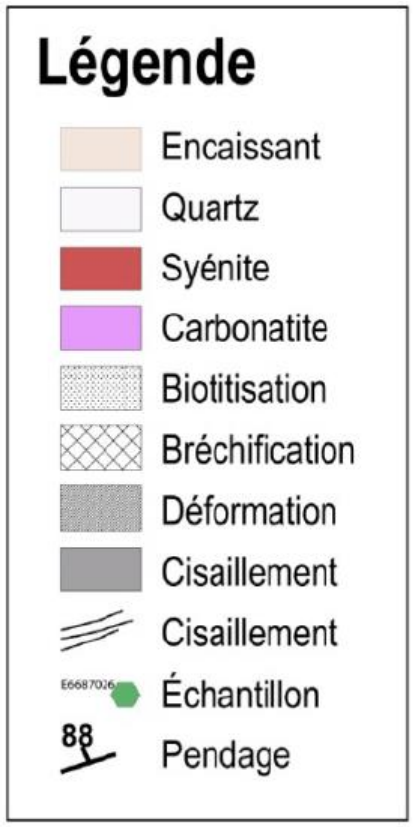


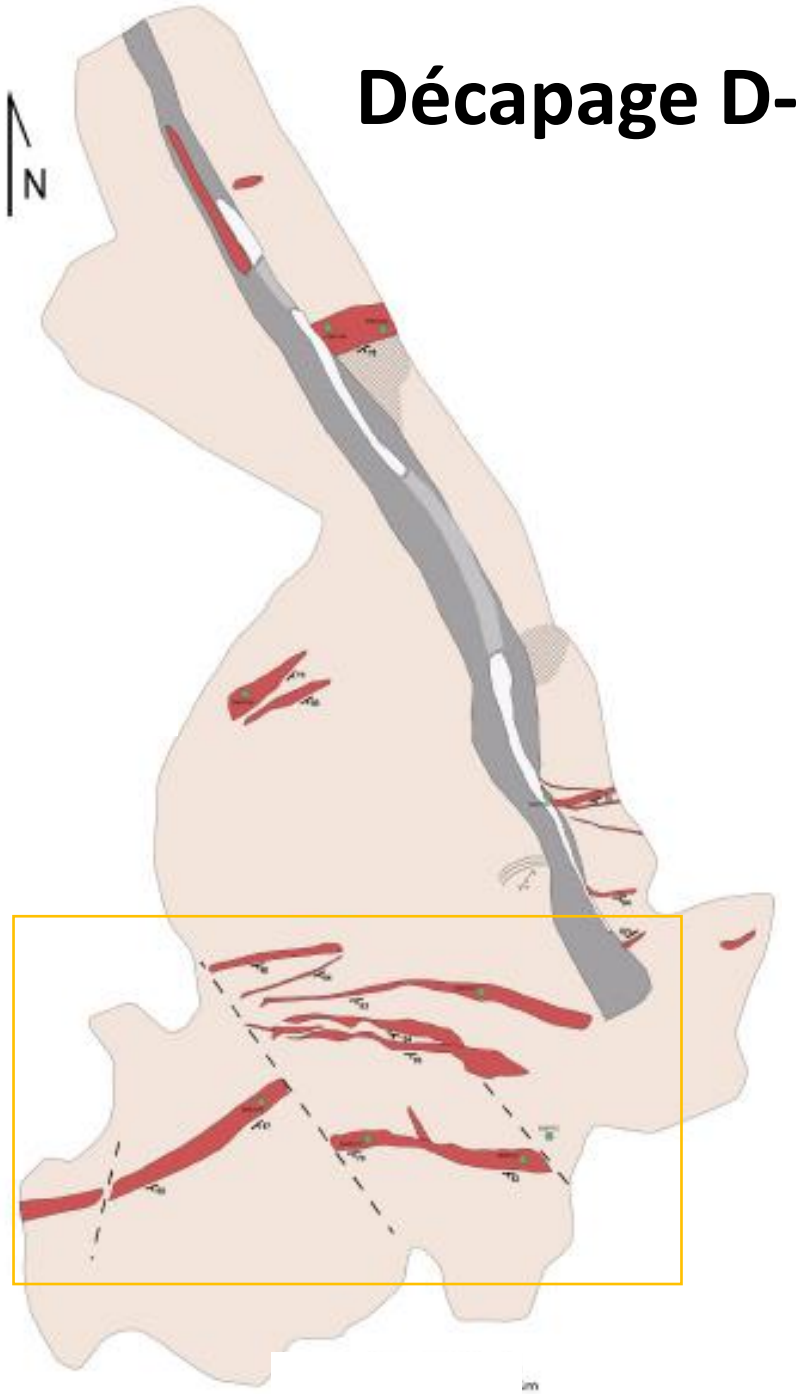



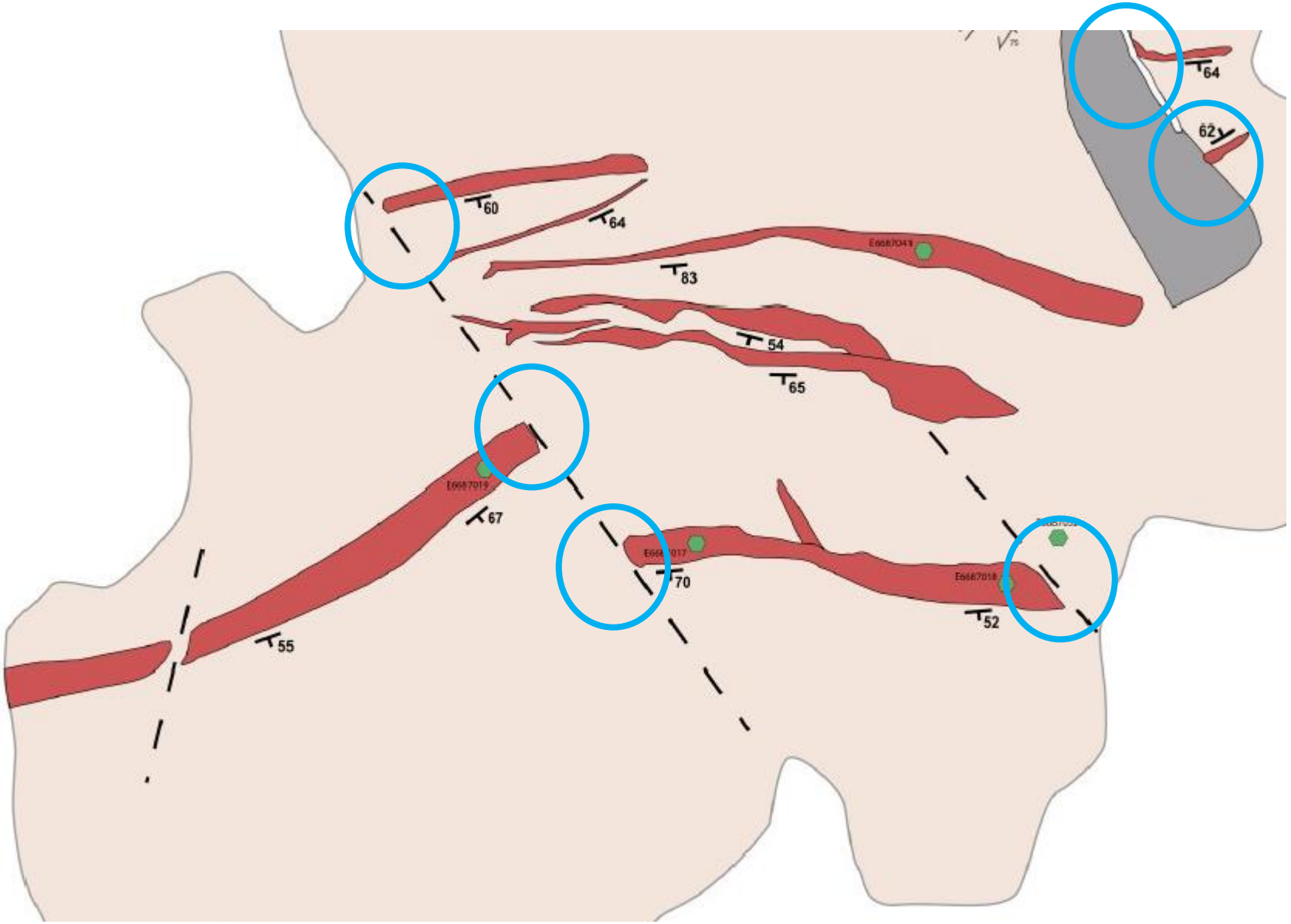
# Décapage D-Centre



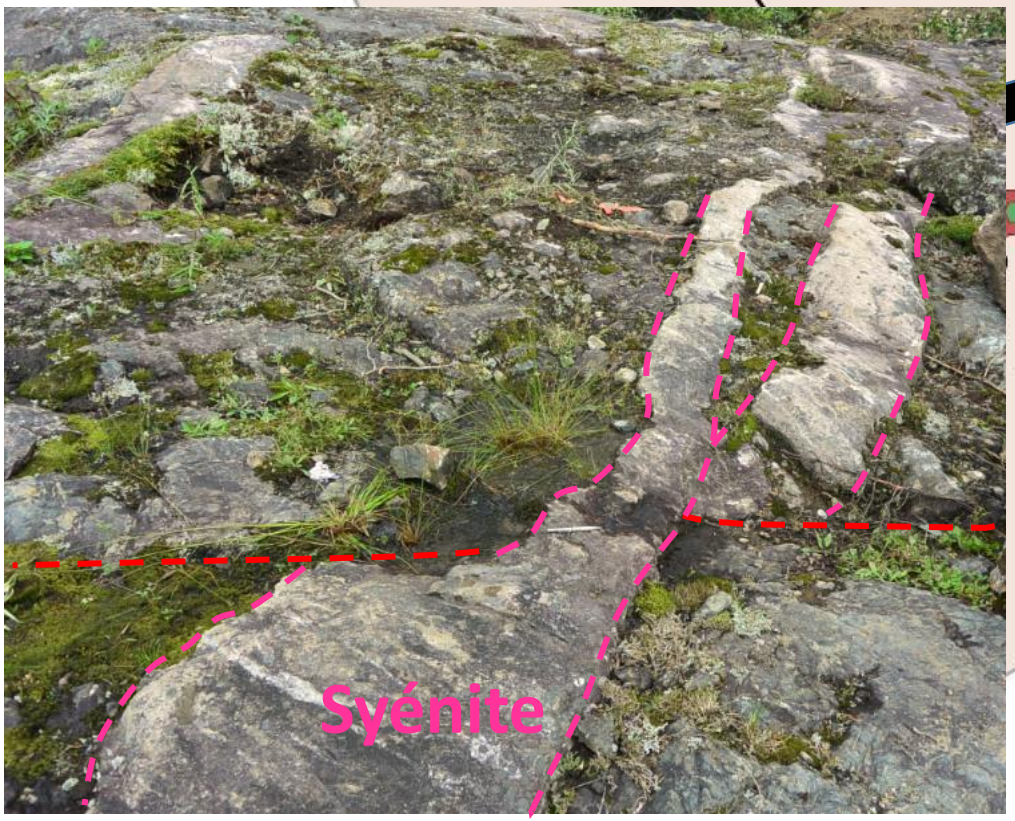



# Dykes recoupés par cisaillements NNW-SSE

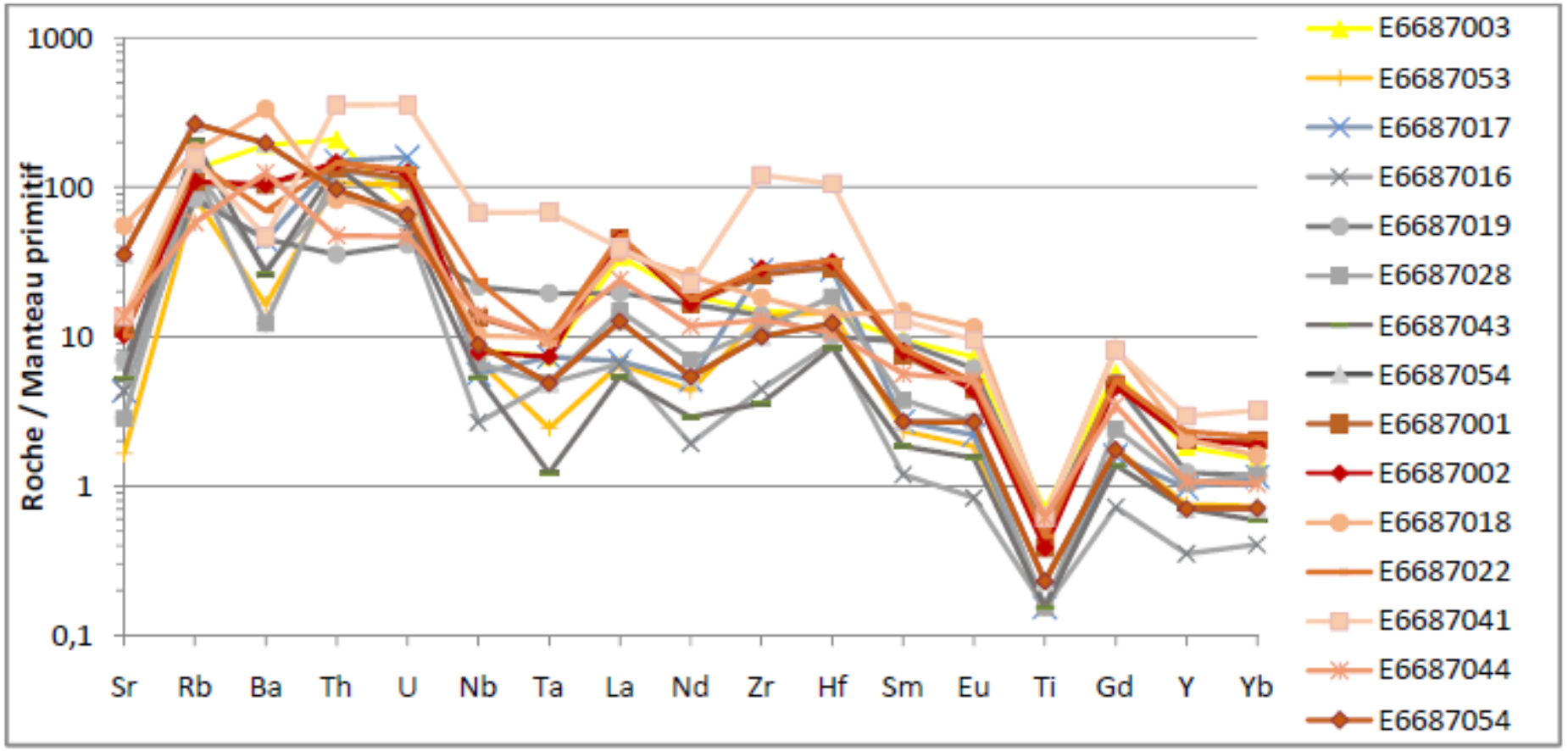


# Synchronisme en injection des dykes et les cisaillements

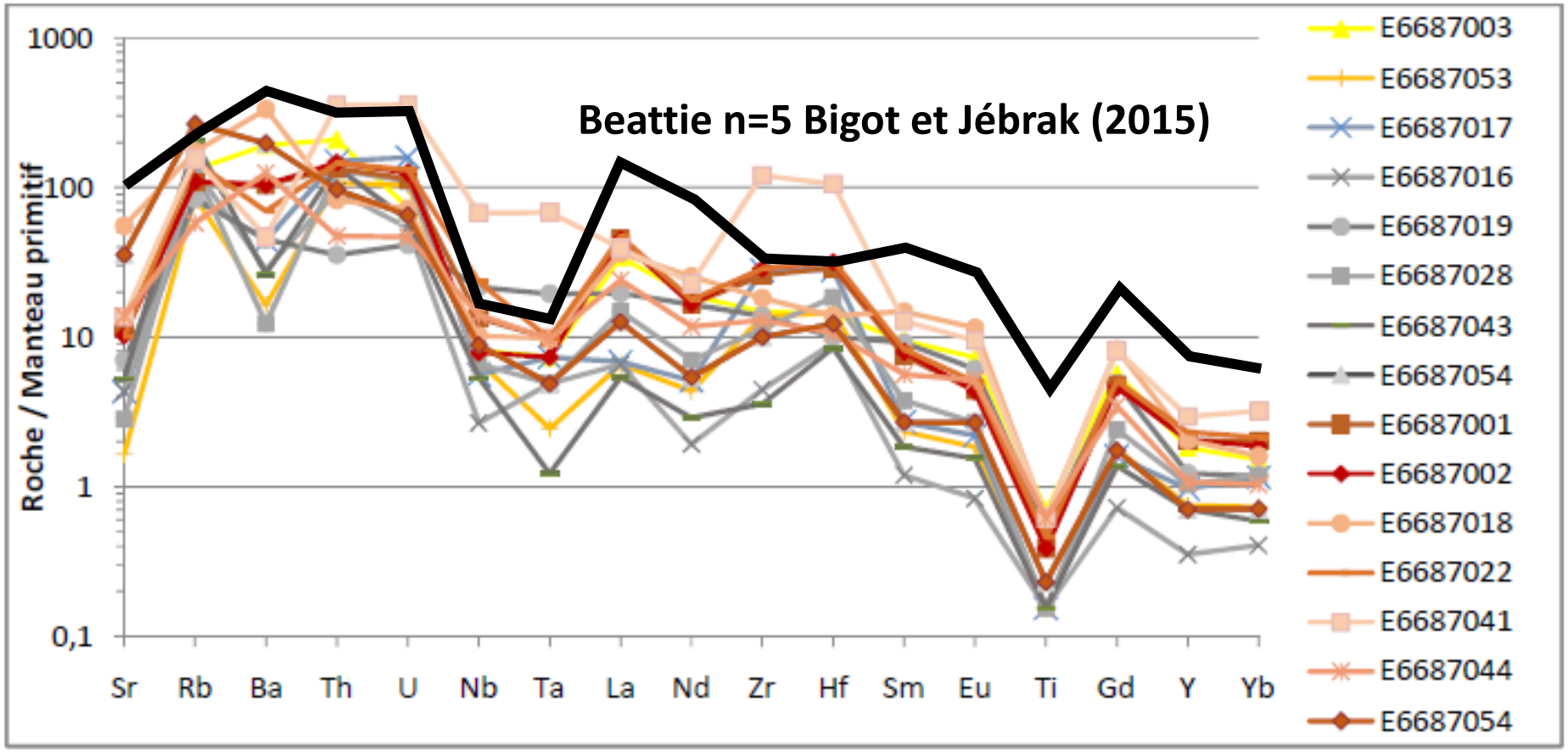


# Les dykes syénitiques pyriteux

# Signature syénitique des dykes



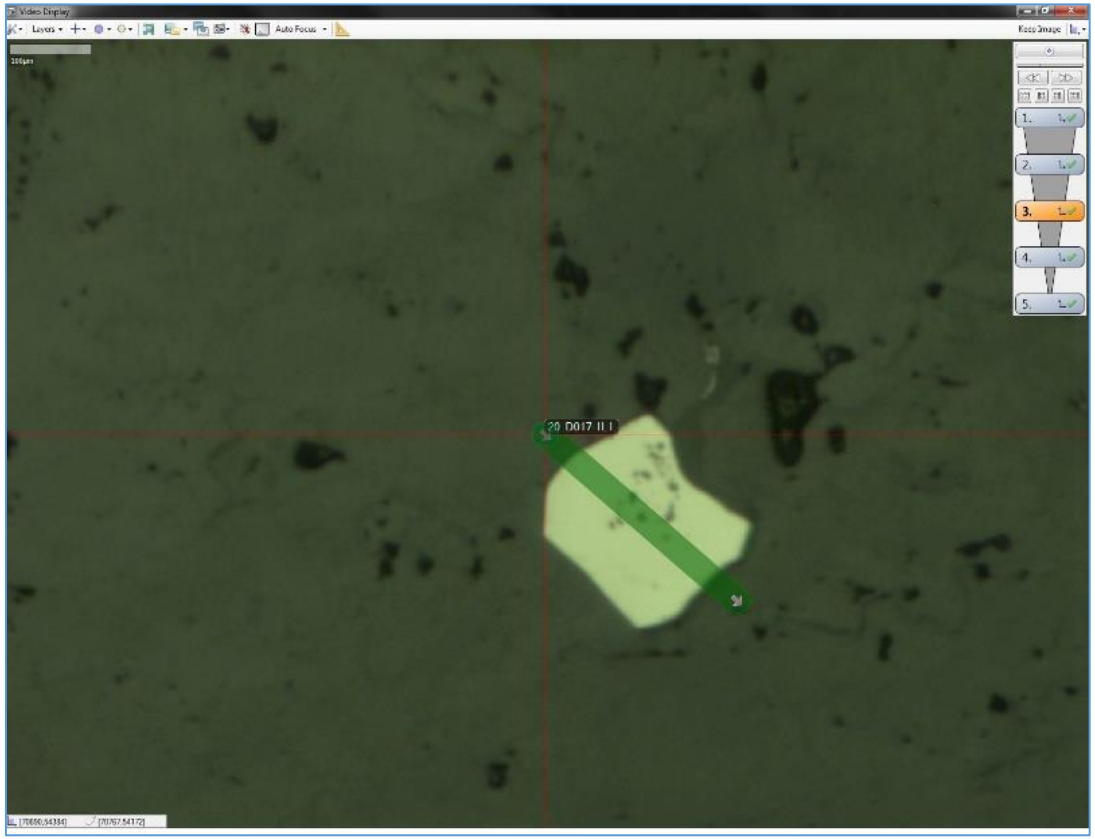
# Signature syénitique des dykes



# Analyse des pyrites par LA-ICP-MS

Pyrite dans les dykes (10 échantillons n=77)

Pyrite dans les encaissants pyritisés et altérés (7 échantillons n=51)



# Exemples de dykes de syénite

D001 D017 D022


5 cm

# Exemples des encaissants

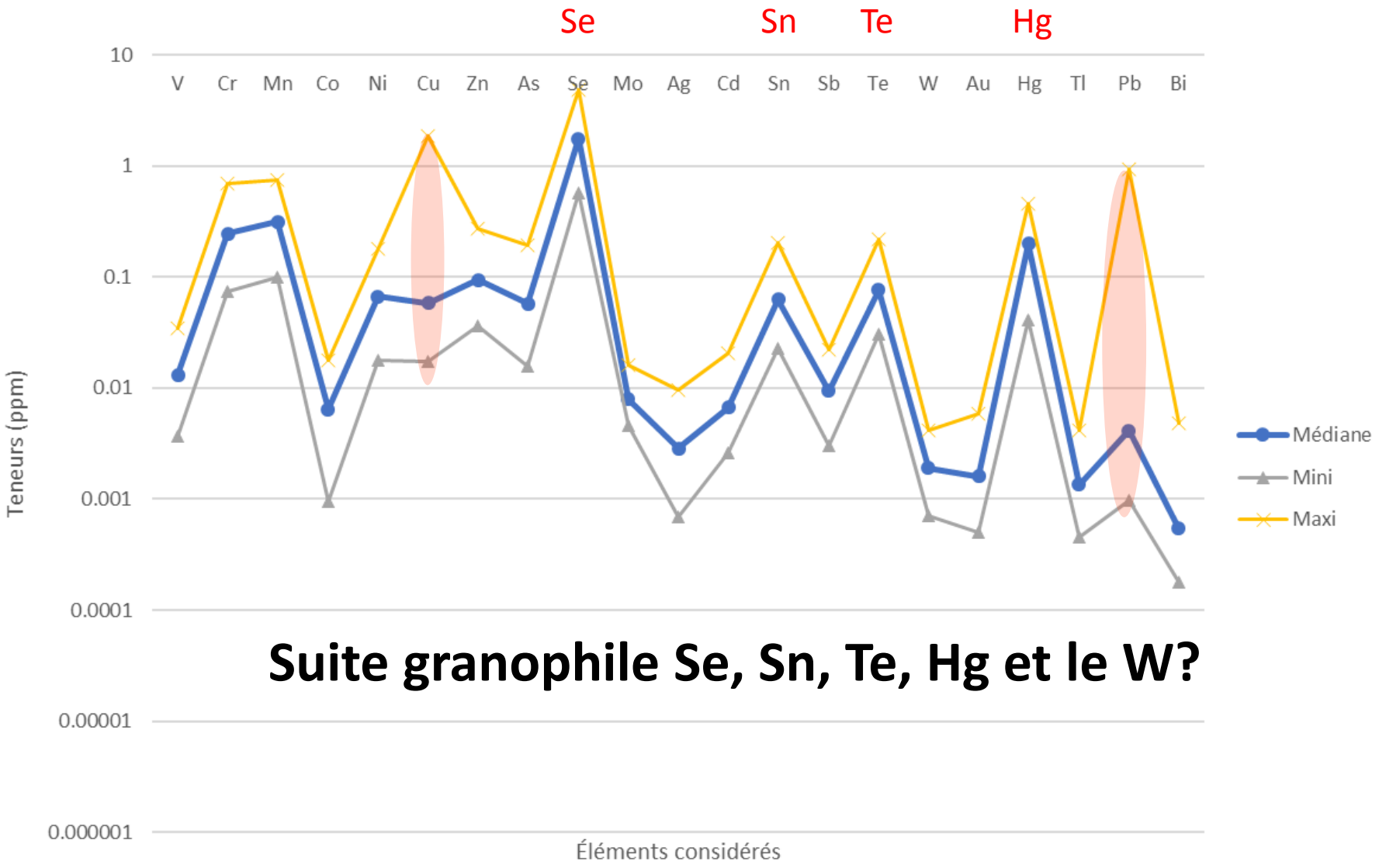
D009

D011

D004

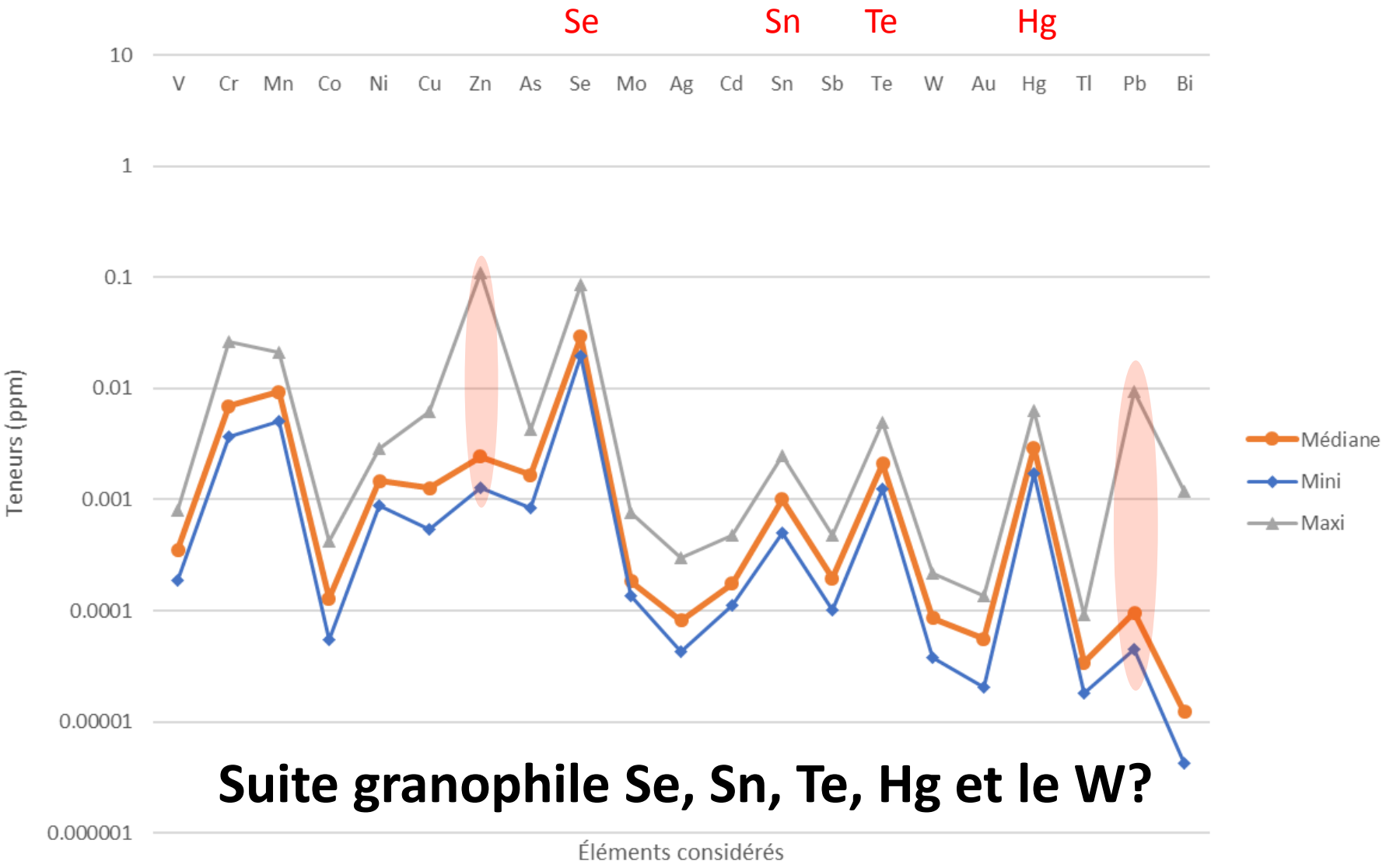
5 cm

# Valeurs analytiques des pyrites dykes de syénite



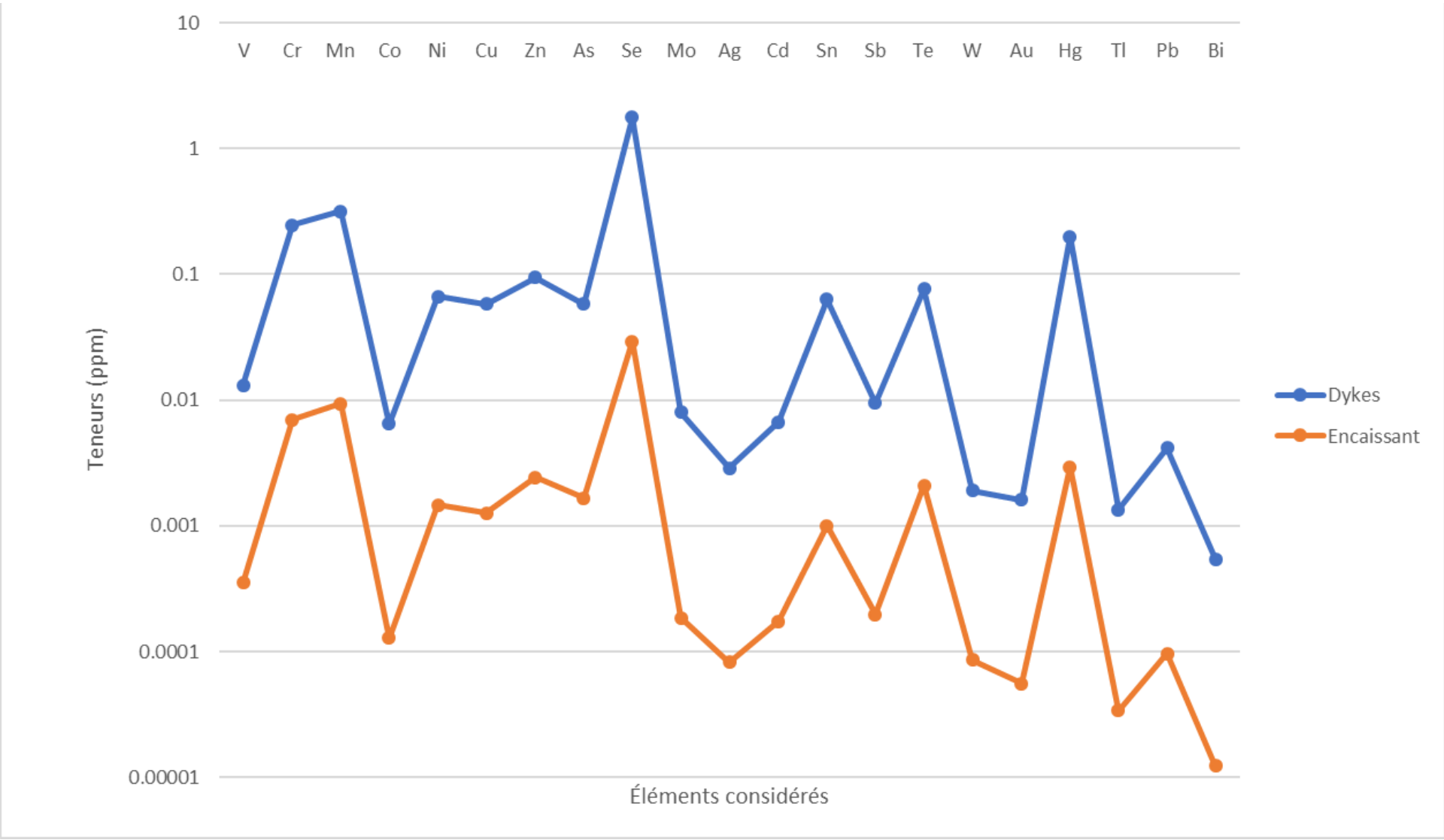

## Suite granophile Se, Sn, Te, Hg et le W?

# Valeurs analytiques des pyrites des encaissants

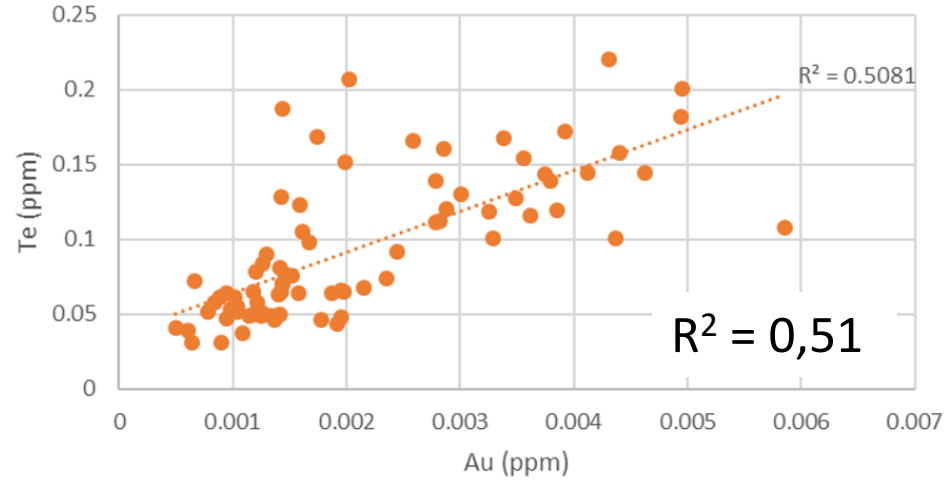


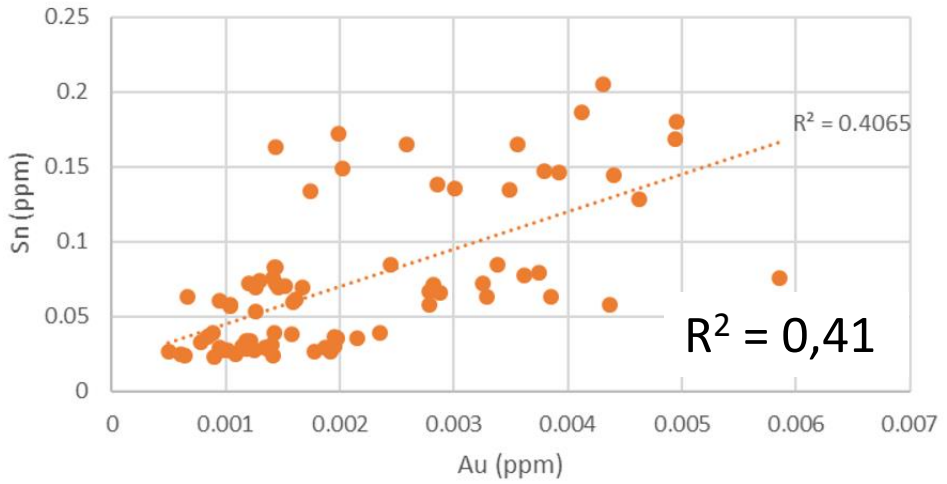

## Suite granophile Se, Sn, Te, Hg et le W?

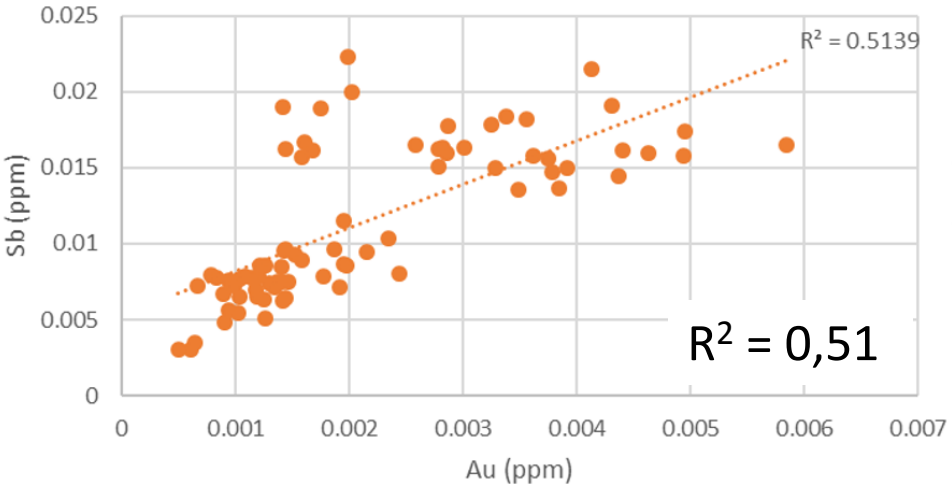
# Même signature diluée = même système hydrothermal

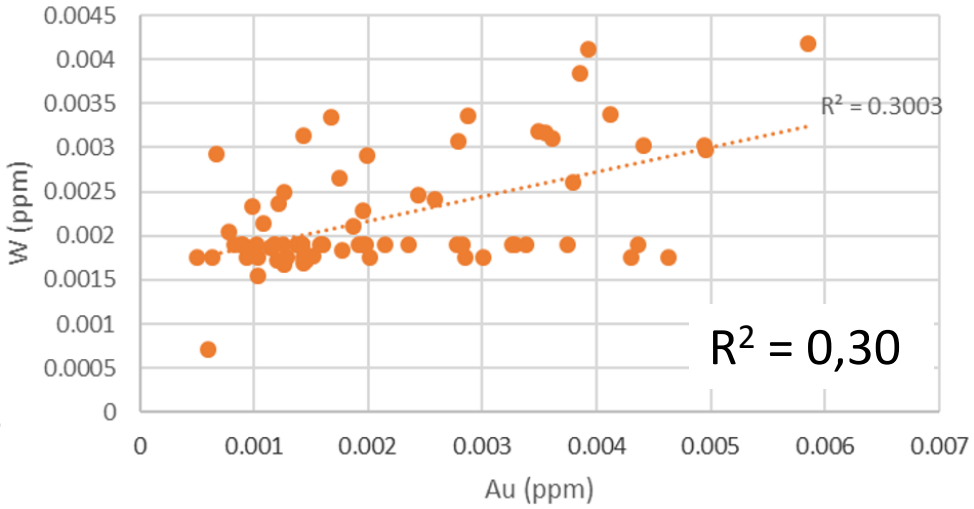


# Corrélations métaux granophiles avec Au

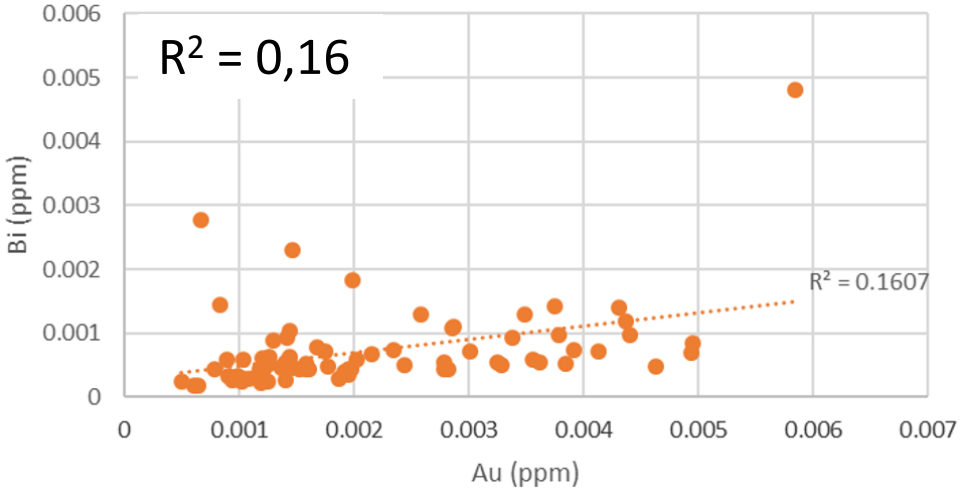


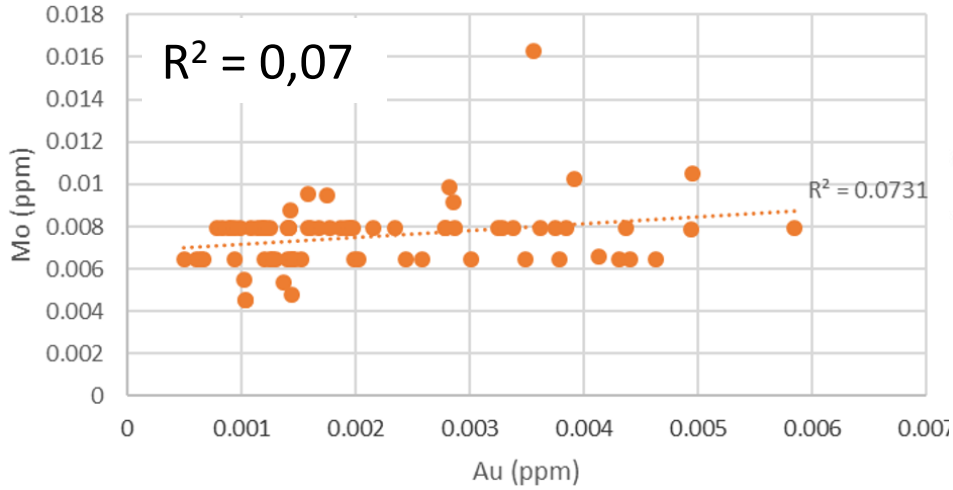
# Corrélations métaux granophiles avec Au

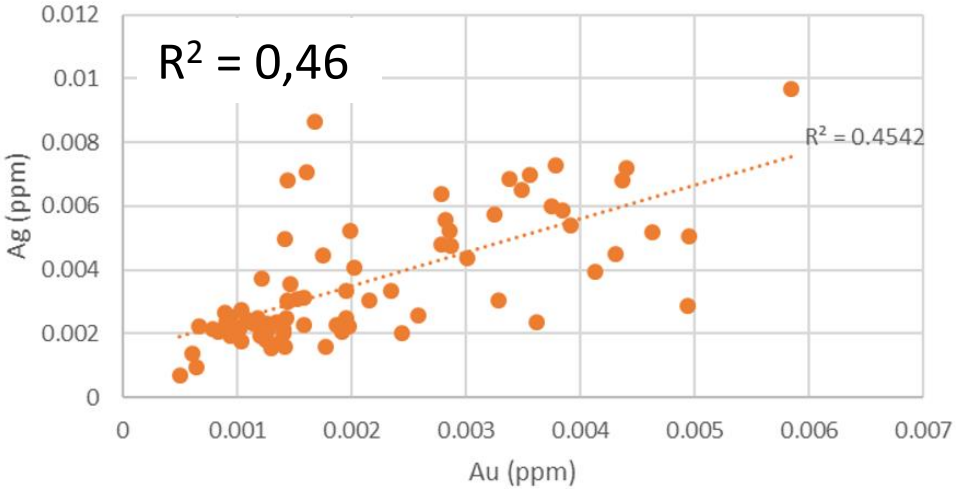



Signature magmatique

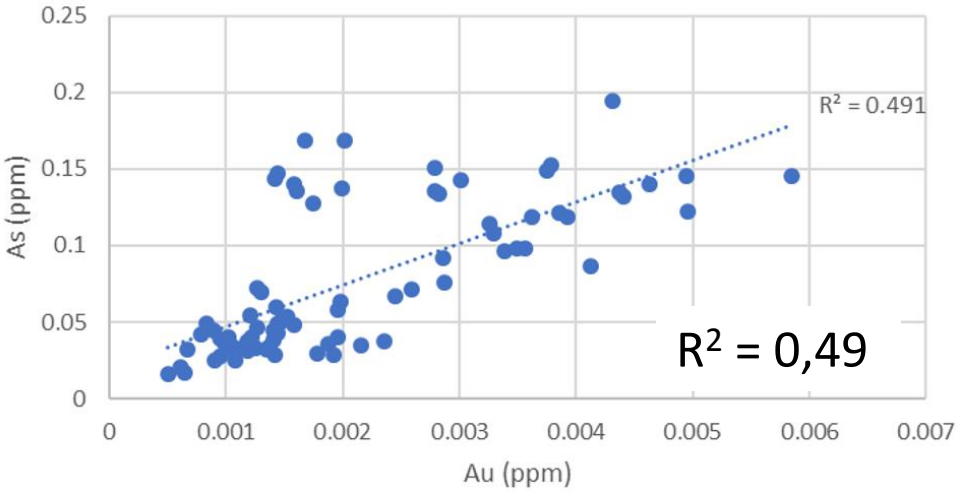
Te, Sb, Ag, Sn, W ± Bi - Mo

Au = Ag



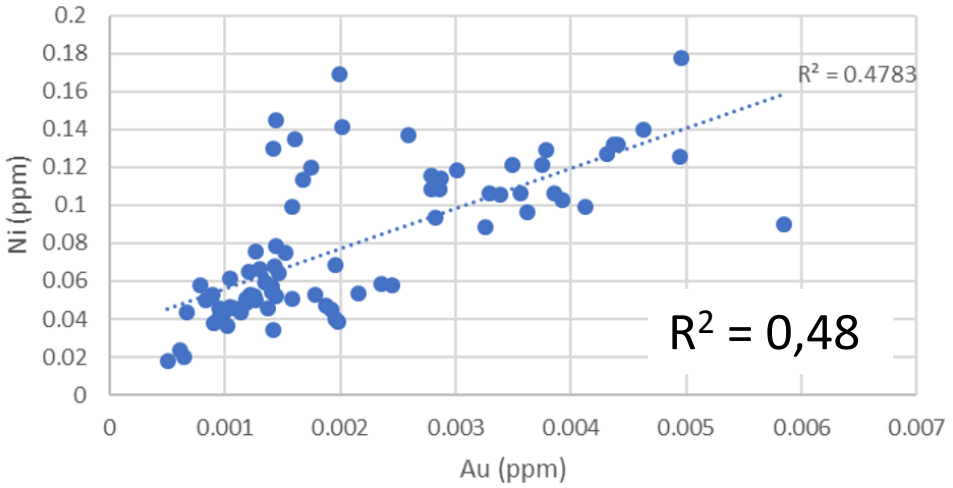
# Corrélations métaux typiques fluides métamorphiques

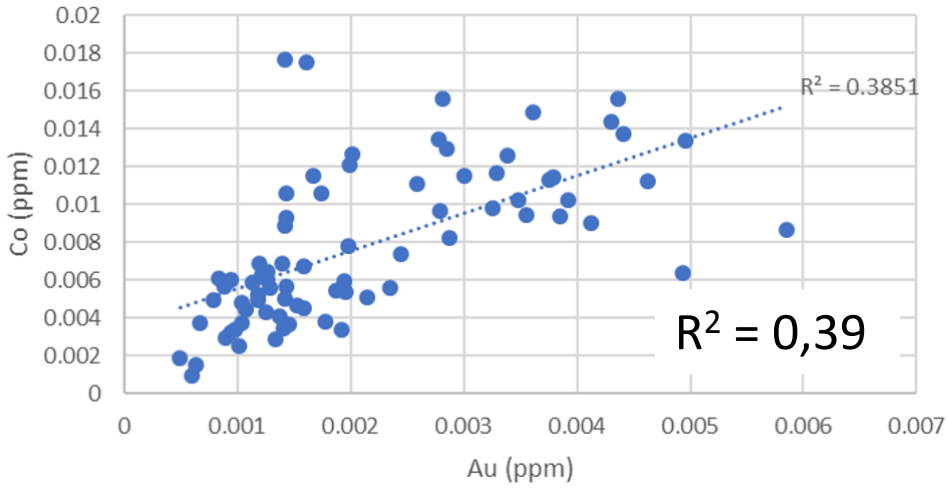



**As, Ni, Co = typique système orogénique**

Deux sources:

**Magmatique - métamorphique**



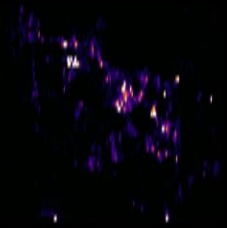



# Cartographie au LA-ICP-MS d'une pyrite

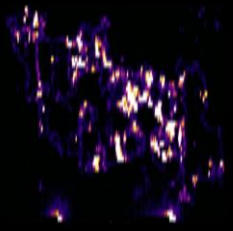
1 mm

S

Au

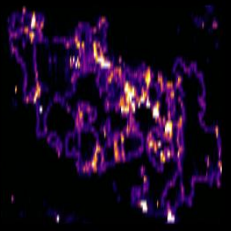


Ag

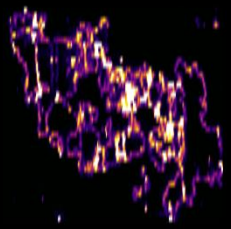


Granophile

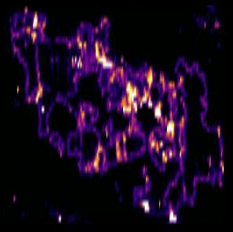
Te



Bi

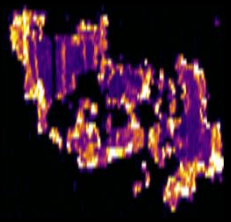


Sn

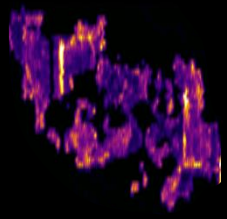


Métamorphique

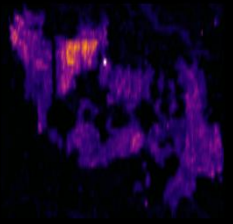
As



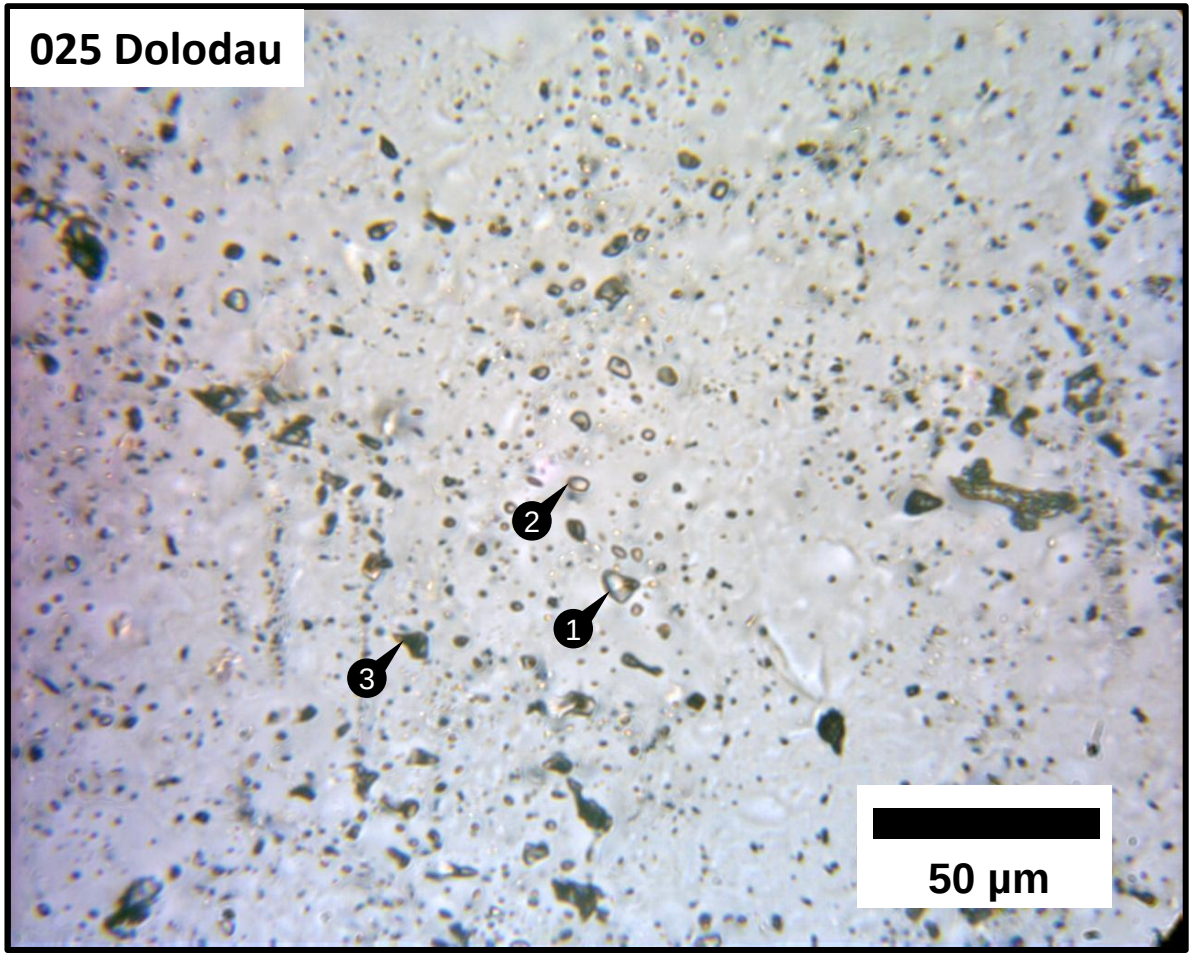
Co

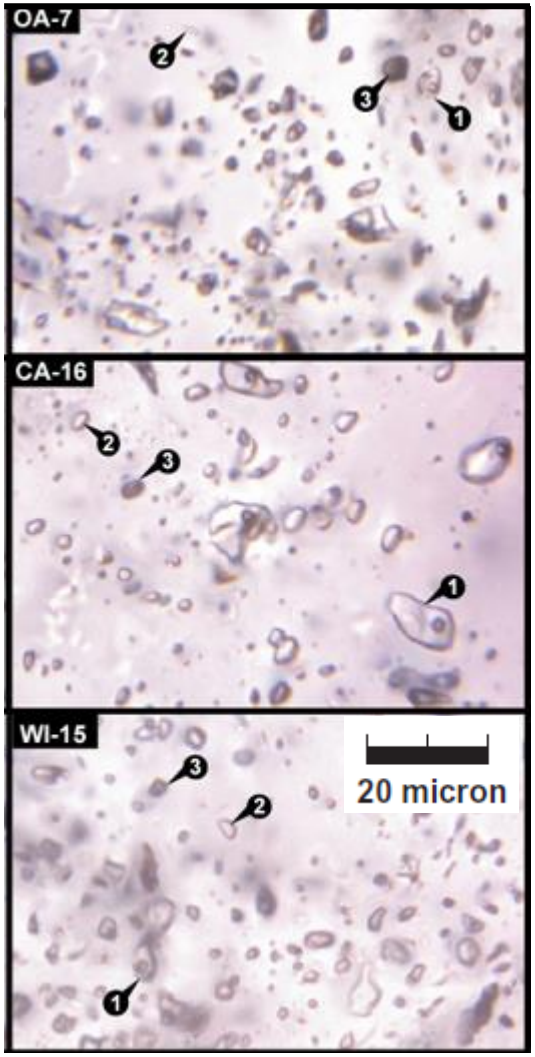


Ni



# Et les fluides hydrothermaux alors ?



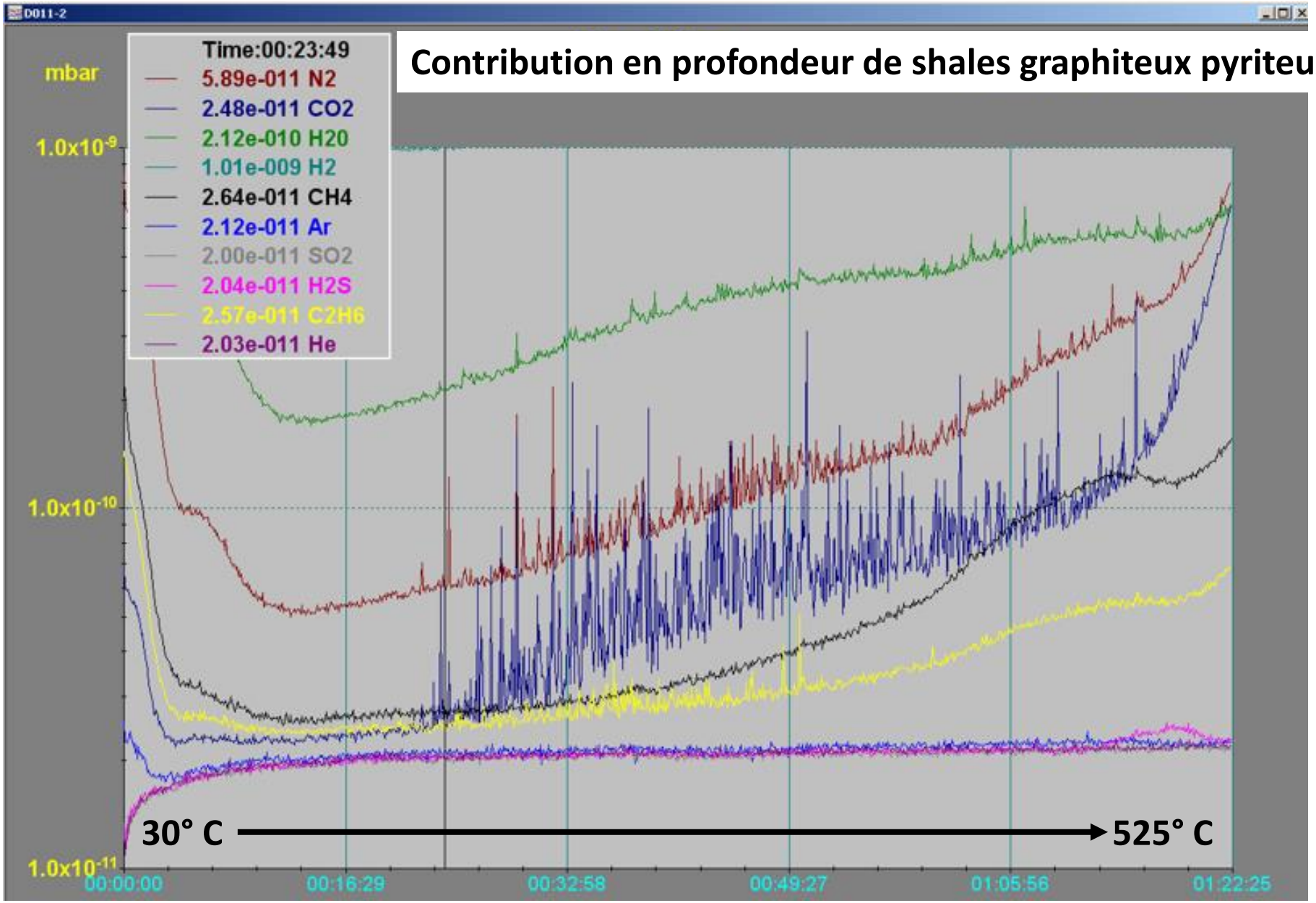




1. 2 phases liquide-vapeur 10-15% vol. de la bulle
2. 1 phase liquide transparent
3. 1 phase vapeur foncé

LAMEQ
LABORATOIRE DE MÉTALLOGÉNIE EXPÉRIMENTALE ET QUANTITATIVE

Schistes d'Otago, N-Z
100 Ma

# Signature $CO_2$ - $N_2$ - $C_2H_6$ et trace $H_2O$



# À Chapais: Indian Lake > 100 m de shales graphitique pyriteux

# Conclusions

Au associé avec Te, Sb, Ag, Sn, W ± Bi – Mo: **Magmatique**

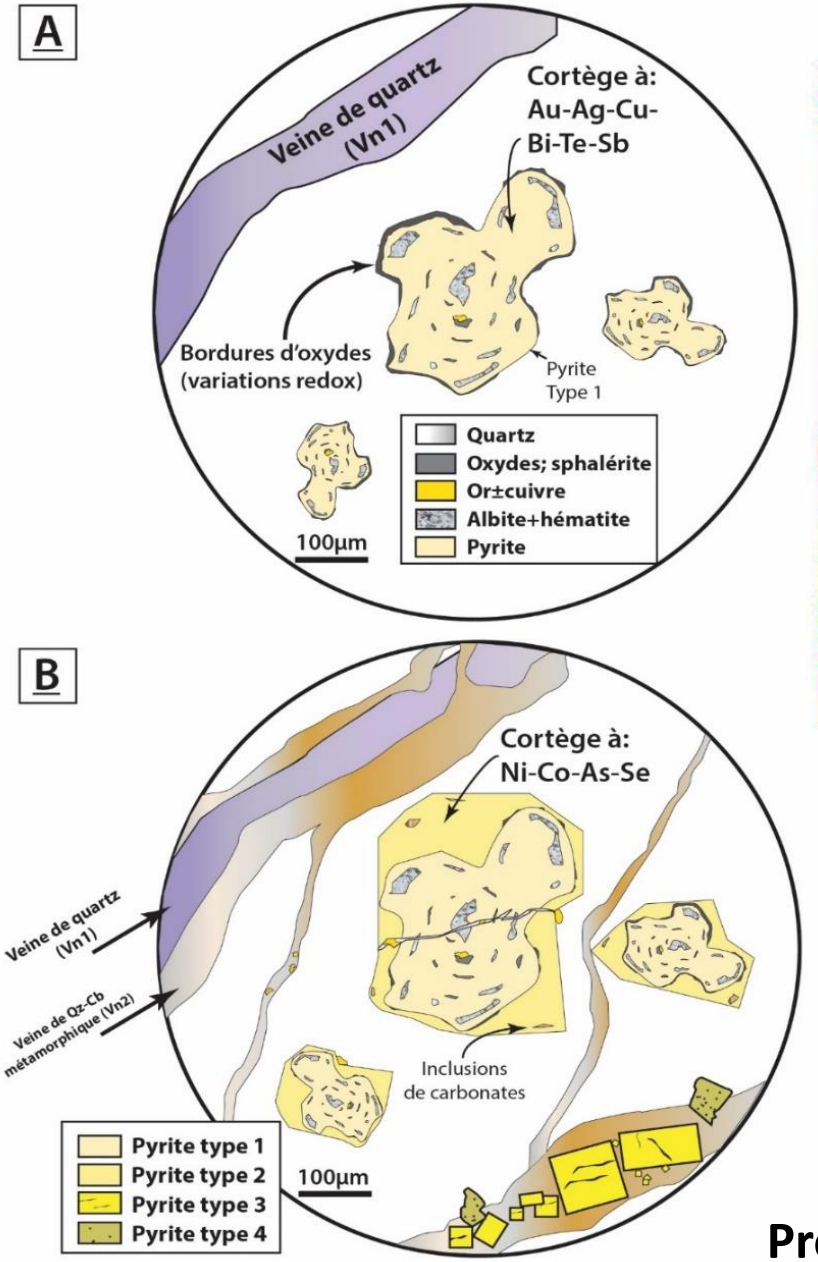
Au associé avec As, Ni, Co : **Métamorphique**

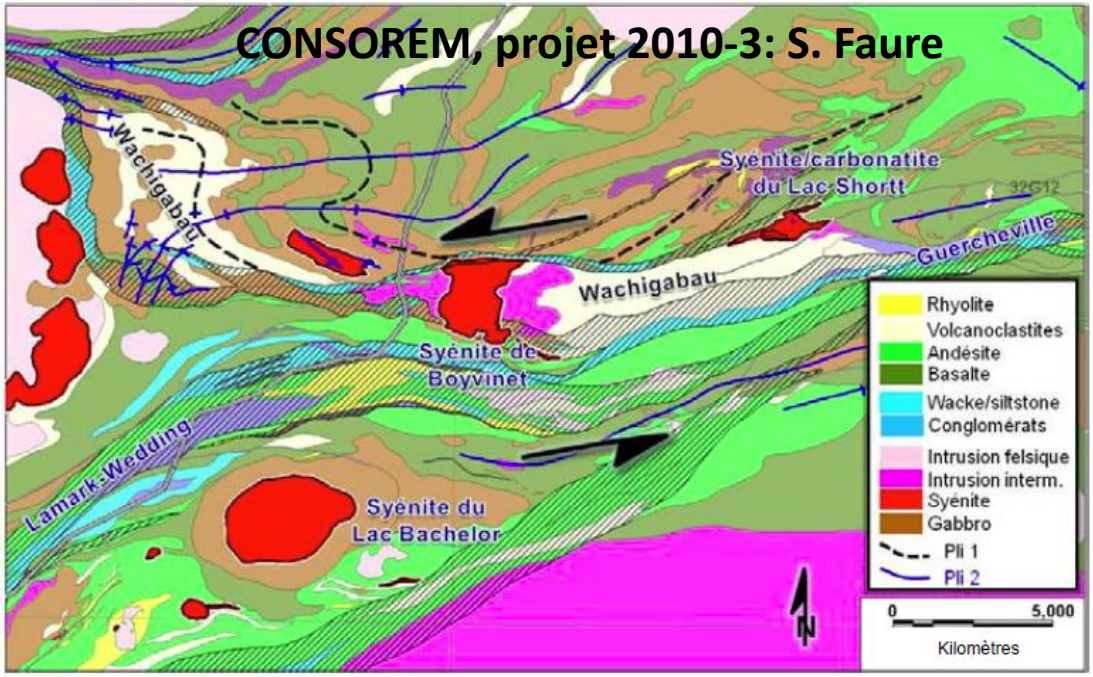
Fluides hydrothermaux : **Métamorphique**

2 systèmes hydrothermaux superposés

Cohérent avec le synchronisme « cisaillement – syénites »

# Est-commun ? Est-ce nouveau ?




SOQUEM

**Projet Boyvinet - MSc Edouard Côté-Lavoie, 2016**

# Multi-stage: concept à la mode

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/oregeorev

## Multi-stage enrichment processes for large gold-bearing ore deposits

Sebastien Meffre [a,*], Ross R. Large [a], Jeffrey A. Steadman [a], Daniel D. Gregory [a], Aleksandr S. Stepanov [a], Vadim S. Kamenetsky [a], Kathy Ehrig [b], Robert J. Scott [a]

[a] ARC Centre of Excellence in Ore Deposits (CODES), University of Tasmania, Private Bag 79, Hobart, Tasmania 7001, Australia
[b] BHP-Billiton, GPO Box 1777, Adelaide, South Australia 5001, Australia

Miner Deposita
DOI 10.1007/s00126-013-0466-3

ARTICLE

2013

## Multistage gold mineralization at the Lapa mine, Abitibi Subprovince: insights into auriferous hydrothermal and metasomatic processes in the Cadillac–Larder Lake Fault Zone

M. Simard · D. Gaboury · R. Daigneault · P. Mercier-Langevin

# Merci

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